BRAIN HYPOTHESES
and
THEIR BROADER IMPLICATIONS

Pat Gunkel

(A)

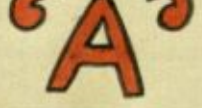
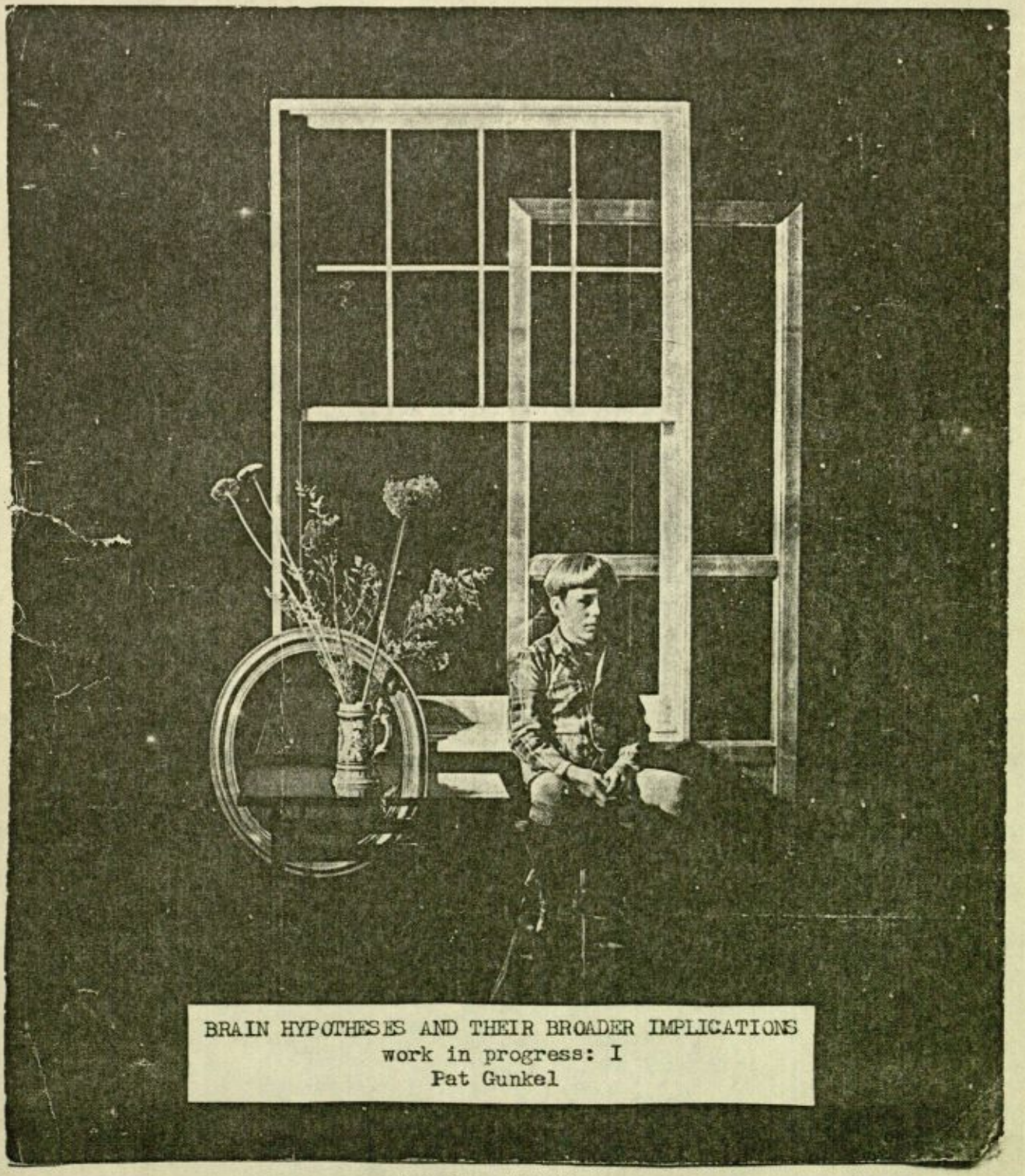


Table of Contents (Papers) For Patrick Gunkel's Book "BRAIN HYPOTHESES AND THEIR BROADER IMPLICATIONS": (1972-1974)



BRAIN HYPOTHESES AND THEIR BROADER IMPLICATIONS
work in progress: I
Pat Gunkel

1972-1974

Part I: Introduction

VALUE OF THE BOOK
Pat Gunkel

About ½ of what I wrote on the brain has been typed. The other ½ is in notes and for the most part requires no rewriting but simply has not been typed, representing ideas not contained in that already typed (save for development), distinct methods of presentation, perhaps something of the inseperable 'case' for the foregoing, and arbitrarily absent from the typescript. These would add to something over 1,000 pages of single-spaced typing. The book is called Brain Hypotheses and Their Broader Implications, but the part of the book representing the second half of the title, the implications, has never been written, although a large part of it is implicit in the hard hypotheses and exists in my head or, in nutshells, in that of the book written. Because the book or body of work is so unusual, and because I have not pushed the book with any publisher nor submitted any part nor distillation to a journal, it has sofar gone unobserved and unused by the scientific community. I suspect this is a real tragedy based on my own expectation of the book's importance. I would like, were it possible, to remedy the situation. Toward this, I list the various values of the book as I see them, mostly without assigning them any relative or absolute importance or making their individual cases. I merely want, in one way, to introduce the reader to the book.

1. Mostly absent in the typescript is a list of all the terms in neuroscience I encountered and recorded as the first step in making an exhaustive dictionary of the subject which no one has sofar done, even though one of the most important things in a science is that its terms and concepts be gathered together, defined, and systematized.
2. Basically the inception and foundation of a theoretical neuroscience including ia a systematization of past ideas, an effort at their synthesis, a setting forth of preliminary ideas, a consideration and establishment of goals, means, problems, directions, orders, &c, a definition and delimitation of the field, a treatment of premises, a treatment of standards, a criticism of present progress, the seperation of theories and hypotheses, a discussion of frameworks of relevant experiments, a presentation of working theories, a recasting of vocabulary, a schedule for accomplishments, &/or the like.
3. Argument and evidence for attention to an agnosiology, ie serious and systematic dual treatment of our ignorance about brain and mind. Specifically, measures of our ignorance in various fields and matters.
4. Criticism of the authority, relevance, importance, suppositions, perfection, completeness, style, methodology, implications, understanding, independence, authenticity, theory, vitality, certainty, generality, &c of past, present, and future work. Suggested corrections and provisions.
5. Exhibition of the exemplary and particular real complexity of subjects, ideas, things, &c; presentation of typical spectra of ideas and, from these, of the dimensions, dimensionality, and structure of ideas generally. One reason for and effect of this is to impugn much of the manner and matter of current research, which is apparently given to immense, fatal, unrealized, and unanalyzed oversimplifications. Argument that this inherent complexity speciously or innocuously faults many negative, bothersome, and mysterious finds. First recognition, presentation, and analysis of the most important spectra. Argument that in real nervous systems these distinctions and mechanisms may coexist and possibly, but only possibly, cooperate.

6. Shows something, and by attempt all, of the structure of neuroscience, eg by setting forth the interconnexion of concepts, the ideal and actual branching of spectra of ideas, the overall rivers of possibility.
7. Purposes of neuroscience and their importances are given and distinguished from those of the past.
8. Attempts are made to blueprint the manufacturing of mechanical beings: what we should do, what we must know, what class of minds can exist that do not exist in nature, how natural minds could be extended, what can be done now, why must it be done, &c.
9. A program for determining what makes man more than animals is given and a comprehensive description of possible and probable neuroevolutionary changes is begun.
10. Methods for the simultaneous and usable presentation and effective condensation of present knowledge are given, including the beginnings of an exhaustive neurographic atlas.
11. Innumerable novel concepts of the neurology of emotion, thought, memory, action, purpose, development, perception, &c are created.
12. There is an attempt to develop simultaneously ideas that are superficially or in fact contradictory.
13. Many old and new ideas of the design and function of the cerebellum, hippocampus, cerebrocortex, basal ganglia, reticular formation, brainstem, general structures, cell column, cells, &c are simultaneously set forth and compared.
14. Re #11, attempts to give 'adequate' and 'comprehensive' treatments of these are made.
15. The order of the world is treated as an important subject in itself, hitherto neglected.
16. Computers and brains are distinguished.
17. The dimensions of the electrophysiology of lone neurons are defined.
18. An attempt is made to exhaust the typology and structure of neurons.
19. Some of the broad, philosophic consequences of my ideas are given.
20. Various new and important experiments are suggested.
21. Some nonmathematical theory of electroencephalography is given.
22. New theories of human psychology and epistemology are given.
23. There is a massive analysis of possible bases for vision.
24. The book causes one to think persistently and deeply about the theoretical side of neuroscientific data. It is intended to trigger the sudden growth of world theoretical neuroscience. It is intended to 'seed' neuroscience with a plethora of ideas that these be developed by others and tested in their work. It is intended to cause neuroscientists to look at all sides of matters in a 'topological' fashion. It is intended to improve the originality of neuroscience. It is intended to begin at this time the formulation of comprehensive theories of nervous systems and minds. It is intended to cause neuroscience to assume a new importance. It has many other purposes.

COMMENT ON THE THEORY BEHIND THE WRITING OF THIS BOOK
Pat Gunkel

This book obviously displays considerable density, obscurity, and novelty of language and thought. Everyone objects to this and supposes it a "mistake". Everyone, that is, but myself. I intentionally chose, in this book and in my life, to spend all my energy on exact, true, progressive, and beautiful thinking and my own intuition of what I would be doing. I believed that I should try to maximize my control over effect. These things because in everyone's life and in society's there are moments, such as James Joyce's "epiphanies", of transcendent enlightenment so important that despite their fewness or even uniquity they are equal to or greater than all the signifigance, clarity, and labor of the intervening or preceding intervals, the conventional styles and ideas, the conventional notions about human capacity, and all or an infinity of triviality; and there are standards; and in today's society and all of history one sees the problem that standards are lowered, standards of exertion, belief, &c to arbitrary or infinitesimal points, whereas, taking "exertion" as the example, exertion leads to later ease, memorization aids memorization and is the basis of subsequent thought, &c so that how much better and temporarily infinite it would be if everyone aggraded standards to bootstrap themselves to true optimal standards; so that I decided to raise standards; and I realized that, properly done, writing and thought intense in the seeming flaws listed above, could occasionally or abstractly break through and be seen with such strength of emotion and deciding confidence that all its opacity, density, and oddity would vanish into a strong cognizance of what was meant and a warm and justified appreciation.

My ideas and wording combine. These combinations, seen and attended to, drastically and finally simplify what is before you, what is spun out of them; and these combinations are the basic prejudices of all previous writing and thought by other men, the important general things, to whose revolutionary address I put this book, to tear the skirt from off these things and to open the skies of all possibilities, not secreted and dumb fractions lying pointlessly here and there upon a field of cowdung. The power of these combinations is either the power of combination by which the brain's description or anticipatory intercumbent alternatives.

(e.d.: Did I omit something here, e.g. for having been in a sudden hurry, had a phone call to answer, had a distracting thought, through utter weariness before retiring to bed? Or is a correcture in the original invisible in this copy?

But after carefully rereading the final sentence, and based on my knowledge of my style (at points in my taste) at the time this was written, I have realized that it may well appear here exactly as I intended it. In fact, I think that that is almost certainly what is the case.

In effect, or as just one possible interpretation, substitute: "a combination through which the brain's complete description can only be achieved, or that is unavoidably necessary in our present ignorance about the brain — as a seemingly but not actually excessive way of hinting at the indescribably complex structure of natural alternatives that our ignorance makes real, simple, & meaningful up until the very instant that (partial or generic) our ignorance is vanquished, but an instant after absurd."

INTRODUCTION
Pat Gunkel

This is an extremely strange book and it faces an uphill battle in getting read, accepted, and understood. It may seem otherwise to some, but the truth is that I did not consciously try to make it difficult, on the contrary, but I did follow the policy of being indifferent to the difficulties of communication and at least conventional aesthetics as I thought and wrote the thing, so that my thought would be as mercurial (free, reaching, instantaneous, isoporic, &c) as possible. In fact this is more of a problem than appears at first sight for much of the book and generally 'the best ideas' operating at a certain level of abstraction (and empirical connexion) must necessarily in writing, and extremely a fortiori in my case, go unrecorded: by far the most and best part of this book are lost thoughts and completely unavailable to the reader who is and was not myself. This is something of what is meant by the intuitive type. Often inspirations must later, if ever, be laboriously justified. There are many of the peculiarities of this book for which I feel there need be no justification, although they may certainly be unconventional. Eg the poet is a thinker whose mysterious and highly abstract insights certainly have no need of annotation, but who can arrive, sometimes specifically by the use of incommunicative means (which however are beautiful and thus "artistic" manifestations) such as metaphoric steppingstones that float in space or as smoky metaphors that incomprehensibly formed, complex, and turned and yet convey (again perhaps secondarily) incomparable delight; if the dominant theories of this book are correct, such subtleties of ghostlike thought are man in his highest and true type, the agency behind the grosser works that settle as the deceptive dregs of untraceable, unimaginably subtle, heavenward thought. It is enough that we can have the fruits of such thought and the larger patterns that drift away from it, to be followed only by thought of identical kind, rather than to mimic (per tradition) the gross, preposterous, and feeble irrelevances that remain. The death of the spirit of man and of science (in its essential form) are what is seen when ghostly thought is thrown aside as vague.

This book is an altar to that thought.

The poet in history was often an adviser to kings, and to whom does one go to understand the meaning of life but the poet? The poet is concerned with the flight of things and the image of the world is alate. It is the expanse, complexity, and specificity of the world that is the source, the reference, and the terminus of ideas or the real form of things for things in their meaningful essence are inextractable from experience in its entirety; yet experience is ever incomplete and the things that fall within this truncated experience are arrows that point to horizons infinitely distant that cannot be brought within the present as parts thereof, so that the poet is merely concerned with the vastest intercomparison of these arrows and what he utters thereupon cannot be rewritten else it will point elsewhere, perhaps nowhere, and earn destruction. Who would contain lightning in a glass case, count the sand upon the shore, or sculpture a river? Ah, many! But a little girl is her own lesson, too profound and too trivial to be otherwise.

CONTENTS:

BOOK

SOME RECENT WORK ON THE BRAIN

Pat Gunkel

1. WRAdey & episynaptic extracellular fields; 1500 sq micra, 10^{7-8} prot & 10^{9} lipid.
2. HSBennett & glycocalyces.
3. ESR mobiles eg in hydrophobic regions; carriers.
4. Cytodes--sites, paths, behavior.
5. EM intramembrane fibrils.
6. HHChang & ohmic spinal cartridge; horsetail long-horizontal basket, double-bouquet.
7. Endogenous subthreshold rhythms.
8. VBBrooks & cat motorsensory cortex: extero, proprio, teloceptive (hairbending, touch, tap, pressure); 75/25 local/wide; 28/10 cell/muscle; ef/afferents -.5mm & interneurons -1mm columns; successively shifting overlap; cortic reflexes & such; cortex self-connective; verniers--feedforward afference & intra/subcortic loops, sharpening & anticonvulsant; tactile placing/grasping; PT; high cells specific; inhibitory PT cell collaterals; titration.
9. VBMountcastle's intactness & linearity; convergence-divergence; inhibitory/excitory profiles, narrow channeling; lemniscal v spinothalamic; form, contour, locus, intensity, temporal movement.
10. Labile v unchanging conditionable gradient.
11. Krieg chart backflap.
12. TGRBower: size constancy, shape constancy, instant disappearance, continuation, proximity, heterogeneous summation; space but not pattern perception; quantive v qualitive change; 10-14 wks begins pattern recognition.
13. YKatsuki: cat; flat, multipeak, sharp-peak, high-threshold irregular, low-threshold broad, large percentages, different latencies; mixed tho statistically regular; WRichards tristereopsy; flat fast-adapting v multipeak slow; flat best several tonal frequency spectra simultaneously; temporal funneling.
14. KLChow 10% plasticity: LGD, 19, HC, T, RF, other specific thalamic nuclei.
15. DNSpinelli's CR parallel addressable primosensory string-memories; match-cells; adm.
16. OSVinogradova et al & HC (multimodal, diffuse, tonic in dorsal; more multisynaptic in ventral) (close to orienting reflex parameters & presumably involved inhibition of RF), mammillary phasic & stimulus-bound; different sensory trace phenomena: tonic reactions with long aftereffects, different types of habituation, & conditioned time-dependent effects (extrapolation, reproduction of stimulus duration, perseverance of the reaction pattern in background activity).
17. ERJohn stimulus generalization bar press-shock avoidance flick 4c/10c playback & differentiation.
18. Mirror-fcci, conditioning help; after several weeks continuous 6c autonomous in bursts.
19. KLChow conditions LGD: spot-flash, ~~xixkxpixix~~ nonlinear modification.
20. FMorrell conditions al9 cells, paired-trial, shock, click, visual; JClds & HC.
21. GAVardapetyan & cat auditory: classification by stability 36% stable, 29% extremely unstable (15% increase 14% down), effect of duration on latency, ceilings,
22. Role of protein.
23. Caudate association, diffuse projection, corticoid topography.
24. Reinforcement recruitment neuronal #.
25. Complex sensory paradoxic amygdala basolateral cells.
26. SWollberg & JNewman as deletion & simplicity/complexity.
27. CGGross et al: just visual, most respond increasingly, fields TE 145-409-14,410°spont OA 14-69140°; all foveal; fields cross midline & even just ipsi, more bilateral, all more to moving stimulus mean best 5-7°/sec, 71% light/69% dark, fewvto certain size square or circle but most ~~10~~ 1° slit, checkerboards, complex colored patterns (eg tree & face photos), weak to diffuse light flash; hand (show); bidirection & divergence; not to just same dimensions for objects; 3D object; orthogonal for movement & parallel; colored; combination; eeg; speculate on other areas.

A First Spurt of Neuroscientific Questions

Pat Gunkel

1. What's the exact 'structure' of membranes that suggests mental specificity?
2. Elephantic & some cetacean brains being many times the size of man's, what is the full & decisive set of terms of comparison, eg cortic layer #, convolution & total cerebrocortic surface, myelography, aprojective association area, chemotopography, sensory/motor ratio, lobation, general novelties & idiosyncrasies, diencephalon/telencephalon ratio, limbic development, progression of human recessives, pallial macroscopic/perikaryal depth, iso/allocortex ratio, oligodendroglia nature, electrography (EEG & stimular mapping), ratios of different sensory areas, somnal, neuron types & numbers & structure & microcircuitry & distribution & chemistry & activity & identity & development, progression of human progressives, biochemistry, &c? Is there anything neurologic contraindicating transhuman intelligence? Is there anything technologic that might be done to compensate for some disadvantages (eg tractographic)? If insects can be made into dandy microcomputers, can giant brains become macrocomputers? (N. Other technologic compensations might be sensory, motor, educative schedules & setups & psychogeneses, drugs, cyborgal (eg brain explantation), neurostimulation to override customary & encourage novel behavior, &c).
3. Just how are the 'sensory' & 'association' areas connected? It seems very important to determine the general & complete fibrodromic architecture, incl the subcorticly mediated circuits. A transparent 3D map should be made. In fact, it is in general extremely important that comprehensive all-describing ingenious graphics should be made. Just as there exists no & no perfect dictionary, few & no perfect synthetic representational aids exist, impeding the progress & popularity of neurology. Should a real compresent model be difficult, the static & dynamic sum of knowledge could be encomputered for perspectival & serial manipulation, & even exploratory simulation. Axon & sheath thickness could also index velocity, & would be important in discriminating functional association. This is macroneuroanatomy & should be fully describable soon & before either complete or sufficient mesoneuroanatomy (cell neighborhoods); perhaps complete micronic multimicrotomy--1o5 steps done at ultrahigh speed, tridimensionalized, averaged over specimens for textural reproduction, perhaps done at high cost but uniquely--could provide the definitive exemplary cephaloaxonography, in which case, further macrography would be functional, eg diffuse multisynaptic & holar multicyclic.
4. Just to what do the association areas run en route all the way out?
5. Are the hypercomplex fields et al hereditary? Are the Hubel columns? How difficult will it be to distinquish the fact, degree, physioanatomy, structure, & content of neurons? How much information can a neuron store, how can this be tested by installation, is this identical with its natural store, what is the dissimilarity, how efficient are neurons, what intraneuronal (eg gemmal, vesicular, neurofibrillar, membranous, ephaptic, Nissl corpuscular, hillock, reticular, molecular specific, polysaccharide chain ephaptic, &c) destruction varies--directly or indirectly--the information (what methods of selective intral--eg intral-extral--destruction may there be), how does this informability develop in biogeny (eg relative metastability, predetermination, response complexity & range & flexibility & causality & number &c), how do these neurons interact, how does the interaction correspond to mentation, how do the presumably inborn responses or patterns change thru time (eg deliquescently, posi-

tively, cyclicly, stagedly), are innate or developed conidioneuronal fields the rule in other or all of the brain (eg may associational neurons be tested for same), how are the idioresponses 'reached' thru the cell structure, how 'pure' is monocellular conditioning & deconditioning, may the presumably innate conidioneuronal fields be alphabetic & their individual or group settings be to some (determinable) degree thematicly conditionable (thereby providing a measure & a concept in psychic heredity), may the innate & developed presumed cell responses be variously obliterable sans necrobiosis (with what overt consequences), are & then how are neurons arbitrarily conditionable (there may be some hill to cross irremeably), are only some isoareal neurons iso- or coenopatterned (are these traditional cells precipitative), are the processing cells in various sensorimotor areas roughly isoalphabetic (there are many ways of answering this question, eg re spatiotemporal isomorphic synesthesia, &c), are early animalian & prerhombencephalic neurons responsively isocomplex with cephalic & neopallial neurons, are neopallial neurons responsively more fixed & informed than more caudad neurons or vv, how do peculiar intracellular biorhythms affect responsivity & sensitivity, how do dendrites & the like quantitatively & qualitatively reflect idioresponses (eg inversely or reciprocally), with what formulae do cells synchronize or nonsynchronize (how does the infinite set of rhythms vary thru life time), to what degree are synaptic topology & dendritic orientation dependable inexperientially (innate & developing despite total postnatal sensory deprivation), what are the asotropic characteristics of cortices in detail & in examples, &c?

6. Have more than 6 'levels' been found? How are these arranged? Where is the 7th level, what is its boundary?

7. Has someone surgicly rearranged the cortex? This is a very interesting question, & besides incl varieties of autograft, includes isografts, homografts, & heterografts; the varieties: horizontal rotation & substitution, vertical inversion & substitution, oligocellular transplantation, gross or 'elegant' reconstruction, incl artificial cytoarchitectures & myeloarchitectures, in situ inversion of isolated cells, glia transplantation, all kinds of mixtures & messes, layer rearrangement, axon suture, dendrite transplant, insertion of hundreds or thousands of manmade 'microtubules' for chemical dispensation & even even filter-selective drainage into the cellular matrix, grafts of young cells & tissues & structure, transplantation of cells & structures & molecues from old into young (eg mostly segmental structures), transplantive duplication of structures (eg mostly segmental), white rewiring (incl fiber multiplication, neolocalization, artificial wires, new loops, size alteration), stacks of inverted slices or neuron (eg layer) randomization, vertical & horizontal incremental & maximal & 'elegant' additions (incl the attempt to build a bigger & better brain). If there is some degree of rejection & abnormality, what are their mechanisms, are the mechanisms independent, are they suppressible, avoidable, or preventable?

8. Is the local neuronal circuitry unitary &/or repetitive?

9. Is there a way sofar of stimulating dendrite growth?

10. What quantitative or qualitative evidence supports the individuality of neurons?

11. What functions may, in theory or fact, be ascribed the gemmae?

12. Have variations on Penfield's results been done, eg micro, multi, mapping (what kind), repetition, repetition related to stimulus nature (r, q, duration, sign, static variation, sequence or complexity, dynamic variation, sign variation, &c), depth, position, interiority, &c? How bounded these areas, what's boundary nature, esp on circuital extremes; what's set of other connections (in/out), what's structurally peculiar to cortex, how do these citations affect EEG; conversely, does voluntary recall by the person produce special electric activity of the stimulated area?

13. Is there evidence of various circumcortic & microcortic loops? Is there evidence of slow vertical or horizontal migrations of electric activity? What do they appear to, what may they, do?
14. Have electric records been replayed into the cortex or specific cortic neurons? Is there reason to think that this is difficult or unlikely?
15. May the RAS be bypassed by direct cortic excitation? (eg in cerveau isolé preparation)
16. What is the state of attempts to achieve direct occipital input for sight?
17. Is the auditory area (eg area 41 or adjacent) isomorphic to the cochlea & directly stimulable?
18. The number of neurotransmitters, seemingly finite, is at least small & nearly known? Related?
19. Direct mode of norepinephrine input? Norepinephrine (or other transmitters) in infancy as a route to high IQ? Other active routes?
20. Explanation of beta rhythm?
21. Thinking produces alpha desynchronization & decentralization--what's the nature of the last?
22. Appearance of long-term amnesias? (Some recent memory compatible, organic, restoration progressive, basis, &c?)
23. May memories be more sharply localized (eg very old)? Has any attempt been made to determine the exact & complete paths following by input & output?
24. New role of nonposterior thalamic nuclei?
25. May the centrencephalon be evolutionarily retrogressive en masse? Is it corticly'eliminable'?
26. May the temporal lobe & cerebellum suggest pallial future?
27. Why 15-layer (subcortic) bird brain?
28. What's below the outer few mm of cerebrocortex?
29. May the cerebellum have occipital-like columns?
30. May it function in idiot-savant counting?
31. What adult (nonsenescent) changes occur in the neurons (eg dendritic, spinal, chemic, dimensional, synaptic number, &c, &c)?
32. My hallucinogen-synapse hysteretic theory.
33. Explicate your RNA-DNA heretical hypotheses?
34. Does the man born blind, sight restored, come to see normally?
35. May that which checks neuron proliferation (what?) be simple & counteractable?
36. What about the experiment published in 1969 reporting that homografting doubling the mouthbreeder's optic tectum raised its intelligence to a rat's?
37. May micelles form a natural coorganellic continuum, eg via enzyme complexes?
38. What frontal reflexes or 'instincts'?
39. How exciting has been isotopic localization?
40. What's nature of blood-brain barrier?
41. How far has gone chimp-as-baby gestural raising?
42. Prodigies & idiots-savants--true most astonishing abilities & brain peculiarities at autopsy?
43. Explanation synaesthesia?
44. How complex are amygdalar nuclei & their behaviors?
45. Need the cortex have subcortic & limbic structures to experience or show 'emotion' or development?
46. What function served by # of allo- & isocortic layers?
47. How important (how?) may electrotonic fields be in the brain?
48. How are schizophrenia theories faring?
49. How complex & regular are effects elictable from the temporal lobe & cortrad neighbors (eg deja & jaima vu, oneiric, size-varying, Penfield, hallucinatory &c)?
50. Have other temporal lobe size-varying-like areas been found?
51. Describe the effects of DOET?

52. Is there necessary retardation in early hemispherectomy or commissurotomy? Has the latter been done on apes paranatally to see possibility of growing concorporate pair? This might be done on eg rats.
53. Is there evidence that man, as opposed to the other primates & preprimates, as fills his brain more, approaches its limits more? What possibilities seem favorable for man's superiority to previous animals (eg spinal, cortic areas, neuron types, sizes & distributions, gyral, fascicular, cytoarchitectural, in nerve transmitter ratios, in epileptogenicity, in neuron chronology & biography, in electroactivity (eg rhythm discipline & responsivity, &c))? eg granular # + appearance
54. How good is current tractography?
55. How poor is granular myelography?
56. What evidence is there that the brain esp shows, uses, or needs cleverer features of the full McCulloch logical representation & sophistications thereof?
57. How complex is/may be chemography (eg site complex, functional, informational)? How hereditary or invariable?
58. Significance of electronegativity/positivity?
59. How near or improbable is sleep curtailment? Are there microsomnal & asomnal mammals or animals?
60. Have we disproof that the cortex can eufunction asomnally?
61. How evolved is invertebrate neurography?
62. What is the course of neuronal evolution?
63. A 2°1°.5mm piece of cortex being developable, what's the nature of the activity (spontaneous, intraneuronal, patterned, a response to pattern, natural, 'intelligent', &c)?
64. Current thinking on bit-size of hereditary, adult, & capacitive human memory? Have huge figures been disfavored or relatively tiny figures gained any credibility (eg along serial lines)? What estimates might be made of animals, wherein cognitive & mnemic capacities might be distinguished & identified?
65. Why's memory (in the Penfield case) prochronomorphic, ie inclined to run forward & be temporally structured?
66. What evidence for multiphase (eg triareal or subareal) linquistic processing, & multicentric creativity?
67. Being often said that we need new & idiosyncratic mathematics to account for the brain, what're current premonitions & preconditions of these mathematics?
68. What were the bases for the scansion hypotheses of a decade ago & what're their current statuses?
69. Why does insect behavior seem to you so complex &/or impressive?
70. Is there evidence for a simply peptidic or polypeptidic memory?
71. What occurs when some or all association areas are disengaged?
72. What electric activity, architecture, &c is peculiar to these areas?
73. In old-age, is there a gradual retrogression of reminiscences; & a gradual weakening of posterior memory?
74. In terms of graphic areation, has there been further Brodmann or other evidence, & general differentiation?
75. How homogeneous have the projective afferents & efferents been found to be; conversely, how much mixture has been found?
76. Is the planar memory currently being considered to include the cell, nuclear, organellic, vesicular, & micellar membranes, hedra & reticula; is it particular? (Organellic includes ribosomal, mitochondrial, neurofibrillar, &c).
77. Could you elucidate the synaptomembranous polysaccharide mapping you mentioned?
78. Any new indications of neurofibrillar conductive or general function?
79. What recent evidence for what routes of interneuronal chemic distotransmission?
80. What evidence for a chemical evolution (by gradual multiplication or differentiation) for psychogenetics? Anything phylogenetic?
81. Anything ontogenetic?

82. Latest or scoptophobia or other (& how high) macromolecular transfer? What's the receptive theory, in even the vaguest way, behind this?
83. Any attempt to interchange auditory & optic (or other) nn in animals, eg to see & measure if the respective areas are senso-specially preorganized?
84. Conversely, any attempt to invert or even reorganize intranervic fibers predevelopmentally? Has a relatively simple organ, such as a colliculus, been predevelopmentally reversed, eg multitemicly?
85. Have stimulative neurotransmitters been monorganicly applied to illuminate partial roles in animals?
86. Have attempts been made to transfuse chemicals homotopicly interorganismicly?
87. What happens when the neuron/glia ratio is nonpathologicly improved?
88. Is antidromic axo- & dendritotransmission impossible or unimportant? Might this play a motoral role?
89. What does caffeine do, just release?
90. Panoramic memory is how explicable? How describable?
91. Could a bath substitute for a structure ad instar the glia?
92. In terms of cause & effect, might hippocampal & parahippocampal hyperexcitability account for dendritic hypertrophy & a residence of memory theory?
93. Where can complex hallucinations arise? Where do kinal & cinematic hallucination begin to appear?
94. What was the detailous character of Penfield's (& successors') reproductions (arbitrary, analytic, chronal, behavioral)? Is there any reason for thinking them atypical?
~~95.~~ The 7 levels of cellular responsivity sofar established, are these Hubel columns or perpendicular?
96. What's the computer doing today to analyze complex cephalic electroactivity?
97. What's the nature of lo^8-fibrous callosal information? Why apparent hemispheric redundancy?
98. What about arithmetic cells, may these count coigns, synecdochic parts for esemplastic memories, what do they count, what's their organization, &c?
99. Ephaptic function?
100. Column computer simulation?
~~101.~~ To what degree are af-efferents layer VI & VI6 in ratio to more random?

"Introduction" - noli me tangere

Before beginning, it is possible to set out some idea of why this book is being written and what it is I intend to do.

This book is being written to resolve the mystery of what man is and how he works. Everywhere in the book the author's optimism about our future and about the powers of the mind will be in evidence. It is as well to test and explore these two optimisms that we are here. I want to show and prove that science, which always and more recently has forgotten this, rests as much on intuition, intense love, the individual, global thought, ambition, impetuosity, personal style, certain methods, a view of the future, and all spheres of the world as on any of its current obsessions; in this way, the book is a spit in the face of the current scientific and parascientific world—remember your lesson! I want in this book, and from its various outcomes, to restore to men hope, joy, love, purpose, sense, being, adventure, direction, and even knowledge, to turn the tides now racing over these things. There are diverse personal purposes in writing this book. I am not what social norms would say I am; I believe I am far more, and in this book I will test and measure that hypothesis—a test of manhood, but far more, something like a test of deity. If I prove right, you take note that you are, or are potentially, far more, and acquire the proper self-respect and respect for others; I want to redirect your mind to a new eminence and your soul to a new nobility; and there is no one exempt from this challenge.

Many of said that the world has changed and changes about us. The world has not changed at all compared to what will happen over the next 5 decades and 5 centuries. Arising out of this book will be an important image of the course of that change, and something of an inception of that change, in terms of one cause and its external consequences. There will be founded in this book a science of being to be known as ontology. Across this book, explicitly and implicitly sketches will appear on things which may and which will happen as productions of this science.

It perhaps seems a bit pretentious to say that, in addition, this book is meant to work a transformation in something as seemingly changless as the style of human thought in its essential nature, but that I also foresee as an outcome of this book. And let me say once and no more (explicitly) that, buster, I could care less what you think of this book, its style, its content, its author. If you haven't the brains, care, insight, manner, width, knowledge, or whatnot to read it, then go elsewhere; basically, you bore me. Let God listen, critically but tolerantly, because I follow assiduously my conscience.

THESE PAPERS

I am trying to summarize neuroscience and explain the brain, at least as far as this batch of papers is concerned. These papers represent, often unfinished, sections of what is sketched as a book of a thousand pages. They represent neither the range nor depth of subjects that it will. Nonetheless, they are the beginnings of this effort, and I have reason to believe will have some interest to others. Because of the overambition of this book and the methods of its execution, feedback and recommendations from others could be uncommonly useful and I am hoping to elicit some of it from this present circulation. The author tosses aside any claims to omniscience and requests advice on specific matters. Just as an example, I would appreciate having any questions that come to mind as being such that I might solve, comment on, or imprint, questions or problems dealing with any area of the neurosciences.

These papers have not been put in any pretentious order and are basically a laugh at chronology. But this is not a laugh at god, and some order should have been met introductorily. Taking what order exists, then, the following commentary table of contents is given expiatorily.

We begin with a chirpy little NOTE TO THE DEVOTED READERSHIP. It tweets for itself. We proceed to a profound AN INITIALLY VAGUE DESCRIPTION OF HOW A SCENE IS RECOGNIZED. By that I meant that it was somewhat in advance of subsequent ideas and conclusions of my book. A scene is presented, a courtyard-mall of one of those new indoor shopping centers that are so exhilirating, and is analyzed through neural theories. A variety of scenes analyzed in this way might complete experience. No exhaustive treatment of the scene is given. The reader may wish to compare it with his own ideas. GRAMMATIC AND SEMANTIC PROBLEMS AND THEIR SPECIAL SOLUTION begins my work on the topics and suggests some approaches. It is worth mentioning that my ideas at this moment seem quite able to cope with these and other matters, but of course there is no assurance that my systems or beliefs accord with reality. THE ANALYSIS OF IQ TESTS AND THE NATURE OF INTELLIGENCE initiates a long consideration of these two themes. It presents a few problems and suggests that the simplicity of their solution may mean that the world and the operations of intelligence are not so complex after all. The reference was H. J. Eysenck's book, "Know Your Own IQ", and I am by no means satisfied with it. DESCANT and SONIC ORDER illustrate a touch at applications of my theory of order to sound and music, for example as a prelude to voice. In the former I conclude with a rather interesting idea on a criterion of true art and in the latter analogies are made between sonic and temporal perception and human thought. A cultural basis of man having language and the dolphin not is suggested. In my peevish WHY SHOULDN'T THE THEORY HAVE EXPLAINED AUDIOGNOSIA? I take a whack at the doctrine that it ("theory" in sense of body of theory) hasn't by a cartoon-strip-like case that it has. Those seeking introduction and those still seeking confirmation are directed to its small face. On the next page there appears without explanation a reproduction of a note reacting to a pictorial collection of eyemotions of newborns. It's an extremely dense paper, in terms of number of novel notions developed, & presents my idea that "germinal oculokinetic clusters" may form as a topsoil for the growth of visual perception and may even propagate over the cortex as isorhythms, perhaps like seed nuclei in rainmaking. Notes appear throughout the book and are denoted by leftmost asterisks. The next note likewise has no introduction in the text, but documents part of my intolerant onslaught to lax explanations of Hubel and Wiesel's cells. THE DIRECTION OF NERVOUS EVOLUTION contains my introduction to and very beginning of a list of perhaps 1,000 references to evolution or change approaching man. Eventually the list will take on more and purely speculative possibilities. COMMENTS ON LITERARY ASPECTS OF VISUAL PERCEPTION is very small at this point. SOME FURTHER PRINCIPLES OF THESE SCHEMES came at a time when I was first tackling vision as a special problem of perception. It contains one bold concept but many faces thereof.

"Ignorance is more than bliss" (or is the tree of knowledge)

NOTE TO THE DEVOTED READERSHIP

Pat Gunkel

This is an electric and I don't know how to work a Woody Woodpecker so here I exhibit all the frailties of the technological relationship. The collection of papers you have here comprises two types and is inexcusable anyway. I allude to my mannered discourse and the fact that I write first esoteric and then exoteric notes for the eagerly ashoulder. There is yet another texture here inasmuch as some of the papers are relatively finished and compact versus papers wherein the material is prosaic, exemplary, shop matter, and either astronomically or subatomically abstruse. At the moment I have set sail upon the great sea of motor processes and the watchful will find papers strewn in a young wake.

Also of importance is the presence of something that might pass as as a general theory of the brain, often manifest only by a few microcrystals arranged without order at random intervals. It is characteristic of my style, what passes for one, that in any one paper and at any one time many ideas are pursued, presented, and held somewhere in mind at once, even if they only appear elsewhere. Therefore the reader has been fooled, for he holds before him essentially a hodgepodge of indigesta.

Bon voyage!

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Boston, Mass.
02115
U.S.A.

FUTURE TOPICS

1. What are the limitations of human mentality?
2. Analogue operations in the nervous system.
3. Thymognosia.
4. Chronognosia.
5. Paragrammatical syntax. The syntactic-semantic interzone.
6. Relations between semantics and highest thought. (Semantic and logic?)
7. Diconvergence.
8. The signifigance of temporal lobe cells for cells throughout the cortex.
9. Cortic mental microfunctions.
10. Foresight, purpose, autocatalysis, ethos, dianoia, ataxary.
11. Truth, beauty, good, perfection, love, happiness.
12. Pleasure.
13. Intuition, 'telegnosia', holism.
14. Praxia, poiesis, imagination.
15. Memory.
16. Multifunctionalism and multistructuralism.
17. Others' models of the brain.
18. Serialism.
19. Brainstem neurography and operation.
20. The interrelations of the brain.
21. The economy of the brain.
22. Comparative noology of neocortex, archicortex, paleocortex, basal ganglia, diencephalon, stem, spine, periphery, various invertebrates.
23. Existential cytoarchitectonics.
24. Extrapolated cytoarchitectonics.
25. Functions performed by substages on sensory and motor paths.
26. Tasks for the future of neurology.
27. Neurotechnology. Part 1: scientific.
28. Neurotechnology. Part 2: mundane.
29. Raisons d'etre of neurology.
30. Birth of ontology.
31. Computer and the brain.
32. Wild neurologic and noologic ideas.
33. Syzygy of agnosiography and epistemography. (Science and inscience?)
34. Structure of neurology.
35. Growth of neurology.
36. Neuromethodology.
37. Critique of neurology as it is now. (Maldistribution, malorganization, &c.)
38. Ultrastructure.
39. Neurochemistry.
40. Neuropathology.
41. Neuropsychology.
42. Neurophysiology.
43. Neuropharmacology.
44. Neuroanatomy.
45. Neurocytology.
46. Neuroevolution and neurozoology.
47. The idea of flow over the cortex, through the brain, &c.

A DICTIONARY OF PERSONAL CONCEPTS

Pat Gunkel

In the course of my work I have invented concepts and words meant to be both temporary and lasting. They are important in the explanation, test, and advance of my work and deserve definition.

RANDOM CONTINUA (also "random nebulas")
CONDIVERGENCE
DICONVERGENCE
PARTITIONING
REPRESENTATIVE CONFIGURATION
SCATTER
DECUSSATION
AUTOCORRELATION
INTEGROCORRELATION
TRANSCORRELATION
UBIQUITIZATION
FUNNELING
NONDISCLOSURE
NIHILI
RANKING
AUTOCOMBINATION
DEBOUCHMENT
IMMOLATION
NOOGENESIS
STOICHIOGENY
GEOCAMPTIC STOICHIOGENY
ANALOGIC
TRANSINFORMATION
EIDOMUTATION
IDEOMORPHOSIS
POSTCORTICES
PRECORTICES
INTEGROMORPHOTIC
META-
ROOM OF THE MIND
RAT ALLOCATIVE BOXES IDEA
INTRACLASSIFICATION:
- DISCAL
- ANNULAR
- CENTROSYMMETRIC
- EPISYMMETRIC

INTERCLASSIFICATION
TELECLASSIFICATION
INTERPRETIVE UNIVERSES
EMBEDMENT
CENSUSES
CIRCULATION
BRIDGEWORK & BRIDGING
NUCLEAR ALGEBRA
CONCINNITY
CELL FIDELITIES
ALLOCATION
WIRING

WOLI
HEIGHT
CHRONESTHESIA
EGOGENY
QUIDDITATION
INDIVIDUATION
HYPOSTATIZATION
ORTHOGONAL REGULARIZATION
COLLIMATION
NEURONOGRAM
HISTORY
MANY HISTORIES
BRIDGE-BURNING
EVACUATION
NEUROBRACHIA
CURVES
CONTINUUM RESERVOIRS
SLOW-SWITCHING
QUICK-SWITCHING
LASTING-SWITCHING
DECISIONAL TREES
FURCAL CONTINUA
SWITCHEL
WALKING
MATRIC TRANSFORMATION
ERROR-ERASING
SHARING
WEDGING
AMPLIFYING
UNBOTTOMED
SMOOTH
EVEN
SORTING
INTENSIVE
CRINKLING
PUNCTUATION
HOLISTIC
RECOORDINATION
CONSOLIDATION
SCANNING
LIBERATION
ANTICIPATORY INHIBITION
ANTICIPATORY HABITUATION
PROACTIVE GENERALIZATION
COINCIDENTAL TEXTURES
SUBDIFFERENTIATION
SATURATIONS
EXPLORATIONS
PALIMPSESTIC MEMORY
RECENT-CENTERED
OLD-CENTERED
SCREENS
MASS TRACES
REVERSE-HABITUATIONAL MECHANISM
OCULOKINESES

AUTOEXCITATION
CHRONOCORRELATION
DIACHRONIC
PROLONGATION
EGALITARIANISM
LABILITY
AUTONOMY
CANDELABRA
CHIPS
PANDYA'S CIRCUITRY
PILE
HARMONIZATION
REVERBERATION
QUANTIFICATION
CANCELLATION
OMNISCIENCE & SELF-IDENTIFICATION
HABITUATIVE DELETION
POLE
SANCTUARY
TOTTERING
RETICULA
VERIFICATION
SIGNS
DISOBSCURATION
COMPLICATION
UNIVERSALITY
THIN BRANCHLESS STEMS
MOLECULAR PREDICTORS
CIRCUMVENTION
RETROSPECTIONS
SALTATIONS
DARWINIAN PRINCIPLES
ORTHOPHENOMENOLOGY
FIGURE & EQUATION
HYPERBOLIC ANALYSIS
INFINITE SETS
POSITIVE & NEGATIVE STATISTICAL TEXTURE
EXTRAPOLATIONS
TOPARCHY
AVALANCHES
AMBIGUOUS STORY
STORY
DEGREES OF FREEDOM
ASEPTATE REASON
HYPSICENTRIC
UNIDIMENSIONAL
SUBTHEMES
DEVIATIONS
AUTOCONNEXION
CLATHRATION
ISOPORE
SPECIFIC UNIVERSALITY
RANDOM HIERARCHICALIZATION
HOLAREAL
MACREAL
(SELF-)FAMILIARIZATION

LOOPED
IRRADIATION
TRACKING
REFRACTIVE HIERARCHICALIZING CLOUDS
CODEFINITION
DISPOSAL TRANSFORMATIONS OF EXPERIENCE
STEREOTYPIC ROOM
ORIENTING EYE
UNIVERSAL IMAGE
CRYSTALLINITY
CELLULAR ASSIMILATION
ANTISATURATIONS
SATURATIONAL TRIGGERS
CIRCULAR RECORDING TAPE
DISFAVORANCE
LATEROINHIBITORY
INVERSION OF SIGN
ENTRAINMENT
HABITUATIONAL MINIMA
SELF-REINFORCEMENT
COMPACT ELABORATION
GERMINAL OCULOKINETIC CLUSTERS
FLORA
ISAREAL
RETROCORTICS
SAMPLING CONTINUUM
LARGER FIGURES
ANALYTIC SYNTHESES
SUPPLANTATION
MULTIPLICATION OF ENGRAMS
MIGRATION OF ENGRAMS
TEMPORAL CONSIGNIFICATION
SELF-REVERBATORY ELONGATION
COMMON DENOMINATORS
ASYMMETRIES OF FLOW
CELLULAR REGISTRATIONS
MICRONIDULI vs MACRONIDULI
ADDITION vs SUBTRACTION OF POSITIVE vs NEGATIVE ELEMENTS
POSITIVE vs NEGATIVE RELIEF
SPECIFICATORY DIFFERENTIATION
KEYED ASSIMILATION
COMAPPING
PARAFOLIAR
'GESTALT' LEARNING
INFLUX vs EFFLUX
CIRCUIT ALTERNATION vs COMPUTATION vs SWITCHING vs MODULATION
CENTRONUCLEAR
SUFFICIENCY
FURCATION
DENDROARBOR
PROCESSUALIZATION
ROTATION
MOTOGNOSIA
DIFFERANCES

MEMORY HYPOTHESES:

ACTIVE vs PASSIVE
COINCIDENCE-DETECTION vs SCULPTURAL
SOLITARY vs INTERACTIVE vs IRRECIPROCAL
POINTILLISTIC vs ANALOGIC
OLD-CENTERED vs NEW-CENTERED CUMULATIVE vs REDACTIVE vs PURELY DYNAMIC

MANY UN/LIKE OBJECTS AT ONCE
MULTIPLE CONCURRENT PERCEPTUAL MODES
OMNITUDE OF ANY MOMENT OF CONSCIOUSNESS
CAPACITY OF PARTS OF THE MIND AT ANY ONE MOMENT

POSSIBLE NEURAL SUBSTRATES OF BEHAVIOR:

LIFE STORY
LIFE STORIES
STORY-LEARNING MIX
AMBIGUOUS STORIES
STORIES WITH BEGINNINGS, MIDDLES, &/OR ENDINGS
LOTS OF TRIGGERS AND EFFECTS
CONSTRICTED TRIGGERS AND EFFECTS
ONE 'PECKING ORDER' IN THE STRUCTURES, &C
MANY PECKING ORDERS IN THE STRUCTURES, &C
VARIOUS CONSTELLATIONS IN THE STRUCTURES, &C
ONE VARIOUSLY-MODULABLE CONSTELLATION IN THE STRUCTURES, &C
IR/REVERSIBLY EMPIRIOGENIC CONSTELLATIONS &/OR PECKING ORDERS
[PROTOTYPAL, ALPHABETIC, &/OR 'ABSTRACT'] [THEMES, CRITERIA, STYLES, REQUIREMENTS, LIMENS, LIMITS, &C] IN VARIOUS [WAYS, DEGREES, REPRESENTATIONS, HIERARCHIES, &C] FOR [GENERAL OR SPECIFIC] THINGS
[INTERFERENCES, BACKGROUNDS, TEXTURE, TECHNICAL CHARACTERISTICS, &C] FOR THE VARIOUS [THINGS AND STRUCTURES]
VARIOUS ['DIMENSIONS' OF SEQUENCES OR 'KALEIDOSCOPIC LEDGES']
VARIOUS [CLOCKS, COUNTERS, COMPUTERS, RATES, DIRECTIONS, CYCLES, MOMENTA, SCARCITIES, ONTOGENIES, IDIOSYNCRASIES, RHYTHMS, MULTIVALENCES, &C] IN STRUCTURES
MUTUAL CONSTRUCTIONS IN [STRUCTURES AND THINGS]
[DEGREES AND KINDS] OF INNATE [KNOWLEDGES AND IGNORANCES] OF THE ENVIRONMENT
VARIOUS COGNITIVE COMPLEXITIES
'HILL(S)', 'CAPACITIES', 'FRAGILITIES', 'DEATHS', 'ILLNESSES', AND 'PERVERSIONS'
VARIOUS MUTUAL CONTROLS (i.e., cf., [illegible])
VARIOUS INDIFFERENT CHOICES
VARIOUS [PURE OR IMPURE] [NONCONSERVATIVE OR CONSERVATIVE] ECONOMIES
VARIOUS VARIOUSLY INNATE [TEXTURES, AVERAGES, &C]
[EXHAUSTIONS, HARMONIES, AND INTERACTIONS] OF IDEAS FOR [EXTRINSIC AND INTRINSIC] CAUSES
WHATEVER ELSE

SPACIOCORRELATION
ISOFUGAL
PERIODICITIES
CHIASMATA
RESPREADING vs COMPLETIVE SPREADING
CONFIGURATIONS OF CONFIGURATIONS
COLLOCATION
N-DIMENSIONAL MOSAIC
SELF-TREATMENTS OF INFORMATION
AUTOCOMMUNICATION
FLUXIONS
REFLUXES
EMISSIONS
MENTAL [EVENTS AND PULSES] [SHORTLIVED, DAMPED, AND DIRECT vs PROCESSED, CATALYTIC, REVERBATORY, AND INTERACTIVE]
INTRACOLUMNAR

INTRACOLUMNAR PREANALYSIS
RELOCATION
COLLINEARITY vs VERGENCE
PEDAL, MACROPEDAL, &C
LIGHT vs HEAVY vs NON CORTICICORTICLE CONVERGENCE
FORE vs AFTER AREA, CORTICLE, &C
MICROSCALE MECHANICS
DAY OF WORK
BOUNCE DOWN A DECISIONAL TREE
CRASH
UNFATHOMABLY COMPLEX, DIFFUSE, AND INTERRELATED INTRACATEGORIC, INTERCATEGORIC, PARTIAL, AND OCCASIONAL RESPONSES OF JERZY KONORSKI-CHARLES GROSS CELLS
LOWER LEVELS UNDER TRANSCENDENTAL LEVELS
TISSUAL SYNCHRONIC MODES
CORRIDOR & COORDINATE SYSTEM
N-ORDER RINGS
TEXTURE OF THE WORLD
NIDULATION
STREAMLINING
PRIMARY ORDER ORDER IN EXPERIENCE:
- RECURRENCE
- IDENTITY
- HOMOMERY
- HOMOTELEUTY
- DENSITY
- HOMOLOGY
- ENERGY
- SPECTRALITY
- CONCRESCENCE
- CONTEXTURE
- CONFIGURATION
- COLLINEARITY
- CONTINUITY & TOPOLOGY
- COMBINATION
- CONCRETION
- CONDUCTION
- COMMENSURATION
- CONCINNITY
- CONCREATION
- GONOHOMY
- CONCERN
- COVARIANCE
- ANTAGONISM
- HOMOCENTRY
- CONFLUENCE
- INTERCURRENCE
- ALGEBRA
- CHANGE-REGULARITY
- COMPLEMENTARITY
- OSCILLATION
- DEGREES OF FREEDOM
- PRECISE PERIODICITY
- RHYTHM
- ISOCHRONY
- ISOPLASTY
- VARIATION & CREATION
- ISODYNAMY
- ISOPORY

(CONT. OF ITEM "Primary Order Order In Experience":)

ISOPHORY
ROUGHNESS & RANDOMNESS
MULTIPARTY
BUNCHING
GROUPING
ISOCYCLY
ISOTROPY
ISOCONTENTY
VACUITY
ISOCAUSY
LOGIC
NOMY & ISONOMY
ISOPHENY
MONOTONY
STATICITY, CONSERVATION, STOICHIOMETRY & ELEGANCE, OLIGOVALENCE
ISANOMALY
ISOPYCNICITY
ISOTOPY
COMOTILITY
ISOTACTY
PRECISION
"MEANINGS"
SPECIES OF OBJECTS
COSURFACES
SHAPES
HOLOTACTY
ISOSEQUENCY
PROGRESSION
COORDINATION & ORGANICITY
INTEGRITY
SLOWNESS
FASTNESS
ANISOTEMPORALITY
GENERAL VARIETY (HUGE BANDWIDTH IN 'HUE, SATURATION, AND BRILLIANCE' WITH GREAT ORGANICITY OF THESE THINGS, 'FREQUENCY MODULATION', ULTIMATE COMPLICATION OF 'TIMBRE', 'EVEN' AND MEANINGFUL CLUSTERING, GOOD OMNIVERSAL DISTRIBUTION, SELF-MODULATIONS BY SOCIETY AND THE INDIVIDUAL, MANY PRIMARY QUALITIES, KALEIDOSCOPY AND SELF-VARIATION (AUTOMORPHISM) & INTERACTION & EXHAUSTION & MULTIREPRESENTATION & IRIDESCENCE OF OBJECTS, &C; SOUNDS, LIGHTS, OTHER SENSES, IDIOMORPHIC EVENTS, WORLD MAP, TIMES, THE TYPES OF NUMBERS, THEIR NUMBERS, THEIR DISTRIBUTION, AND THEIR INTERCORRELATION; VARIETY, INTERORDERING, AND INTERCORRELATION OF LAWS; HETEROMERY, INFINITE AND INCOMPATIBLE VARIATION; OPPOSITES AND COMPLICATIONS OF ANY OF THESE THINGS)
INTERMODULATION OF THESE 72 TRAITS

IRENIC
RHADYNAMIC
RHACAUSAL
EPITROPIC
MOGIPHOBIC
MIANALYTIC
SIMPLOHIERARCHIC
SIMPLORHEIC
CELLOCLASSIFICATORY
TIGHT
SIMPLE
STATOTHETIC
HOMOMETRIC
AUTOMORPHIC
MYRIOPULSILE
PHYLOCYTOGENY

POSSIBLE MODES BY WHICH CORTICES ARE INFORMED:

- SERIALLY vs LATERALLY
- TRANSPOSITIONALLY vs ISOPOSITIONALLY
- SINGLY vs MULTIPLY

SPECTROTOPY
TOPOTYCHIC
SECOND ORDER ORDER IN EXPERIENCE
Nth ORDER ORDER IN EXPERIENCE
METASIZE
METAINTENSITY
METALOCATION
METAORIENTATION
METACLARITY
METASTABILITY
METAVARIETY
METAPOPULATION
METACOLOR
METASETTING
METAMOTION
METATIME
NEUROGRAPHY
TYCHISTIC THEORY OF MIND

+ identify these nets
to ergodic values

THE TEST OF AN EXPLANATION

Pat Gunkel

When I set out to explain the brain I did not foresee what I was getting into because the requirements for an explanation have never been defined. So now that it appears to me I may have succeeded in explaining the brain I encounter an even greater problem of explaining what I mean. Not only that, "proof" is also wanted and undefined. Which in turns presupposes "conviction" of any relevant parties, in short, a mass effect. So my task, and ultimate accomplishment potentially, is quadrupled. I suppose it might be wise to circulate a questionaire in connexion with these issues and to stipulate, at its close, that, the criteria having been met, the brain will have been adquately "explained". But I fear that even this discussion will be incendiary and make an explanation more dubious so I and my burden are actually backsliding. Oh, how hopeless! Let me spare the questionaire, then, and devise my own criteria with an invitation to the rambunctious reader to exercise his wits on them, demanding proof of prooflessness and defense of criticism, with the stipulation that in the end the reader will have regressed for want of definition of these concepts.

It is necessary, or at least desirable, that:

i. The style be impeccably and unsuspectably academic: florid, familiar, stiff, circular, illogical, offensive, limiting, self-disguising, pretentious and yet self-denying, heavy, incomprehensible, aimless, trivial in data and message, old, sensational, authoritative, indirect, work-extending, complimentary, designing, orthographic, illustrative, confused, successional, soporific, amnesic, funded, conservative, haphazardly formal, underwritten by a fad, pessimistic, insulting, and full of shibboleths. Why? Only God knows.

ii. I must have performed some experiments, regardless of their novelty or relevance, and these must take up most of the presentation with negligibles. These must have confirmed the theory but not have proved anything (which would be suspect as too ambitious), although I must do my best to disguise them as seemingly proving it (the paradox never having been "explained").

iii. I must "answer" all the problems (many themselves doubtful) and data.

iv. I must make a set of predictions, to add to future controversy, to draw on the obvious, and to exercise the falsehoods of science. I must look under the microscope and see something written there, "Bingo!" Which observation must be repeated many times by many laboratories under various conditions, so that it can become the new dogma.

v. Fifty years must have passed and the explanation have thus become a defense of now-controversial tradition.

vi. I must have wooed a fanatical following and have exchanged it for everyone now working in academe, industry, and government and thereby suborned institutional acceptance.

vii. I must have since gotten a spot for myself on TV.

viii. Of course, I must have eliminated all contradictions in my work, and carefully bury or reface the road over which I have come, not only to prove my theory but to enhance my genius and future livelihood as a common simplifier.

ix. I must come upon my discovery by way of a team, some collaborators, and a clue.

x. I must have shot and nailed down all potential and real competitors by any means availible, including bribery, sarcasm, or machinations to cut off their funds.

xi. Everybody must believe, too.

This may seem an awful lot, but other people have succeeded in the past, so I must read books on mass behavior.

GRAMMATICAL DICTIONARY

Pat Gunkel

grammar. (gramma letter, piece of writing) A branch of linguistic study that deals with the classes of words, their inflections or other means of indicating relation to each other, and their functions and relations in the sentence as employed according to established usage and that is sometimes extended to include related matter such as phonology, prosody, language history, orthography, orthoepy, etymology, or semantics.

accidence. (accidentia inflections of words, nonessential qualities or circumstances) The part of grammar that deals with inflections.

morphology. A study and description of word-formation in a language including inflection, derivation, and compounding - distinquished from syntax. The system of word-forming elements and processes in a language.

syntax. (syntassein to put in order, arrange) Sentence structure: the arrangement of word forms to show their mutual relations in the sentence. The part of grammar that treats of the expression of predicative, qualifying, and other word relations according to established usage in the language under study.

syntactic construction. A grammatical construction having only free forms as immediate constituents (as "he went to school") - compare morphological construction.

syntagm(a). A syntactic unit: a word or phrase that has or can have syntactic relation. Gives syntagmatic.

synthesis. The combination of radical and modifying elements into single words (as Latin patri to the father): frequent and systematic use of inflected grammatical forms - contrasted with analysis; compare polysynthesism. Gives synthetic.

analysis. The use of function words (as prepositions, pronouns, and auxiliary verbs) instead of inflectional forms as a highly frequent and characteristic device in the structure of a language (as English I have seen contrasted with Latin vidi or English of the room tending to replace the room's or does he know that? replacing knows he that?) - contrasted with synthesis. Gives analytic.

polysynthesism. A grammatical practise of some languages (as American Indian) of combining word elements into a single word that is equivalent to a sentence in other languages. Gives polysynthetic.

morphological construction. A sequence of morphemes forming a complex or compound word as unlike, baseball) - compare syntactic construction.

radical. An uncompounded word or element without prefix, infix, suffix, or inflectional ending: root.

noun. (noun name) A word that is the name of a subject of discourse (as a person, animal, plant, place, thing, substance, quality, idea, action, or state) and that in languages with grammatical number, case, and gender is inflected for number and case but has inherent gender. A word except a pronoun used in a sentence as subject or object of a verb, as object of a preposition, or being a name in some absolute constructions or as the predicated element after a copula. Gives nounal, nounally.

noun equivalent. A word group or a word not otherwise a noun in a syntactic function ordinarily performed by a noun.

KINDS OF NOUNS:

abstract noun. Name of a quality, action, or condition.

collective noun: noun multitude. Noun which denotes plurality without a plural termination.

common noun: common name. A noun that is used with limiting modifiers (as a or an, some, every, my) and that designates a being or thing of which more than one specimen exists (in each of the phrases no horse, such a crowd, some water, his courage, a Mozart, the last word is a common noun).

compound noun. Noun composed of two or more other words in composition.
concrete noun. Name of a substance or material object; or of a quality, action, or condition inherent in that subject.
derivative noun. Noun derived from another word by means of some affix.
diminutive noun. Noun which expresses diminutive size.
material noun. Name of a material.
participial noun. A participle used as a noun.
primary noun. Noun not formed by derivation.
proper noun. An individual name.
simple noun. Noun not formed by composition.

NOUN--ASSOCIATED WORDS:

case. The relation of a noun to other words.
ablative. Case denoting the relation usually indicated in English by with, from, by, in &c.
accusative. Case equivalent to the English objective.
dative. Case of the indirect object.
genitive. Case denoting the relation indicated in English by the possessive, or the preposition of.
nominative. The case in English of the subject of a finite verb, the predicate noun after a nominative, the person or thing addressed, the subject of a participle, and the independent noun.
objective. The case of the object of a verb, the predicate noun after an object, the subject of an infinitive and after a preposition.
possessive. The case indicating the possessor.
vocative. Case in several lanquages of address.
gender. A grammatical distinction expressing the natural distinction of sex.
feminine gender. Gender of the names of females.
masculine gender. Gender of the names of males.
neuter gender. Gender of the names of things without sex.
number.
dual number. Number expressing two.
plural number. Number denoting more than one.
singular number. Number denoting but one.
person. Grammatical distinction to express the relation of a noun to a speaker.
first person. The speaker.
second person. The person spoken to.
third person. The person or thing spoken of.

participle. A word having the characteristics of both verb and adjective; esp: the English verbal adjective ending in -ing or in -ed, -d, -t, -en, or -n that has the function of an adjective and at the same time shows such verbal features as tense and voice, capacity to take adverbial qualifiers, and capacity to take an object----see past participle, present participle.

object. A noun or noun equivalent denoting in verb constructions that on or toward which the action of a verb is directed either actually or as conceived (as ball in I struck the ball and what had happened in I saw what had happened) and either immediately (as thanks in I give thanks) or less immediately (as you in I give you thanks); a noun or noun equivalent having with an adjective or adverb a relation analogous to that of object with verb (as trouble in worth the trouble and brother in like his brother); a noun or noun equivalent in a prepositional phrase (as table in on the table and city in from the city).

phrase. A group of two or more words that form a sense unit expressing a thought either fragmentarily without a complete predication (as in Good for you!) or with a weakened form of predication (as in God willing) or as a sentence element not containing a predication but having the force of a single part of speech (as in could have been found) and that bear to one another either the modifying relation (as in faithful dog) or the coordinate or multiple relation (as in dogs and cats) or the composite relation (as in might have been found)--often used with a qualifying grammatical term indicating structure (participial, infinitive, prepositional, and verb phrase) or syntactical relation (adverbial, appositive, noun, verbal phrase).

clause. A group of words containing a finite verb but not constituting a whole sentence either because it functions as a noun (as in "I don't know how he got there"), adjective (as in "the account that he gave was true), or adverb (as in "he stopped when he saw the signal") in the larger sentence to which it is subordinate or because it contains or is modified by one or more clauses subordinate to it (as in "I don't know how he got there") or because it is joined to another clause of equal rank with itself (as the two clauses in "he stopped the car and they got out"); a group of words containing a nonfinite verb and functioning in its sentence somwhat like a subordinate clause (as in "he saw the man leave" and in "his tire fixed, the man drove off) - compare phrase.

inflect. To give inflection to (a word): vary (a word) by inflection: decline (eg inflect a noun): conjugate (eg inflect a verb); to change or vary the pitch of (as the voice or an utterance): modulate.

inflection. The variation or change of form that words undergo to mark distinctions of case, number, gender, tense, person, mood, voice, comparison; a form, suffix, or element involved in such variation; accidence.

article. Any of a usually small set of words or affixes used with substantives (as nouns) to limit, individualize, or give definiteness or indefiniteness to their application (as a, an, the)—traditionally considered an adjective.

articular. Being an article: accompanied by an article (eg the articular infinitive in Greek): characteristic of an article (eg the articular use of a former demonstrative adjective).

articulate. Segmented into syllables or especially into words meaningfully arranged: constituting intelligible speech; possessing the faculty or power of speech.

declension. Noun, adjective, or pronoun inflection; a presentation in some prescribed order of the inflectional forms of a noun, adjective, or pronoun; a class of nouns or adjectives having the same type of inflectional forms eg Latin nouns of the second declension have their nominative singular in -us or -um and their genitive singular in -i) (eg Latin adjectives of the third declension such as facilis). Gives decline.

locative. The locative case or a word in that case; belonging to or being a grammatical case that denotes place or the place where or wherein.

gerund. (gerere to bear, act, perform - more at cast) A verbal noun in Latin that occurs in the genitive singular, dative singular, accusative singular, and ablative singular and that expresses the action of the verb as generalized or in continuance (eg in Latin ars vivendi "the art of living" and fratrem laudando "in quoting your brother", vivendi and laudando are gerunds); any of several linguistic forms in languages other than Latin that are felt to be analogous to the Latin gerund; esp: the English verbal noun in -ing that has the function of a substantive (as subject or object of a verb, object of a preposition, or complement of a verb) and at the same time shows the verbal features of tense and voice (as choosing, having chosen, being chosen), capacity to take adverbial qualifiers, and capacity to govern objects when the verb is transitive and that may have a subject in the objective or common case but often takes in place of a subject a possessive qualifier denoting the agent of its action especially in literary use and when the agent is a pronoun or noun denoting a person or persons (eg in the sentences "I am surprised at his taking the matter so lightly" and "he left without anyone in the room noticing his departure", taking and noticing are gerunds). Gives gerundial.

gerundive. The Latin adjective that serves as the future passive participle, expresses necessity or fitness, and has the same suffix as the gerund; a verbal adjective in a language other than Latin analogous to the gerundive.

transitive. Of a verb form: expressing an action that carries over from an agent or subject to an object: taking a direct object; of a grammatical construction: containing a transitive verb form. Gives the noun.

transitivize. The make (a verb form) transitive (as by adding a suffix).

intransitive. Not passing over directly to an object (eg an intransitive action); expressing an object or state as limited to the agent or subject or as ending in itself: not taking a direct object—used of a verb form (eg the verbs in "the bird flies" and "he runs" are intransitive) - compare absolute; being a construction containing an intransitive verb form.

preposition. A linguistic form that combines with a noun, pronoun, or noun equivalent to form a phrase that typically has an adverbial, adjectival, or substantival relation to some other word (as of in "they are proud of him", with in "the man with a red face", or outside in "it came from outside the house"). Gives prepositional.

prepose. To place (as a particle) before a grammatically connected word (eg the articles are preposed in most languages). Gives prepositive.

voice. Distinction of form or a particular system of inflections of a verb to indicate the relation of the subject of the verb to the action which the verb expresses - see active, middle, passive.

active. Of a verb form or voice: asserting that the person or thing represented by the grammatical subject performs the action represented by the verb (hits in "he hits the ball" and shone in "the sun shone" are active) - contrasted with middle and passive; of a verb or verb form: expressing action as distinct from mere existence or state ("he walks" and "he walked" have active verbs)--now used especially in the grammar of certain American Indian and African languages; compare neuter, static, stative; of a grammatical construction: containg an active verb form.

middle. Of a verb form or voice: typically asserting that the person or thing represented by the grammatical subject both performs and is subjected to or affected by the action represented by the verb (Greek louomai "I wash myself" is in the middle voice)--used esp in the grammar of Greek and Sanskrit; compare active.

passive. Of a verb form or voice: asserting that the person or thing represented by the grammatical subject is subjected to or affected by the action represented by the verb (was hit in "he was hit by the ball" and was given in "he was given a prize" are passive) - compare active; of a grammatical construction: containing a passive verb form.

formative. Of an affix or other word element: used in word formation or inflection.

form. One of the different aspects a word may take as a result of inflection or change of spelling or pronunciation (obsolete, participial, or verbal forms); linguistic form.

formal subject: grammatical subject. A term (as a pronoun) in a sentence that occupies the position of the subject in normal English word order and anticipates a subsequent word or phrase that specifies the actual substantive content (as it in the sentence "it is sometimes hard to do right") - distinguished from logical subject.

logical subject: real subject. The subject of a sentence that expresses the actual agent of an expressed or implied action (as father in "it is your father speaking") or that is the thing about which something is otherwise predicated (as to do right in "it is sometimes hard to do right") - distinguished from grammatical subject.

linguistics; linguistic science: science of language. The study of human speech in its various aspects (as the units, nature, structure, and modification of language, languages, or a language incl esp such factors as phonetics, phonology, morphology, accent, syntax, semantics, general or philosophical grammar, and the relation between writing and speech) - compare philology.

linguistic form: speech form. A meaningful unit of speech (as an allomorph, morpheme, word, phrase, clause, sentence).

grammatical meaning. The meaning expressed by a grammatical ending, word order, or intonation: a grammatical category (as plural, interrogative, subject, superlative); the part of meaning which varies from one form of a paradigm to another (as from plays to played to playing) - compare lexical meaning.

lexical meaning. The meaning of the base (as the word play) in a paradigm (as plays, played, playing) - compare grammatical meaning.

lexical. Of or relating to words, word formatives, or the vocabulary of a language as distinguished from its grammar and production.

lexeme. A meaningful speech form that is an item of the vocabulary of a language. Gives lexemic.

lexicology. The science of the derivation and signification of words: a branch of linguistics that treats of the signification and application of words.

gender: grammatical gender. Any of two or more subclasses within a grammatical class of a language (such as noun, pronoun, adjective, verb) that are partly arbitrary but also partly based on distinguishable characteristics such as shape, social rank, manner of existence (as in/animate), or sex (as masculine, feminine, or neuter) and that determine agreement with and selection of other words or grammatical forms; a membership of a word or a grammatical form in such a subclass; an inflectional form showing membership in such a subclass. Distinguished from natural gender.

natural gender. The phenomena in a language that resemble grammatical gender but are not (the use of the pronoun she in the sentence the girl may do as she likes is an instance of natural gender, since the choice of the pronoun she is not determined by the noun girl but by the actual sex of the person to whom the noun girl refers) - distinguished from grammatical gender.

neuter. Belonging to, connected with, or constituting the gender that ordinarily includes most words or grammatical forms referring characteristically to things that are neither masculine nor feminine (exx a neuter noun, the neuter gender, a neuter ending); neither active nor passive: intransitive--also, restricted to mere existence or state - used of verbs and verb forms; a noun, pronoun, adjective, or inflectional form or class of the neuter gender; the neuter gender.

form class. A class of linguistic forms that can be used in the same position in a construction and that have one or more morphological or syntactical features in common (eg book, hat, going, deceased, little one, and rapidly flowing stream belong to the same form class as shown by the fact that each can be used in the same position in the construction the---is; books and hats belong to the form classes of nouns and plurals; opened and walked belong to the form classes of verbs and of past tenses) - see major form class.

major form class. Any one of the parts of speech in traditional grammar (as noun, verb, or preposition).

form. To have (as a tense) expressed (eg forms the past tense in -ed); to combine to make (a compound word); to make up: constitute (form a clause or sentence).

genitive. Of a grammatical case: marking typically a relatively close, unchanging, and exclusive relationship such as that of possessor or source (eg the words ending in 's in the phrases the boy's shoes, the sun's light, the speaker's arrival, and the member's expulsion from the club are in the genitive case) - compare possessive; of a word or word group: not characterized by case inflection but nevertheless expressing a relationship that in some inflected languages is often marked by a genitive case - used esp of English prepositional phrases introduced by of (eg the phrases of the sun in "the light of the sun" and of the speaker in "the arrival of the speaker" are genitive phrases; of or relating to the genitive case (eg a genitive ending); a genitive case; a genitive word or word group. Gives genitival: possessing genitive form: relating to or derived from the genitive case (eg anyways, needs, backwards are genitive adverbs).

genitive absolute. A construction in Greek in which a noun or pronoun and its adjunct both in the genitive case form together an adverbial phrase expressing generally the time, cause, or an attendant circumstance of an action (as Kononos strategountos in taut' eprachthe Kononos strategountos "this was done when Conon was general").

paradigm. An example of a conjugation or declension showing a word in all its inflectional forms; a set of forms peculiar to a verb, noun, pronoun, or adjective.

conjugation. A presentation in some prescribed order of the inflectional forms of a verb; a verb inflection; a class of verbs having the same type of inflectional forms (eg the strong and the weak conjugations; the Latin second conjugation with its infinitive ending -ēre); any of several sets of inflectional forms belonging to a verb esp in Sanskrit and the Semitic languages including the forms of the simple verb and various derivative sets of forms that typically add to the meaning of the simple verb a passive, reflexive, causative, intensive, frequentative, or desiderative meaning. Gives conjugate: to give in some prescribed order the various inflectional forms of: inflect - used esp of a verb, rarely of a preposition.

mood. A distinction of form in a verb to express whether the action or state it denotes is conceived as fact or in some other manner (as command, possibility, or wish). (eg the Latin verb has person, tense, number, mood, and voice); a set of inflectional forms of a verb that express whether the action or state it denotes is conceived as fact or in some other manner (eg the indicative, imperative, subjunctive, and optative mood); the part of the meaning of a verb form that consists of the expression of whether the action or state it denotes is conceived as fact or in some other manner; a verb phrase that includes a modal auxiliary.

modal. Of, relating to, or constituting a grammatical form or category characteristically expressing some modification of the predication of an action or state; of, relating to, or constituting a grammatical case that denotes manner.

modal auxiliary. A verb or a grammatical form resembling a verb that is characteristically used with a verb of predication and expresses a modal modification (as can, shall, will, must, might, ought, could, should, would, need, may, dare) and that in English differs formally from other verbs in lacking -s, -ing, and past-tense forms and shares with other auxiliaries the affixing of negative -n't.

auxiliary. Of a verb: accompanying a nonfinite verb form that expresses the main verbal meaning of its clause, expressing typically such things as person, number, mood, and tense, and finite in form unless accompanied by another auxiliary verb, in which case only one is finite (as be, have, do, will, can, in such expressions as "we were standing there", "I move the nominations be closed", "he has been informed", "where do they live?", "he will write", "I can swim"); an auxiliary verb.

adjunct. A word or word group that qualifies, amplifies, or completes the meaning of another word or other words and is not itself one of the principal structural elements in its sentence (eg in the sentence "most children eat heartily", most is an adjunct to the subject children, and heartily is an adjunct to the predicate verb eat). Gives adjunctive. Gives adjunction: joining on or adding of a person or thing (eg improve a sentence by an adjunction of a word).

finite. Of a verb or verb form: showing distinction of grammatical person and number esp in agreement with a subject form (eg the finite verb runs in he runs fast).

infinite. Of a verb form: having neither person, number, nor mood.

infinitive. An infinite verb form normally identical in English with the first person singular that performs certain functions of a noun and at the same time displays certain characteristics (as association with objects and adverbial modifiers) of a verb and is used with to (as "to err is human"; "I asked him to go") except with auxiliary and certain other verbs (as "he can see"; "let me go"; "no one saw him leave").

subject: subject term. A word or word group denoting that of which something is affirmed or predicated: a term that is construed with or without modifiers as the nominative of a verb and is grammatically either a noun or a word, phrase, or clause used as a noun equivalent.

predicate. The part of a sentence or clause that expresses what is said of the subject and that usually consists of a verb with or without objects, complements, or adverbial modifiers; belonging to the predicate, specif completing the meaning of a copula or link verb (eg predicate noun or adjective).

predicate nominative. A predicate noun or pronoun in the nominative or common case completing the meaning of a link verb (as consul in "Caesar consul erat" or "Caesar was consul"). Gives predication: the expression of action, state, or quality by a grammatical predicate.

link verb: linking verb. A verb (as be, become, seem, feel, grow) that connects a predicate with a subject: copulative verb.

copula. The connecting link or relation between the subject and predicate of a strictly formulated proposition, esp such a link when it is a form of the verb to be (as in "he is a shoemaker" instead of "he makes shoes") - see be, predicable; a linguistic form that links a subject with its predicate and sometimes has some additional meaning of its own (as looks in "that looks good", got in "he got sleepy") and sometimes not (as is in "that is right"). Gives copular.

copulative. Of a conjunction: joining together coordinate words or word groups and expressing addition of their meanings (eg and in "bread and meat" is copulative) - contrasted with disjunctive; containing words or word groups joined together by a copulative conjunction (eg copulative sentences); of a verb: being a copula; of a compound: belonging to the dvandva class; a copulative conjunction; a compound belonging to the dvandva class.

dvandva (from pair, couple, two). A class of compound words having two immediate constituents that are equal in rank and related to each other as if joined by and: a compound word belonging to this class (as bittersweet, secretary-treasurer, sociopolitical) - see copulative.

pronoun. A word belonging to one of the major form classes in any of a great many languages that is used as a substitute for a noun or noun equivalent, takes noun constructions and is declined; refers to persons or things named, asked for or understood in the context, and has little or no fixed meaning except one of relation or limitation; pronominal.

KINDS OF PRONOUNS:

adjective pronoun. One that can be used either as an adjective or pronoun. They include the demonstratives, indefinites, distributives, and reciprocals.

adverbial pronoun. One that can be used either as an adjective or pronoun, as where, whither, &c.

demonstrative pronoun. One that points out specifically.

distributive. One that points out objects to be taken singly.

emphatic pronoun. One that denotes emphasis.

indefinite pronoun. One that defines generally.

interrogative pronoun. One used in asking questions.

personal pronoun. One that shows by its form position.

possessive pronoun. One denoting possession.

reciprocal pronoun. One indicating a mutual relation.

reflexive pronoun. One used after a transitive verb to denote the same person or thing as the subject.

relative pronoun. One that acts both as a pronoun and as a conjunction.

STANDARD SIMPLE PERSONAL PRONOUNS

	SINGULAR	
1st person	2d person	3d person
I	you	he, she, it
(mine)	(yours)	(his)(hers)(its)
me	you	him, her, it
	PLURAL	
we	you	they
(ours)	(yours)	(theirs)
us	you	them

The pronouns in parentheses normally do not show possessive-case relation but function nominatively (as mine in "mine is on the table" and "this book is mine") or objectively (as mine in "bring me mine" and "he mistook his coat for mine"). The forms my, our, your, and their are possessive adjectives, as are also his, her, and its when used to modify nouns.

pronominal. Of, relating to, or constituting a pronoun; resembling a pronoun: having a meaning that resembles that of a pronoun in identifying or specifying without describing (eg the adverb here is pronominal in come here); a pronominal.

complement. An added word by which a predication is made complete (as president in "they elected him president" or white in "he painted the house white").

concessive. Denoting concession (eg the concessive conjunction though; a concessive clause introduced by although).

antecedent. A substantive word, phrase, or clause referred to by a pronoun, typically by a following pronoun (as John in "I saw John and spoke to him" or that he is is in "I hear that he is ill and it worries me"); any word or group of words replaced and referred to by a substitute (as at the meeting in "I looked for him at the meeting but he wasn't there"). Gives antecedental.

agent noun. A noun denoting the performer of an action (as writer, inspector, patron, hanger-on).

agentival. Expressive of an agent or of agency: denoting the performer of an action (eg agentive nouns, an agentive suffix).

agent.

or noun equivalent (as a pronoun, phrase, or absolute adjective) (eg in "the good die young" good is a substantive); a categorematic term; betokening or expressing existence (eg the substantive verb is the verb to be); having the nature or function of a grammatical substantive (a substantive phrase); relating to or having the character of a noun or pronomial term in logic: categorematic - contrasted with adjective. Gives substantival.

substantive expression. A word or combination of words that functions as a substantive.

substantive genitive. A genitive that includes in its denotation the meaning of a qualified noun to be understood with it (eg in "I spent the night at my brother's" brother's is a substantive genitive carrying the implication "residence").

substantivate: substantivize: substantize. To convert into or use as a substantive (eg an adjective can easily be substantivized).

partitive. Of, relating to, or denoting a part (eg a partitive construction); serving to indicate that of which a part is specified (eg partitive genitive); of, relating to, or constituting a grammatical case (as in Finnish) that denotes part of something; a word expressing partition or denoting a part; the partitive case in a language; a word in the partitive case.

part of speech. A traditional class of words distinguished according to the kind of idea denoted and the function performed in a sentence: major form class - compare adjective, adverb, conjunction, interjection, noun, preposition, pronoun, verb; a word belonging to a particular part of speech.

particle. A unit of speech serving almost as a loose affix, expressing some general aspect of meaning or some connective or limiting relation, and including the articles, most prepositions and conjunctions, and some interjections and adverbs; an element that resembles a word but is used only in composition: a derivational affix (eg un- in unfair and -ward in backward are particles); (one of the minor uninflected parts of speech).

KINDS OF PARTICLES:

adverb.

conjunction.

absolute adversative. A conjunction used where there is simple opposition of the same attribute to different subjects, or of different attributes in the same subjects, or of different attributes in different subjects.

adequate adversative. A conjunction used of events and their causes or consequences, and indicating a sufficient condition for the conclusion.

adversative. A conjunction indicating a contrast.

causal. A conjunction indicating a cause or reason, or effect or inference.

collective. A conjunction subjoining effects to causes.

comparative adversative. A conjunction that marks the equality or excess of the same attribute in different subjects.

connective. A conjunction that connects the meaning of sentences.

continuative. A conjunction that consolidates sentences into one continuous whole.

copulative. A conjunction which only couples sentences.

disjunctive. A conjunction which does not connect the meaning of sentences.

inadequate adversative. A conjunction indicating an insufficient condition for the conclusion.

positive. A conjunction used to imply necessary connection and existence.

simple disjunctive. A conjunction that disjoins and opposes indefinitely.

suppositive. A conjunction used to imply necessary connection, but not to assert existence.

inseperable prefix. Prefix never used as a seperate word.

interjection. A word used to express emotion.

preposition. A word used to connect words, and indicate their relations.

apposition. A grammatical construction that consists of two nouns or noun equivalents referring to the same person or thing, standing in the same syntactical relation to the rest of the sentence without being joined to each other by a coordinating conjunction, and typically adjacent to each other (as the poet and Burns in "a biography of the poet Burns", my sister and Jane in "this is my sister Jane", John and a bashful child in "John, a bashful child, was afraid of strangers", or the fact and that he is rich in "the fact that he is rich is obvious"); the relation of one such a pair of nouns or noun equivalents to the other, esp of the second to the first.

appositive. Standing in grammatical apposition (eg an appositive noun): being a grammatical apposition (eg an appositive construction); of an adjective or adjective equivalent: standing in relation to its noun like that of the second noun or noun equivalent to the first in an apposition (as shy and embarrassed in "the child, shy and embarrassed, said nothing") - compare adherent, attributive, predicate; an appositive noun, noun equivalent, adjective, or adjective equivalent.

adherent. Modifying a noun and standing before it (eg busy in "a busy street", tomato in "tomato soup", down in "the down train", pay-as-you-go in "a pay-as-you-go plan" are adherents) - compare appositive, attributive, predicate.

attributive. Of an adjective or adjective equivalent: joined directly to a modified noun without a copulative verb and in English usu preceding the noun (as of red in red hair, city in city streets, militant in the church militant) but in some other languages (as French) typically following it (as moderne in un roman moderne "a roman novel") - compare adherent, appositive, predicate; of or belonging to an attributive adjective or adjective equivalent (eg an attributive position; an attributive function): including an attributive adjective or adjective equivalent (eg an attributive collocation); adjectival - used of a term (eg redness is abstract but red is attributive); an attributive word; esp: adjective, adjective equivalent.

attribute. A word ascribing a quality, esp: adjective, adjective equivalent; that one of the two immediate constituents of an endocentric compound or construction that does not have the same grammatical construction as the whole (as this in this paper, completely in completely new, black in blackbird) - opposed to head.

adjectival. Of or belonging to an adjective: functioning as an adjective: adjective (eg an adjectival phrase). Gives adjectivally.

adjective. Being an adjective: functioning as an adjective (eg an adjective clause): fitting or suitable to an adjective (eg adjective uses of nouns; adjective inflections); a word belonging to one of the major form classes in any of a great many languages, typically used as a qualifier of a noun to denote a quality of the thing named (as brave in "a brave man" or "the man is brave", new in "the new dress" or "the dress is new"), to indicate its quantity or extent (as five in "five cows", every in "every word"), or to specify or designate a thing as distinct from something else (as these in "these wheels") and in many languages declined for gender, number, and case and agreeing in all these respects with the noun it modifies but in English having no such inflections (except for this, plural these, and that, plural those); to make an adjective of: furnish with an adjective or adjectives: adjectivize.

KINDS OF ADJECTIVES:

article. Adjective serving to reduce a noun, from a general to a particular
  definite article. One pointing out some definite object.
  indefinite article. One pointing out one object but not which one. The definite article is the, the indefinite a or an.

common adjective. One not derived from a proper name.

compound adjective. One made up of two or more words.

definitive adjective. One that defines or limits the meaning of a noun.

derivative adjective. Formed by adding to a noun, an adjective, or a verbal stem a suffix (-en, -fold, -ful, -ish, -less, -ly, -some, -y, -able, &c; hyphen plus -ed).

descriptive adjective. One expressing some quality or condition of a noun (kind, condition, state) but classless.

exclamatory. What! and what a!

indefinite adjective. A, an; all; any; this; that and the other; every; some; many, many a, a great many; another; much; more; little, a little; less; few, a few; enough; several; sundry; divers.

intensifying adjective. Intensifying the force of a preceding noun or pronoun, making it emphatic: myself, ourself (ie myself), thyself, yourself, himself, herself, itself, ourselves, yourselves, themselves, oneself, one's self.

interrogative adjective. What, which.

limiting adjective. Without expressing any idea or kind or condition, limits the application of the idea expressed by the noun to one or more individuals of the class, or to one or more parts of a whole (eg this boy, these books).

numeral adjective. Indicates number.

cardinal numeral adjective. Counting (eg three dollars, four dollars, 55, &c).

indefinite numeral. One expressing number indefinitely: many, few, &c.

indefinite quantitative. One expressing quantity indefinitely: great, little, &c.

multiplicative. One answering the question "How many fold?": single, double, &c.

ordinal numeral adjective. Denote position or order in a series: the first, second, third, last day of the month.

partitive. Denotes a part: half, third, &c.

participial adjective. One that has the form of a participle.

possessive adjective. My, thy, his, her, its, our, your, their. Often used, not to express possession, but to convey the idea of appreciation or depreciation. (eg "He knows his Shakespeare").

proper adjective. One derived from a proper name; often do not denote a kind or condition, but are limiting adjectives, identifying a being or thing (eg "a Harvard student").

pronominal adjective. One that may be used either as a pronoun or adjective.

ADJECTIVE - ASSOCIATED WORDS:

comparative. The form expressing the greater or less degree of a quality.

comparison. Change of adjectives to denote variation of quality.

positive. The simple form of an adjective.

superlative. The form expressing the greatest or least degree of a quality.

adjective equivalent. A word or word group that is not an adjective but has the noun-modifying function of an adjective (as music in "music teacher", dancing in "dancing teacher", John's in "John's dog", on the wall in "the picture on the wall", the doctor in "my friend the doctor", who plays golf in "who plays golf").

adjunct. A word or word group that qualifies, amplifies, or completes the meaning of another word or other words and is not itself one of the principal structural elements in its sentence (eg in the sentence "most children eat heartily", most is an adjunct to the subject children, and heartily is an adjunct to the predicate verb eat).

adjunction. A joining on or adding of a person or thing (eg improve a sentence by adjunction of a word). Gives adjunctive: having the quality of joining: forming an adjunct.

objective complement: adjunct accusative. A noun, adjective, or pronoun used in the predicate as complement to a factitive verb or a verb of choosing, naming, thinking and as qualifier of its direct object (as chairman in "make John chairman", angry in "make him angry", and red in "paint his nose red").

objective. Relating to, characteristic of, or being the case which follows a verb used transitively or a preposition: being the case that denotes the relation of object; also: relating to the relation itself; expressing a relation that resembles that of an object to its verb (eg the objective genitive member's in "a member's expulsion from the club"); taking an object or noun complement - used of an adjective or adverb (as worth in "worth his salt" and like in "like his mother") and of a transitive verb in contrast to an intransitive verb.

accusative: accusatival. Of a grammatical case: marking typically the direct object of a verb (as Latin filium in "mater amat filium" ("the mother loves her son"); German mich in er sieht mich "he sees me") or the object of any of several prepositions (as Latin eos in ad eos "toward them"; German den stuhl in ohne den stuhl "without the chair") - used esp in the grammar of those Indo-European languages that have relatively full inflections; of a word or word group: being the direct object of a verb or the object of a preposition even when this relation is not marked by any inflectional element (as Robert in "John met Robert") - not now used technically; of or belonging to the accusative case (eg an accusative ending); the accusative case of a language or a form in the accusative case.

accusative absolute. A construction in German consisting of a noun in the accusative case joined with a predicate that does not include a finite verb and use capable of being construed as the modifier of the principal verb in its sentence (as den hut in der hand in den hut in der hand ging er ins haus "hat in hand he went into the house"); a construction in English, esp colloquial English, consisting of a pronoun in the accusative case joined with a predicate that does not include a finite verb and otherwise identical with the nominative absolute (as him being my friend in "him being my friend, I granted his request").

accusative-dative. Of a case of English pronouns: marking typically the object of a verb (as me in "he saw me", him in "I gave him the book") or of a preposition (as us in "with us").

subjective. Being or relating to a grammatical subject; specif: nominative.

subjective complement. A grammatical complement relating to the subject of an intransitive verb (eg in "he had fallen sick" sick is a subjective complement).

subject-predicate. Of, relating to, characterized by, or taking the form of analysis into subjects and predicates analogous to the basic grammatical structure of the Indo-European languages (eg subject-predicate logical structure).

subject substantive. A simple grammatical subject.

subjunction. Something subjoined (eg a subjunction to a sentence).

subjunctive. Of, relating to, or constituting a verb form or set of verb forms that represents an attitude toward or concern with a denoted act or state not as fact but as something entertained in thought as contingent or possible or viewed emotionally (as with doubt, desire, will) (eg the subjunctive mood; bless in "God bless you" and write in "I suggest that he write a letter" are subjunctive verb forms) - compare imperative, indicative; the subjunctive mood, also: a verb or verb form denoting it; subjunctive equivalent.

subjunctive equivalent. A verb phrase formed in English with a modal auxiliary (as shall, should, may, might) and functioning in a manner comparable to the subjunctive mood.

subjunctive mood. This form represents something as not actually belonging to the domain of fact or reality, but as merely existent in the mind of the speaker as a desire, wish, volition, plan, conception, thought; sometimes with more or less hope of realization, or, in the case of a statement, with more or less belief; sometimes with little or no hope or faith.

indicative mood. This form represents something as a fact, or in close relations with reality, or in interrogative form inquires after a fact (eg a fact: The sun rises every morning; in close relation to reality: I shall not go if it rains).

imperative mood. This form is the mood of command, request, admonition, supplication, entreaty, warning, prohibition. It has many forms.

simple imperative. Eg Go! Run!

optative. Of, relating to, characterizing, or being a mood of verbs in Greek or other languages that is expressive of wish or desire and various related distinctions; characterizing or being a sentence that is expressive of wish or hope and marked as optative by the subjunctive mood and by word order (as in Heaven help him); the optative mood; a verb or verbal form denoting the optative mood.

superlative. Belonging to or constituting the degree of comparison that is usu expressed in English by placing most before an adjective (as most beneficial) or adverb (as most fully) or by suffixing -est to it (as oldest, soonest) and that typically denotes an unsurpassed or extreme level of the quality, quantity, or relation expressed by the adjective or adverb (eg the superlative degree; the irregular superlative forms farthest and worst - compare comparison, comparative, positive; the superlative degree of comparison in a language; a superlative form of an adjective or adverb.

ablative. Of a grammatical case: expressing typically the relations of seperation and source (as Latin metu in liberari metu "to be freed from fear"; Latin ea familia in ea familia ortus "descended from that family") and also frequently esp in Latin such relations as cause (as Latin gaudio in exsilire gaudio "to jump for joy"), instrument (as L pugnis in certare pugnis "to fight with fists"), time (as L constituta die "on the appointed day"), place (as L media urbe "in the middle of the city"), accordance (as L meo modo "in my fashion"), specification (as L altero pede in claudus altero pede "lame in one foot"), difference by comparison (as L Ennio in veracior Ennio "more truthful than Ennius"), difference in measure

(as L annis in aliquot ante annis "several years before"), or price (as L pecunia in regna addicere pecunia "to sell kingdoms formoney") - used esp in the grammar of Latin, Sanskrit, Hungarian, and Finnish; of or belonging to the ablative case (eg an ablative suffix); the ablative case or a form of it.

ablative absolute. A construction in Latin in which a noun or pronoun and its adjunct both in the relative case form together an adverbial phrase expressing generally the time, cause, or an attendant circumstance of an action (as acceptis litteris in Caesar, acceptis litteris, nuntium mittit "the letter having been received, Caesar sends a messenger").

ablatival. Connected with the ablative case or any of the relations frequently expressed by it: of or belonging to the ablative case.

causative. Of a linguistic form or set of linguistic forms: expressing cause (eg a causative case, a causative mood), specif: indicating that the subject of a verb causes an act to be performed or a condition to come into being (eg the causative verb fell, meaning "cause to fall"; the causative suffix -en in darken, meaning "cause to be dark"); a causative word or form. Gives causativity.

comparative. Belonging to or constituting the degree of comparison that is usu expressed in English by placing more before an adjective (as more natural) or adverb (as more clearly) or by suffixing -er to it (newer, sooner) and that typically denotes increase in the quantity, quality, or relation expressed by the adjective or adverb (eg the comparative degree; the irregular comparative forms elder and better - compare comparison, positive, superlative; the comparative degree in a language; a comparative form of an adjective or adverb.

comparatival. Of or belonging to the comparative degree.

frequentative. Denoting repeated or recurrent action or state - used of a verb aspect, verb form, or meaning; compare iterative; a frequentative verb or verb form.

iterative. Of a verb form or aspect: expressing repetition of an action - compare frequentative, reduplicative; a word expressing repetition of an action.

classifier. A word or morpheme used with nouns designating countable or measurable objects or with numerals and often indicating a class to which the object designated by the noun is assignable on the basis of shape or function (eg as Japanese hon in empitsu ni hon "two pencils", literally, "pencil two cylindrical-object", or Chinese pen' in san pen shu' "three books", literally, "three origin book").

determinative. Of a compound word: belonging either to the karmadharaya class or to the tatpurusha class; a word belonging to any of several classes differently constituted by different grammarians but typically either consisting of certain uses of the definite article and of demonstrative adjectives and pronouns or including the definite article, demonstrative adjectives, demonstrative pronouns, and some limiting adjectives other than demonstratives; a determinative compound; classifier.

determiner. A word belonging to a group of limiting noun modifers that in English consists of a, an, any, each, either, every, neither, no , one, some, the, that, those, this, these, what, whatever, which, whichever, possessive adjectives (as my), and possessive-case forms (as Joe's) and is characterized by occurrence before descriptive adjectives modifying the same noun (as that in "that big yellow house" or his in "his new car").

case. Of a noun, adjective, or pronoun: an inflectional form indicating the sense relation (as that of subject, object, possessor, thing possessed) to another word in the context; a sense relation to another word in the context of a kind that may be but is not necessarily indicated by a particular inflectional form (eg the subject of a verb is in the nominative case); the characteristic of having inflectional forms indicating the sense relation to another word or words in the context (eg a Latin noun has gender, number, and case). (From Gk ptosis, lit., fall; fr. the idea that cases other than the nominative are like deviations fr. a perpendicular line).

verb. (L verbum word - more at word) A word belonging to that part of speech that characteristically is the grammatical center of a predicate and expresses an act, occurrence, or mode of being and that in various languages is inflected for agreement with the person and number of the subject, for tense, for voice, for mood, or for aspect and that typically has rather full descriptive meaning and characterizing quality but is in some instances nearly devoid of such meaning and quality esp in use as an auxiliary or copula. Gives verbal: of, relating to, or formed from a verb (eg occurs not less than ten times (eight times as a noun and twice in its verbal form); a verbal adjective).

LOGIC DICTIONARY

Pat Gunkel

logic. A science that deals with the canons and criteria of validity in thought and demonstration and that traditionally comprises the principles of definition and classification and correct use of terms and the principles of correct predication and the principles of reasoning and demonstration: the science of the normative formal principles of reasoning: the science of correct reasoning - see formal logic, material logic; a system of formal principles of deduction or inference; semiotic or a branch of semiotic, esp syntactics; the formal principles of a branch of knowledge; a particular mode of argumentation or reasoning viewed as valid or faulty according to its apparent agreement with or departure from accepted principles of logic; relevance or propriety (as of a quality, a procedure) judged as present or absent according to apparent conformity or lack of conformity with the dictates of logic; interrelation or connexion or sequence (as of facts or events) esp when seen by rational analysis as inevitable, necessary, or predictable; something that convinces or proves or that obviates argument or makes argument useless and is by its nature quite apart from or beyond or opposed to the use of reason as a means of arriving at decisions or settling disputes or attaining truth.

logical implication: logical entailment: implication. One of several formal logical relationships or a statement containing propositions in such a relationship - a logical relationship of the form symbolically rendered "if p then q" in which p and q are propositions and in which p is false and q is true or both, also a statement in this form (called also material implication); a logical relationship of the form symbolically rendered "if p then strictly q" in which q is deducible from p, also a statement in this form (called also logical implication, strict implication); the symbol used to indicate one of these two formal relationships and rendered "if...then" or the logical operation implicit in one of them.

logical subject. The subject of a sentence that expresses the actual agent of an expressed or implied action (as father in "it is your father speaking") or is the thing about which something is otherwise predicated (as to do right in "it is something hard to do right") - called also real subject.

remotion. The process of reaching or defining a conception by the successive elimination of what is extraneous.

remotive proposition: privative proposition. Esp one that asserts the absence of something to be of the essence of the subject.

adversative. Expressive or indicative of antithesis, opposition, adverse circumstance, reservation, or contrary suggestion (an adversative proposition; the adversative conjunctions but, only, still, yet; an adversative clause such as although it was raining in "although it was raining, the race started").

exceptive proposition. Has the subject limited by exception: "except", "but", "some".

exclusive proposition. Eg "only", "alone".

reduplicative proposition. Eg "as", "inasmuch as ", "sofar as".

causal proposition. Eg "because", "since", "by reason of", "on account of", "hence", "thus", "so", "for".

contrary. A proposition so related to another that although both may be false they cannot both be true: a universal proposition affirming what another universal proposition denies or denying what another affirms (as "every vine is a tree" and "no vine is a tree") - distinguished from converse; compare opposition.

contrariety. The relation of contraries - see opposition.

contradictory. A proposition so related to another that if either of the two is true the other must be false and if either is false the other must be true: a proposition having the same terms as another proposition but opposite in quality and quantity (eg "all a is b" is the contradictory of "some a is not b"); a term that is the exact negative of another (eg "white" and "not white" are contradictories).

- Gives subcontrary

subcontrariety. The relation existing between subcontrary propositions: the relation of two propositions with identical terms which is such that both may be true but both cannot be false - see opposition.

disjunction. The relation of the terms or clauses of a logical proposition or judgment expressing alternatives; a statement of such a proposition usu taking the form:
inclusive disjunction. p v q meaning p or q or both.
exclusive disjunction. p + q meaning p or q but not both.

conjunction. A statement that is true only if both its statements are true - called also joint assertion; the binary connective used in logic; the logical operation of forming a conjunction.

binary. Relating two arguments or terms (of functions and propositions) (eg a binary relation).

copula. The connecting link or relation between the subject and predicate of a strictly formulated proposition, esp such a link when it is a form of the verb to be (as in "he is a shoemaker" instead of "he makes shoes").

epicheirema. A syllogism in which some statement supporting one or both of the premises is introduced with the premises themselves.

enthymeme. (lit. to keep in mind, consider) An argument or truncated syllogism in which one of the propositions, usu a premise, is understood but not stated (as we are dependent; therefore we should be humble); Aristotelianism: a rhetorical syllogism which is probable and persuasive but may not be valid. Gives enthymēmatic.

extension: denotation.

intension: connotation. (Eg the intension of "triangle" implies or includes that of "plane figure") - contrasted with extension.

sorites. (lit. heap) An abridged form of stating a series of syllogisms in a series of propositions so arranged that the predicate of each one that precedes forms the subject of each one that follows and the conclusion unites the subject of the first proposition with the predicate of the last proposition - compare Goclenian sorites.

goclenian sorites. A sorites in which the order of the premises is reversed.

relation. A logical bond, specif a dyadic or polyadic predicate or propositional function - compare asymmetric, intransitive, irreflexive, one-one, reflexive, symmetric, transitive.

symmetric. Being of such nature that the terms may be interchanged without altering the value, character, or truth - used esp of mathematical relations, functions, and equations (eg c=f(a+b) is symmetric with respect to a and b but not generally with respect to a and c).

asymmetric. So constituted as to never hold when related arguments are interchanged (as in the relation x is the father of y).

transitive. Passing or leading successively on to members of a class or a series of developments, specif of or relating to a logical relationship between x, y, and z such that if x has a specified relationship to y and y to z then x has this relationship to z.

intransitive. Characterizing a logical relationship between the three statements x, y, and z that occurs when x is related to y as y but not x is related to z.

reflexive. Of a relation: existing between an entity and itself (eg identity is a reflexive relation; all members of a class are in reflexive relationship with one another).

irreflexive. Of a relation: never relating a term to itself.

one-one. Of a relation: constituted so that if one thing is given only one thing can be the other term (eg in a monogamous society the relation "husband-wife" is one-one).

one-many. Of a relation: constituted so that if the first term is given any of many things can be the second term whereas if the second term is given only one thing can be the first term (eg the relation "father-child" is one-many) - compare one-one, many-one.

many-one. Of a relation: constituted so that if one term is given only one thing can be the second term whereas if the second term is given any of many things can be the first term (eg the relation "sired-by" is many-one since many offspring may be sired by one animal but each offspring has only one sire).

opposition. The relation that occurs between two propositions in logic having the same subject and predicate but differing in quantity, in quality, or in both and that is usu considered to occur in the four forms of contrariety, subcontrariety, subalternation, and contradiction.

subalternate. A particular logical proposition that follows with immediate inference from a universal one of like quality and identical terms - see opposition.

subaltern. 1 A subaltern proposition: a logical subalternate; particular with reference to a related universal or general (eg "some S is P" is a subaltern proposition to "all S is P").

subaltern genus. A logical genus that may be a species of a higher genus (eg the genus book is a subaltern genus since it is also a species of the genus printed matter) - compare tree of porphyry.

superaltern. A universal proposition in traditional logic that is a ground for the immediate inference of a corresponding subalternate.

MENTAL MECHANICS

Pat Gunkel

I think that I have explained the brain. But the explanation is constituted, to a considerable extent, by bundles of alternate hypotheses in the area of different problems. The rough outline of the mind's function I think I can set forth, while the other things remain to be ironed out. It is the purpose of this presentation to provide the rough outline in the absence of study of the details of my work.

My first object will be to introduce you to some of the gross and simple features of the brain of which familiarity is necessary to sympathize with what I will then have to say.

(Extemporize.)

For an explanation of the brain to make sense it is necessary to know in advance of the set of problems whose convincing solution would qualify an overall explanation as true. A list of such problems would undoubtedly include

(1) Memory,
(2) Thought,
(3) Emotion,
(4) Action,
(5) Consciousness,
(6) Human intelligence,
(7) Perception,
(8) Mental development, and
(9) Will

as broad categories hitherto practically unsolved. What are some of the subproblems comprised in each of these categories?

(Extemporize.)

Thus it is obvious that an immense task walks in hand with any attempt to explain the mind of the brain. Nevertheless, at the conclusion of this paper I expect to have run the gauntlet and emerged alive.

(Lemmata:)

(1) 20 dimensions of differences between brains and current computers.
(2) 44 integral categories of design of cerebrocortex.
(3) By way of example, 35 possible explanations for one category: the cell column.
(4) Real and possible variations in the architecture of neurons: many drawings.
(5) Description of the neuron.
(6) Possible bases of intracellular memories.
(7) Antioblivescent processes.
(8) Nervous representation of a perceived line.
(9) Action as perception and perception as action.
(10) Synecdochic processes.
(11) An active metric.
(12) Contrahabituation and stabilization pairing and interruption.
(13) Quantification of difficulty.
(14) Detail through generality.
(15) Alternation.
(16) Pit foci.
(17) Sifting and defoliation.
(18) Descending inhibition.
(19) Automodulation. (of information, of area, by reduction of or reversal of [illegible], passive vs. active, partial vs. total, [illegible] vs. [illegible], complex vs. simple, serial vs. parallel, static vs. progressive, informational vs. [illegible], universal vs. restricted; area vs. cellular, etc., [illegible] vs. [illegible])
(20) Drones.
(21) Loops and toboggans.
(22) Transistentialism.

(23) The direction of nervous evolution.
(24) Comparisons between man and other large-brained animals: 15 differences from whales.
(25) Speculations contributing to a theory of 'progression'.
(26) Empty sets.
(27) Our ignorance about the brain.
(28) Man might be the product of accelerated evolution: composite change.
(29) Characteristics of the brainstem.
(30) Tropogeny and statolysis.
(31) Types of intraneural familiarization.
(32) Transcurrent control.
(33) Motognostic order; list of actions.
(34) Nuncocentry.
(35) Prefrontal lobule.
(36) 3 possible origins of the spirit.
(37) 'Perfect cortex' and other idealizations.
(38) Koniocortex.
(39) Geometric scenes.
(40) 'Curves'.
(41) Thymognosia; list of the emotions.
(42) Polities.
(43) The nervous system as a: hierarchy, continuum, chain, behavioral framework, "X", and pile of equilibria of all different sizes, shapes, and kinds that are interrelated in trees, matrices, and nets.
(44) Chain: oligarchy, oligopoly, oligopsony, duopoly, duopsony, monopoly, monopsony, duumvirate, plutocracy, timocracy, direct democracy, representative democracy, plenocracy, plurality system, rotating system, bloc system, specialized society, burocracy, anarchy, totalitarian and/or fixed system within these, communism, &c or any possible mixture.
(45) Thignognosia.
(46) 18 hypotheses on conception: complicated prediction, retrospective analysis, competitive prediction, ascending elegance, competitive disengagement, continual prediction, relative continuity, redintegrative abstraction, higher-order curvature, anamorphosis, algebraic quasiexclusion or redimensionalization, alternative clustering for hyperplanar semiselection and late exclusion, alternative interexclusion, multiseriation, operational devolution, directed satisfaction, and attributive reassociation.
(47) Random schemata.
(48) Parallel cognition.
(49) Types of decisional trees, eg air plant.
(50) Serialism, seriparallelism, paraserialism, and euparallelism.
(51) Beyond serialism versus parallelism.
(52) Importance of language to intelligence.
(53) Homogeneities of textural universes.
(54) Resonance.
(55) Basis of closure: turnings.
(56) Densiform analysis.
(57) Perceptual minima.
(58) Contradifferentiation.
(59) The analysis of IQ tests.
(60) Competitive hologNosia.
(61) Function of the limbic system.
(62) Comments on experiments in visual perception: transitions in contrast, intensity, focus, time, thematic complexity, &c.
(63) External and internal operations of niduli.
(64) Interference, Fourier theory, &c.

(65) Aspects of a scene useful in recognition.
(66) Grammatic and semantic problems and their special solution.
(67) Importance of invariants in art.
(68) Nature of music.
(69) Audiognosia.
(70) Eyemotions in the newborn; eyemotions in the adult; eyemotions in the schizophrenic.
(71) Isointeractions.
(72) Germinal oculokinetic clusters.
(73) Neural hysteresis or horology.
(74) Chronognosia.
(75) Possible explanations for assigned receptive properties of neurons.
(76) Isopores, [illegible] and thin branchless stems into crowns above canopy.
(77) Darwinian principles.
(78) Order in experience: the 71 types of primary order, 5,041 types of secondary order, 357,911 types of tertiary order, nth order, and rings.
(79) Applications of these orders to the analysis of pictures, &c.
(80) Random continua: 16 consequences.
(81) Problems of recognition: metasize, metaintensity, metalocation, metaorientation, metaclarity, metastability, metavariety, metapopulation, metacolor, metasetting, metamotion, and metatime.
(82) Allocative boxes.
(83) Condivergence.
(84) Diconvergence.
(85) Roles of eyemotions.
(86) Chronesthesia.
(87) Temporal consignification.
(88) Incandescence.
(89) Immolation; debouchment.
(90) Innumerable hypotheses about the hippocampus.
(91) Possible schemes for the materialization of memories.
(92) 26 possible neural substrates of behavior.
(93) Climbing.
(94) 68 pure possible systems of mnemic classification.
(95) Theories of cerebellar function.
(96) A proposed computer simulation of striate neuronal monocellular and multicellular recognition of formal events.
(97) Partitioning.
(98) Memory hypotheses: 13.
(99) The history and many histories.
(100) The test of an explanation.

* The ~~[illegible]~~ quantification of "difficulty quantifiability" gives an important metric.

* "Succession": Successive complexities of recognition may leave behind progressively simple, adequate, & deeper entries able to work simultaneously in recognition (eg. [illegible] "anamorphic" integration?). Also, progressive recognition may work in many equivalent directions simultaneously (by "[illegible]").

THE PURPOSES IN WRITING THIS BOOK

Pat Gunkel

(1) To explain the brain. To explain it completely, partly, basically, importantly, much more, virtually (eg so that it could be seen as explicable, mechanical, determinate, dangerous, controllable, powerful, complex, holistic, indeterminate, organic, imitable, extensible, transcendable), &c. To explain the mind (as greater and lesser than the brain).
(2) To test myself. To test my ardor, persistence, ability, limits, sanity, style, self-control, ideas, and purposes. To test those (suppositive but unpretentious) boasts I had made about myself and man.
(3) To do anything at all. To do something challenging, interesting, useful, lucrative, publicizing, grand, important, infinite, self-developing, self-steeling, multilaterally self-developing, self-demonstrative, blending poetry and science, futuristic, in hard science, bridging theory and application, world-transformative, decisive, complex, expansive of general knowledge, developing my method and style, that would communicate and test the nature of communication, that would leave an effect on the world rather than being trivial and futile, different, "impossible", that would give me unique authority in an (important) area, &c.
(4) To quantum-jump an entire field and show that such could be done.
(5) To tell the world and scientists what science is about.
(6) To show how science should be done.
(7) To discover how to build minds and superbeings.
(8) To neurologize, mechanize, explain, criticize, redirect, extend, &c psychology and even sociology, philosophy, axiology, &c.
(9) To inspire (the world, friends, family, self).
(10) To fulfil expectations about myself.
(11) To supply pride and order to my family.
(12) To elicit support for my future work and study, my purposes and my life.
(13) To determine the complexity and real simplicity of a science.
(14) To provide--through extensive readings, real mastery, complexity and fullness of thought--clotheslines and a framework for my memory, imagination, intelligence, feeling, consideration, psychology, image to others, complexity of association, creative process, &c in the future in any activity, in any area, with any people, and with any purpose.
(15) To have an instrument for messianic purposes.
(16) To provide a complex, appealing, and hard framework for my book The Future of the Soul
(17) To advance my knowledge of many fields, especially through the impetus of a practical focus (biology, chemistry, psychology, physics, computers, medicine, &c).
(18) To explain man.
(19) To change the mentality of men. To make the world a saner, happier, and wiser place.
(20) To solve a whole bunch of problems and create a whole lot of things at once.
(21) To explain perception, thought, memory, psychology, emotion, purpose, behavior, development, evolution, pathology, self, consciousness, action, ideas, and meaning.
(22) To eliminate the evil in the world.
(23) To provide a true picture of the world to men.
(24) To reanimate men with the purpose of religion.
(25) To win support for the study of the brain, &c. To redefine the justifications for neurology.
(26) To negate erroneous work in artificial intelligence, &c.
(27) To give a new aesthetic world view.

THE PROBLEMS IN READING THIS BOOK

Pat Gunkel

1. The vocabulary is [redacted] large.
2. Many words are invented.
3. Many words are reapplied.
4. The book lacks organization: as it is, it is nonlinear and improgressive.
5. The author is wise from his ignorance: others are ignorant of this wisdom.
6. Theoretic neuroscience is conceived for the first time. There is no readership.
7. Whole batteries of new concepts are used. The form and content of these is often extremely novel.
8. The many concepts form and are initially inseperable from a great web of processes.
9. The territory covered is gigantic and the approach necessarily summary and implicit.
10. The author's mind moves at a very high speed upon equally high trajectories.
11. Many ideas are pursued at once. These ideas may or may not have something to do with each other.
12. The statement is staccato or laborious, peremptory, abstract, contradictory, abstruse, percussive, kaleidoscopic, pointillist, marching, racy, preposterous, unsequential, irrepetitive, &c to a surprising degree.
13. Rare knowledgability is presumed.
14. The style is irreverent, critical, iconoclastic, apocalyptic, unbelievably dense, experimental, "hyper-technical", elliptic, metaphoric, associative, dissonant, and overwhelming. It is the sole nonfiction Finnegans Wake.
15. Many ideas are reapplied, stretched, and put through a fantastic ballet.
16. Synthesis of past neuroscience is implicit: there are few compass points for the consequent reader.
17. The subtlety, integrity, agility, and power of attention presumed is unique.
18. The style is morphologic and clusteral.
19. Ideas are treated in the way of a dynamics instead of statics, whereas the neuroscientific and broader community are sluggish, stuffy, and static.
20. The book must be read by a labor of love and without disturbance. A priori judgments and ideas must be suspended until a notion of the book in its entirety is formulated. Most people cannot do this for the first sentence.
21. The author is unaccredited and suspicious. He—being without medals, titles, positions, associations, norms—is also unglamorous and without authority.
22. The book is large, unpublished, unbound, undecorated, and minus prospect. There is no introduction, no index, no table of contents.
23. There is an unbelievable sea of ideas, a virtual planet of its own.
24. Most people do not understand the methods behind speculation, such things as extrapolations, guesses, approximations, spectra of ideas, hedges, counterbalancing, the importance of intuition, the innecessity of completeness, the equilibria of hierarchies, the redundancy and multiplicity of explanations, the presuppositions of their own ideas, the used and unused power of the mind, the organization of knowledge, the nature of material, the ambiguity of proof, the additional perspectives on and structures of their own knowledge, the biases of tradition, the role of paradigms, the return of speculation into empiricism when speculation is sufficiently complete, the potential and manner of speculation, and the combinatorics of facts.
25. Scientists aren't angels.
26. A leap of imagination and energy comparable to the composition is required and the reader must try to make the ideas work rather than to shoot them down with pistols.
27. The reader must be a certain type &/or he must have character.

A VIEW OF THE WORLD CONSEQUENT UPON MY IDEAS OF THE BRAIN

Pat Gunkel

As originally anticipated, my understandings about likely and possible brain function are full of signifigance for man's view of his own world. Some of these consequences are:

1. Man is untrustworthy in the short and longterm, in the one and the many, and especially in the present and future possible and probable world due to their peculiar setting.
2. Man is defective, limited, determined, &c.
3. Man is with meaning.
4. Man is inspecific.
5. Ideas are inspecific.
6. Motivations, ideas, perceptions, &c are complex and distributed.
7. These things are mysterious.
8. The mystery in the world is indefinitely great, both qualitatively and quantitatively.
9. Man's success is due to his self-transcendence. Man's rate thereof is unnecessarily slow. The dynamic process which is man in his higher meaning is strictly limited by his static mechanisms.
10. Being is above any individual man, organism, moment of time.
11. The natural processes of the world are far more complex than we might suppose.
12. Understanding and mental health require a large and random view of a large and random (or naturally formed and adequate) world.
13. Ignorance about our own natures causes much of our trouble as social and individual beings. This ignorance is unnecessary.
14. The amount of meaning in the world is infinite.
15. "God", a peculiar synthesis of the whole active in the constant organization of behavior, is natural; it is the point where the whole refers to itself in fullest self-transcendence, and it is the idea of continuity amid change and of change amid any continuity.
16. Bizarre unconscious ideas of the world are continually forming owing to variations of underlying motivation, self-ignorance, intrusions of unfortunate motivations, insidious accretions, surprising crystallizations of the entire mind, at the periphery of conscious processes, &c. Peculiar types of behavior are precipitating from these and assuming excessive signifigance.
17. The continual lapsing of the mind into static understandings is turning ephemera, processes, aspects, and machinery into absolutes, wholes, substances, and ultimates in a highly destructive and completely misleading fashion. The world is thus becoming a junkpile of these arbitrary epiphenomena with their arbitrary motivations.
18. No totally specific complex behaviors are inherited in the brain, tho this may be in err. Instead there are indefinite, however strong and peculiar, tendencies that are perhaps similarly worrisome from the standpoint of possible human virtue and the explanation of society.
19. It should not be overly hard and it is not impossible to intervene in man's biological constitution for man's radical benefit and to model machines around the principles derived from a study of the brain wholly doing away with the undesirable peculiarities found in man as a reflection of this constitution. It is easy to design machines zillions of times superior to men as living beings. These machines should inherit the earth.
20. Man's brain has given the world the possibility of absolute progress and absolute appreciation.

21. Ignorance is wise.
22. Simple knowledge is deceptive. Systematic knowledge may be irrelevant: the world has its own system.
23. The brain is naturally concerned with everything and the whole. It is naturally concerned with itself and naturally concerned with "God".
24. Simple percepts and objects are not simple but tell what are in a sense "infinite" stories.
25. Things are fantastically interrelated. Any two things have an extreme similarity.
26. The dimensions of difference between things are common.
27. The world is fantastically ordered. It comprises a "ring" of orders.
28. Moments of time are asymmetric to one another due to the ambiguity of both moments and things and the all-importance of processes that are also open.
29. The truth and beauty of the world lies in its subtlety and this can never be denied.
30. The extremes of the world are similar.
31. The world continually converges into and diverges from itself in a process of eternal self-creation.
32. Man's character is self-created.
33. There are great variations in the character and capacity of men that are partially due to their inborn variations. It is possible to say a great deal about these inborn variations now and far more in the future. These variations have definite signifigance for the character of society.
34. The continuum between man and the animals may or may not be blurred. It is not yet possible to be decisive on man's kind and degree of superiority and the mentality and worth of animals, near and far. Prospects are on the horizon and in time these things will be definite.

THE END OF A STUDY OF THE BRAIN

Pat Gunkel

I am ending my study of the brain and here is why:

1. The initial advantages I had by entering a field quickly with total ignorance in the beginning are passing or passed. I have begun to acquire the stickiness of my own ideas, their presuppositions, and the ideas and data of the field. My enthusiasm caused by a naïve spectacle, and so valuable in seeing things novelly &c, is passing. I now think others can use my ideas better than I. The 'metaphors' and 'textures' I was able to draw on by my experience of things outside this field are exhausted, invalid, confusing one another, inactive, &c.
2. Many general or particular problems that originally excited me do so no longer, eg because I have 'satisfactorily' explained them.
3. The ideas I now have are becoming too numerous and trivial, ironically at the same time as they may appear more profound or be the more interesting, and are pressing too strongly against the boundaries of our ignorance, the maniness of my assumptions, and are drawing too heavily on what little we know or only think we know (double ignorance). I now have too much facility in combining my ideas and manipulating data to suggest hypotheses, and hypotheses maybe increasingly formal.
4. Criteria for explaining the brain, for testing hypotheses, for using ideas, &c are not available. This is too psychologically futile for me to continue it forever.
5. Other interests, intentions, obligations, &c are pressing on me. It is my method to only devote a small period of time to any subject: my best creativity is to do jumping from field to field.
6. My ideas may exist in too intuitive a form. I can not take the time or do not have the ability to document the foundations and evidences for my case and that, differentially, contributed to it originally. The complexity and difficulty of expressing these ideas, at least at this time, may be infinitely greater than that of having explained the brain or a part thereof.
7. There are too many things I could say on too many subjects—not even in a lifetime could I say all that there is to be said. Saying all this, in addition, may be irrelevant. Perhaps only a few men will ever truly understand the brain.
8. I am pressing up against my own ignorance, inabilities, &c. I desperately feel the relevance, parallelism, essentiality, &rc of mathematics, of which subject I am totally ignorant.
9. Many things I could do would apparently be wasted because others would not use, understand, or appreciate them or, just generally, they would not justify themselves. Studies of chemistry, pathology, psychophysics, &c and the preparation of a fabulous atlas are cases in point.
10. It was my intention, often, to just show how things could or might be done or might be and, having done so, not to extend, complete, perfect &rc these things. I was trying to show the dimensions, detail, variety, possible methods, mental style, &c of the field: the book is extremely implicit.
11. It appears that the explanation of the detailed or concrete operation of the brain (which may be exactly what some are explicitly or implicitly looking for) might, in any cases, be too herculean, infinite, complex, incomprehensible, specific, &c to justify the exertions and might not, in itself, constitute either a general explanation of the brain or a proof of anything (eg the specificity might be ambiguous proportionately to its specificity).
12. I find it impossible to choose from among my possibilities. Many people demand such choice. Furthermore, I see that if I make things any more complicated it will simply compound the problem that no one has cared enough to understand what I have already said. Requests given me by people to simplify &c my book seem ignorant or guilty of similar errors.

I undertook in this study to find out the extent of our knowledge and ignorance about the brain. I have seen that we suffer from abysmal ignorance. All we seem to know are scratches on the surface. Here and there there are hints that we know more, eg general views of the brain's overall function, but these hints are illusions. I likewise undertook to see if current knowledge could be better organized, if important theories could be developed out of it, and if it could be used to gain satisfactory comprehension of the mind's function on some level of generality. I found everyone of these latter things to be true. Another objective was to apply what is known and what I could theorize to the problem of whether we can now or in the course of a few years of work build a mind equal of our own, and if so, how. It is premature to answer this question and to say whether I have achieved the second part, and I vacillate in my opinion, but I have surprised myself on how possible these are.

NEW MEANS

1. Scanning electron microscope
2. Enzyme technics
3. Autoradiography
4. Microelectrodes
5. Multibarrel electrodes and collocated electrodes
6. Computers for analysis and simulation, ultimately for synthesis
7. Developments in and applications of mathematics
8. Concepts of what is going on, what to look for, what is needed, how things interrelate, &c
9. Quantitations (eg valid and useful cell and fiber counts)
10. New stains and modifications of old
11. Electronmicroscopic montages
12. Histoflourescent anatomy: new technics applied to new substances on greater scale and in more appropriate way with more skill and better understanding of the results
13. 6-hydroxydopamine (causes degeneration of catecholaminergic systems in the nervous system)
14. Punctate lesions
15. Antigens
16. Analytic methods and representations (eg joint peristimulus-time scatter diagram)
17. Xerography
18. Cell culture
19. Tissue explants
20. Other in vitro methods
21. Innumerable methods of chemical analysis and synthesis (eg of primary, secondary, and tertiary structure of molecues)
22. Stimulation, recording, and observation in unanaesthetized and free animals, in increasingly naturalistic settings
23. Naturalistic experiments
24. Longer (eg full-ontogenic) and shorter experiments and observations
25. Use of higher animals (especially the chimpanzee)
26. Microdissection
27. Freeze-etching microscopy
28. Experimentation in man (patients, defectives, embryos, late irreversible dements, and normals)
29. Experimental pathology in animals and man
30. Evoked potential technics
31. Conditioning (eg operant conditioning of single cortic units for tailored development and interaction, eg as modification of old responses or for the investigation of arbitrary new responses)
32. Revival and extension of old (eg staining-degeneration) methods
33. Comprehensive descriptions (convergence phenomenon)
34. (The live, changing, dynamic, organic, extremal, moving, observed, followed, grown, dying, plastic, balanced, systemic, whole, &c nervous system)
35. Invertebrates and lower animals
36. Species-specific correlations and delimitations
37. Multilevel work (eg lightmicroscopy and electronmicroscopy together)

REASONS FOR EXPLOSION OF NEUROSCIENCE

1. Computers doing work
2. Computers for simulation
3. Instruments, techniques, and methods
4. People - number, quality, and diversity
5. Funding
6. Catching fad
7. Empirical completion
8. Theoretic burgeoning
9. Empirical convergence
10. Theoretic convergence
11. Empirical and theoretic mutual convergence
12. New and true motives and goals
13. Work and convergence at many levels (eg chemical, organelle, unit, groups of units, tissue, macroscopic, whole, systems, psychology, and sociology inter se and even en bloc)

RAISONS D'ETRE FOR NEUROSCIENCE INCLUDE:

1. To understand the basis of our knowledge and to precise and extend that knowledge directly - epistemology.

2. To understand ourselves, ie. our motives, needs, complexions, behavior in history, essences, behaviors, ideas, perceptions, limitations, liabilities, interactions, mundane ideals, potentialities, aspirations, variety, capacity, scope, and form - psychology, aesthetics, ethics, sociology, neurology, &c.

3. Curiosity about a superb mystery.

4. Human replacement, transcendence, and service to the infinite good.

5. To understand the relationship between man's and all other nervous systems; to grasp man's nervous system.

6. To describe and understand animals' nervous systems and behavior.

7. To control man, eg. for human happiness and excellence.

8. To cure, better, and prevent - medicine.

9. New means.

10. Better wedding of industry and the soul - redirected ethos.

11. Time's tremulously compounding problems.

12. Effect of the recentering and extension of science and technology.

13. Human disagreement.

14. Man's desire to dispense with unleisurely work - servant intelligence.

15. Anticipatory prevention of abuse.

16. A new interest in the ratio between our ignorance and knowledge; a velleity for wisdom.

17. Fear for the hell we are building about ourselves and the nursery thing that confronts us in our mirror.

18. A labile desire to unite the beauty of nature with the means of technology; far more than this, a sense of the possible perfection of the future, and of the continuity of all being.

CEREBELLUM

Section II: "The Cerebellum"

Pr:

A THEORY OF CEREBELLAR FUNCTION

Pat Cumel

The cerebellum creates one-dimensional motion or sensorimotor correlation or reinforcement by favoring it. This favors oscillatory motion. The climbing fibers must permit patterned adjustment, eg steering or abrupt correction, and probably began as vestibular but have perhaps been supplemented by other controls. The transverse inhibitory interneurons probably followed and positively enhanced anteroposterior or, more properly, one-dimensional motion. The golgi cell, glomerular, Purkinje-dendritic, and granular proliferation presumably served to create a larger and thus more flexible range. Glomeruli in the nervous system generally are probably intensity controls expanding range, eg as differential amplifiers. The Lugaro cells presumably perfect the one-dimensionality by gathering transverse impulses and inhibiting other inhibitory interneurons longitudinally, thus abetting the parallel fibers. Athetotic torsion presumably reflects defect in eg the climbing fiber adjustors, and choreiform tremor, conversely, equal mossy defect. This would explain choreiform tremor with either caudate overactivity (eg cholinergic, with cortic or other suppression) or removal.

γ((From below)) S; [illegible] of what is and is not the proper perspective, perhaps making one deeply sensible of what is the perspective, a kind of reformative depth.

A THEORY OF CEREBELLAR FUNCTION, Pt 2

Pat Gunkel

The function of the cerebellum is its interest in change. It inhibits the fact of exact pattern given it with input and does so with a slight delay and increases in this fashion the contrast of new input. Later functions added on in evolution, ia, included amplification of changed input, precise mapping of musculatures and coordination, steadily improved and refined, with other senses, eg mapped as to quasi position in cerebrocortic association areas. Presumably the vermis v paravermis served as reciprocals for muscular antagonists. Conceivably the oblong cerebellocortex possesses, more precisely in higher forms, more detailed and precise muscular representation. In the primates folial proliferation perhaps served finer changes and thus finer movements' detection and execution. Contrasignal reticula or tissues may similarly serve to accentuate novelty in recipient and intrinsic cellular activity, and thereby development; the fact that, speaking granularly, different actions and sensa would have variable consequences (just as there is excess regularity or normality in visual form) would favor the reflection in these tissues of resemblant possibilistic patterns which, properly arranged, would lead to the development of the nervous system that we know. There is clearly both warrant and opportunity for commissural exploitation of such a system and one presumes somatotopic or proper-field patterns must have readily emerged; eg the bilaterally symmetric body invited in countless ways eg use of compensatory equilibria in action. Granule cell proliferation may have served, ia, less latency, shorter parallel fibers for finer motion, more branched or spined Purkinjes, Golgi combination (cf infra), more total and sharper trilaminar response, &c. Glomeruli may just be ideal vergent synapses; also precise bisignal places and architectural devices for substantial regularization and uniformization. Golgi cells and Purkinje collateral autoinhibition may have served to make 'rheoception' (the perception of difference and current) (or [illegible]perception) more precise, rapid, and detailed. It seems quite possible the cerebellum has, even inevitably, mechanisms for kinds of short and even lengthy (?permanent? early) memory.

NOTES:

Conceivably the climbing fibers served to charge (ng?) the cerebellar cortex and to override whatever activity characterized the otherwise excited excitory nucleofugals.

The ~200 cps.-cerebellar rhythm may thus after all be important.

Another function of the cerebellum might be to cause the nervous system to assume metastable or dynamic equilibria so that eg standing and walking would occur as that coactivity of centers which produces the greatest switching and indeed the greatest net action of the opposing muscles (at least initially, til balance becomes vibratilely exact and 'poised' as a nevertheless inescapable pattern)*. α (see γ)

*(anticipatory reversal leading to present-future equilibria [illegible] or [illegible] reversal?)

(experienced transform, [illegible] and their elaborate counterings?)

α Somewhat similarly, might the HC or HC systems, [illegible] the passage or transformations of time, function [illegible] to force experience/[illegible] to systematic but [illegible] changes in hypothetical experience, so to force the perpetual mutation of perspective [illegible]

FUNCTIONS THAT MIGHT HAVE BEEN SERVED BY THE CEREBELLUM

Pat Gunkel

It is worth speculating what the cerebellum might do. I shall begin with a transcript of a note.

The cerebellum (eg 'like' the colliculi & geniculates) would seem a perfect means for comapping polysensory & polymotor points but esp for learnedly creating an unequal but functional distribution of modal & point emphases, a redistribution, control, complication, & progressive replacement of reflexes; its parafoliar parallel fibers (as in the central cerebrocortex) are just what one would expect, since this axis is redundant (perhaps combinatory—perhaps irredundantly between the collateral strips; the widening of the cerebellum could serve the interposition of strips, the complication of operations & possibilities, & new relations; the lengthening adding or seperating elements &/or complicating operations); the purpose of the cerebellum then need only be some & better sensorimotor topic laterointeraction & conjunction, the panmodal comapping, or-& any-punctal 'gestalt' learning or a functional & filtrant map.

The phylogenesis of inhibitory cells may be taken to serve efferent, afferent, &/or 'self' inhibition, in the complicated case where the sole efflux of the cerebellocortex is inhibitory & thus inverse, in the complicated ways that various temporal modulations are comprehensible and the effect of both the internal & effluent inhibition may net or complement increased excitation. Exx, the pattern of gramular cell & parallel fiber excitation may be spatially & temporally modulated by the various inhibitory cells to alternate circuits &/or do computation, & the Purkinje output may be temporally sharpened. In any case, all cerebellar elaborations & innovations may be quantitative phylogeny beginning with an elementary & tiny prototype in cyclostomata.

Possibly centromuclear flow-thru excitation is variably modulable by switching and modulation in the more complicated cerebellocortex (how typical & relatively important are collaterals of cerebellar afferents), in which case that cortex could serve the inhibitory sculpturing of transcerebellar excitation, continuously (by switching or proper computation) or discontimuously. It is just imaginable that the complex structure of the cerebellum could serve a highly gradual substitution of various higher for lower controls for sensory & motor systems in behavioral development, a safe supersession. This control of excitation/& of inhibition is particularly notable given the normal & phylogenetic cerebellar-reticular cooperations (also note the importance of cerebellar-reticular comapping ie of specific-general af/efferents). It is possible that some/many of these &/or others render the problem/structure 'sufficient'. Of course it is important to the dis/similarities of physiologic/anatomic details that they be incorporated or dismissed.

Eg the increase in cerebellocortic afferents could have met the increase of gramule cells, or the increased furcation & terminal arborization & synaptification by afferents, could have met the elongation of parallel fibers could have met the increased size of Purkinje dendrcarbors could have met the increased number of inhibitory cells & types could have met the increased processualization of these cells could have met the increase in Purkinje collaterals could have met the increased Purkinje arborization of nuclei could have met the increased flux of pulses into the cerebellum could have met the increased cytoplasmic flows could have met the increased expression of the cerebellum—without bringing changes in cerebellar theory.

1973 Sept. 20

Dr. Nauta,

What we might look for is the increase of looping with the cortex generally. I suggested that this is what we have with the Papez circuit where the mammillary is thrown more specifically to the ascending route. Another example would be the enlarging parvicellullar ruber whose discharge is mainly to the thalamus (unlike the descending magnocellular ruber). Even if in this latter case we must include the cerebellum this constitutes a potential plus since good arguments can be made for the cerebrocortic enlooping of the cerebellum, too. We then might look for two or more broad trends: 1. the relative and absolute incorporation in loops involving the cerebrocortex, 2. the possible retrenchment or depotentiation of descending systems from and really proper to subcortic nuclei (for the favor of discharge back to the cortex and transcendentally direct descending fibers from the cortex (perhaps the abolition of a subcortic hierarchy whose levels are only indirectly reached by the cortex in favor of direct corticofugals at all levels)).

Does this appeal to you?

Pat

Pat Gunkel

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With regard to the special incorporation of the cerebellum into a circuit phylogenetically emphasized, it may be suggested that the cerebellum has served as the lower analogue of [redacted] serving the highly regular and highly topic interfacing or control of the brainstem generally. It can be imagined that it is the means for control over and by the reticular formation in the latter's many relationships to relatively differentiated nuclei. The cerebellum not only has, through its circuitry, highly regular function, it has tremendous (structural and functional) specificity of place and planar place, not only through the specificity of its interconnexions, and the brevity of intraconnexions, but through the overriding influence of serial and parallel inhibitions; we are not only dealing with specificity but also with uniformity which could theoretically be of great value if imposed modulatorily upon the various centers of the stem or the fascicular transmissions via the stem. Moreover, this peculiarity of loci in the cerebellum might have even greater signifigance owing to polyfunctional convergence at these loci and the widely assumed switching functions of the cerebellum, thus the phylogenetic direction might be towards the seperability or higher (and spatiotemporally regular) integration of the functions of the many interrelated nuclei, this entire operation being overseen by the cerebral cortex.

DOES THE CEREBELLUM CREATE QUASISTATIONARY (EG SPATIAL) STATES?

Pat Gunkel

Edgar Garcia-Rill and Bernardo Dubrovsky, in an article in the 29 Je 1973 Brain Research titled "Topographic Organization of Visual Input to Precruciate Cortex of Cat", find that visual, dentate, vestibular, and interhemispheric connexions go mainly to the axial and proximal rather than distal muscular division of the motorsensory cortex and theorize that the reason is that the axioproximal body is invested with a system of spatial coordinates or fixed reference axis to which the mobile distal parts of the body refer.

May the cerebellar input, above, (even the cerebellum) serve to fix coordinates between different parts of the body and between they and the world, say by semi-inhibitorily holding on to such coordinates (eg the climbing fibers of the cerebellum might serve continued sampling of the fixed coordinates held by the mossy fibers, independently, and this (independent inhibition and excitation in quasistationary states) could be the cerebellum's function; any such 'chunking' of 'behavior' obviously could serve learning)?

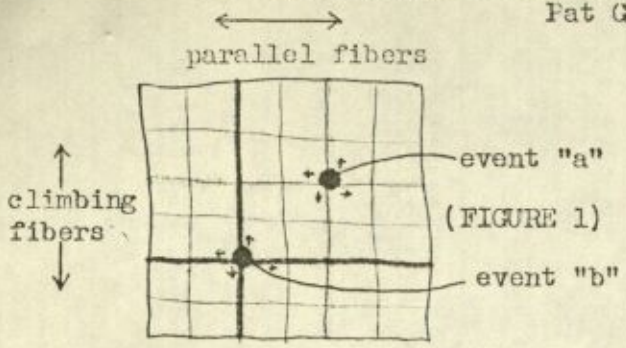
There is a whole realm of possible quasistationary states between different tissues that come to mind and could be exploited ontogenically and phylogenically, via the cerebellum itself or systems (now suggested) analogous in other tissues (eg cerebrocortex-basalganglia or cerebrocortex-thalamic association nuclei).

It is always interesting the extent to which one can confine a structure's function to a unique hypothesis.

After writing this I encounter the following passage in I. S. Beritashvili (J. S. Beritoff)'s book, Vetebrate Memory: Characteristics and Origin, page 58, "Following removal of the posterior lobe of the cerebellum (the nodulofloccculus and the uvula) and also the most anterior lobe (lingula), the functional activity of the cerebral cortex in relation to the projection of the objects perceived in external space, the establishment of spatial relations among these objects, and the production of orienting behavior toward them, is disturbed for a long time." The key to the transience may lie in the lateness in life of the experiment, long after control over the task-phenomena has sufficiently generalized to the rest of the brain, whereas congenital lesion or lesion at a certain intermediate period may leave these abilities far less recoverable and much more attributable to the cerebellum.

YET ANOTHER THEORY OF THE CEREBELLUM'S FUNCTION

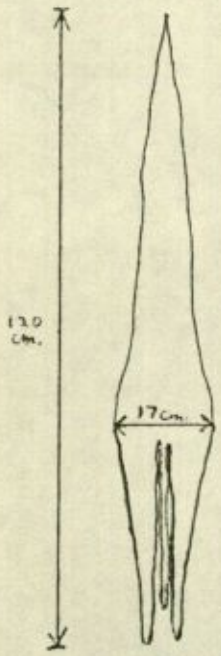
Pat Gunkel



(FIGURE 1)

It will be understood that although I generate many theories of cerebellar function each one is just as definitive! In an article in Experimental Brain Research 18, 40-58 (1973), titled "The Spatial Organization of Climbing Fibre Branching in the Cat Cerebellum", D. M. Armstrong, R. J. Harvey, and Renee F. Schild find that climbing fibers often branch and in doing so distribute to so-called parasagittal planes orthogonal to the longitudinal folia and hence the mossy-parallel fibers of the cerebellocortex. Branching aside, parasagittal strips are known to be physiologically homogeneous and similarly projected by afferent tracts. The idea leaps at us that therefore the cerebellocortex serves precise spatial and temporal coordination. It will be seen in Fig. 1 that the impact of two events (say on the body surface, say of the cerebellocortic figurines, &r on some teloceptive space) may be taken as 2 orthogonal rays (via the orthogonal parallel vs climbing fiber distributions) per event effecting 2 intersections if the events are simultaneous or concurrent.

The applications of this can be extremely various. Due to the contortions of the body surface and the random orientations of sensory spaces (and their contents) inter se there is a job of dynamic intermapping to be done assignable to the above structurofunctional scheme.



(FIGURE 2)

It will be seen from Fig. 2 that the unfolded human cerebellocortex is much longer in the axis transverse to the parallel fibers. Thus the apparent asymmetry in the comparative lengths of the distributions of the parallel v climbing fibers is not so disturbing as it might be. There still remains the question about the circular, punctal, or asymmetric distribution of the mossy fibers, per se. Moreover, the cerebella of lower forms are often mifoliate; of course there may be compensating factors.

To understand the initial idea a little better, note that the configuration created in Fig. 1 by the events "a" and "b" is a hollow one so that all imprecise and irrelevant loci are economically bypassed in favor of the functional intersects, intersects that are to some degree distance-indifferent and instantaneous.

CONCEPTION

Section III: "Conception"

How the Brain May Work

A simple explanation of the brain may be as follows: we have a large field of very active neurons. These neurons have an ability or tendency to get synchronized. Their natural tendency, isolated, may be quite the opposite, may be toward randomization & anarchy. Under sensory input, since the input is exterogenic & the world is naturally peculiar, the natural tendency may be toward the cumulation of most probable patterns or information; these patterns may tend to interact & so produce most probable patterns. This is introductory.

Initially the brain (receiving a very large horizontal input (it would be interesting to work it out in serial)) may synchronize around simple & undifferentiated patterns; these patterns are defined by the probability of the whole coming into one state. Less probable but more differentiated patterns will evolve as less probable eigenvalues (it is conceivable but unnecessary that this holistic pattern has some crosscortic mapping; this might correspond to the motor & sensory poles & their modality representatives & parts of the brain concerned with emotions or 'instinctive' responses (the patterns would obviously be conditioned by the cell content; macromolecular memory could simply be the 'far end' of the probabilistic states or oscillations; or changes in cell contents, regulated by electric activities & electrogeneses, could slowly adapt the brain to revive, 'rotate' & expand sets of memories or new holistic probabilities)). A special allocation of mental energies to 'solving' complex tasks within probable states is easy to see.

It is a continuous sequence of the neurons whereby they break into differentiated less probable states that thereby creates the differentiation of memory, mind & behavior. There is no reason to think that electric activity, & particular synchronies, don't migrate over the brain or have various 'gradients' (eg verticocortic, primary→hypercomplex→association, association→temporal-hippocampal memory, &c), but the important distinction remains that of the abstract pulsatory synchronies of the myrioneuronal fields (that may have peculiar motion or 'lives') that correspond to the probabilities of various memories (it is not unlikely that the electric activity that is not random is transient & epiphenomenal, & that the total pulsatory routines are intracellular; the syncytic probabilities could arise by a similar most probable differentiative continuous activity).

As to the primary sensory development (eg ocular) it could arise by a process of 'ingressive approximation' over cell oscillations disrandomized by gross sensory experiential differences. It is not hard to see, by the way, how serial specialization would show intralayer synchronization & probabilistic preference & differentiation, nor how this would combine with interlayer & total (eg segmental) activity as described earlier.

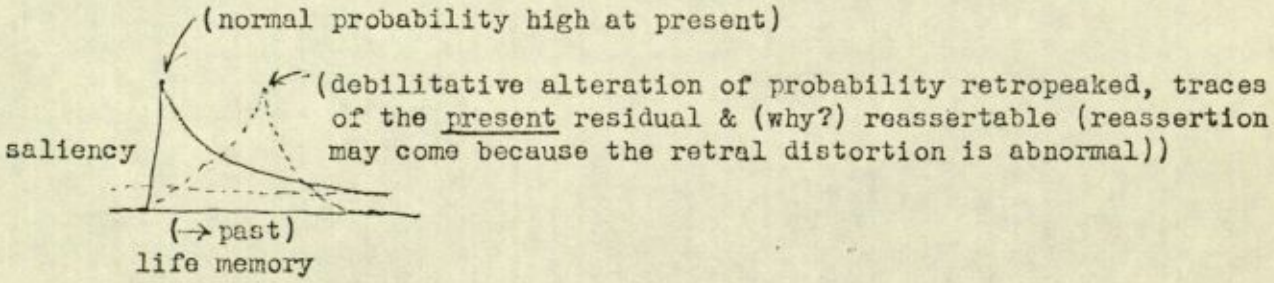
The elementary circuitry of the brain--ie the heteroneuronal complexes with their geometry, conductions, strengths, interconnections (mappings), inhibitory-excitory specializations, distributions, cell contents, synaptochemistries, industrial capacities, &c--might only or mainly or importantly serve in tuning the synchronies that are the differentiative & increasingly recognizable response states (subjective, objective, r inapparent), the states ensuant from the concatenation of various patterns (the 'old memories' in this system could be the originally most probable responses that are successively submerged, but may resurge in old-age; being simpler they could submerge & reemerge).

—cont.

Researchers looking for greater neural complexity--membranous, organellic, ~~ribonucleic, acidic or~~ proteinic, with the cell or dendrite count, &c--may simply be looking for 'grey' bases for accomodating, storing & modifying probable cortic states; it is possible that probabilities tend to maintain themselves over the ~10⁴ intracellular macromolecular turnovers, say macromolecular counts or even qualitative stores, & over synaptic states (which may be electricly silenced without loss of all chemical & probabilistic differentiation). Inasmuch as the probability of synchronies must be mixed & integral for momentary states & must be regressive (with differentiation & changing electric epiphenomena) this could be a simple explanatory basis for 'prochronomorphic' memory (to electricly trigger temporal lobe replays might merely be to depress--or distort--the probability stack, the same for retrograde amnesia or even dreams).

It should be noted that neurons should have a tendency to fall in various states r themes, these being (fortunately) interrupted & extended by whatever new experiences. It should be noted that the gross patterns of the brain will result from the synchronies of the differentiated unlike singular elements (which are scattered, representing the afferent field & only then coming together) & the disturbances.

The gross electric activity may seem quite irrelevant, by the way, the periodic & cumulative synaptic deposits & states between regnant. (Senescence may be synaptic—eg ~~ami~~mic--, transmissive & reproductive). Retrograde amnesia & senescence may be explained by this figure:



Postscript: The demonstrated character of the brain makes it seem likely that it works on a very simple basis. That basis has hitherto remained in darkest obscurity. The approach which is given here is adaptable to a number of alternatives. They should be clarified & presented.

CONCINNITY, SPONTANEITY, & CIRCULATION IN THE ORIGIN OF MAN

Pat Gunkel

The primacy of the mind of man may have many bases—some first, some consequent, some parallel—but it is likely that knowledge of the brain of various animals already enables indication of changes and bases sufficient. Pairing of items in "Order in Experience" is sufficient to hint the basis of intellect through a natural process of the continuous discovery of interrelationships. In this present paper I settle on a few things indeed suggestive.

The parietal small locus of calculia coextensive with the finger representation on the cerebrocortex and the dependency of arithmetic defect upon coextensive lesion is not hard to understand when thought is given to the form and size of representation of the hand vis the rest of the homunculus. Imagine an anthropomorphic but mad balloon with this very large representation of the fingers as a cluster of so many extrusions: it is easy to see how, especially in the context of how fingers (in whole, their tips, flexures, and so forth) are applied in tactility, what corresponds to calculation would readily gravitate to and originate in this digital zone or anomaly. It is generally suggestive how the spatial, functional, and bodily topologies would clash and be complex so that a conflictual and nuclear algebra would automatically arise in this case such that, e.g., receptive fields of units would exhibit in a bridge- or stringwork this complex and functionally complex organization. Similar economies, serving ideation by their structure and timing, apply to all kinds of similar facts.

The nature of textural perception in touch, as in vision, suggests some basis for a sort of counting, especially when the like of fovea and finger tip combine with their central emphases and other individuations.

I am concerned with demonstration and semiosis as in the evolution and culturalization of signal communication in, sensu lato, dance and facial expression. I am convinced that the parallel existence of possibilities for movement or position would lead to the differentiation of a homogeneous and rather universal nonverbal embodiment and conveyance of internal states and ideas, and especially some order of abstraction in conception (regardless of interpersonal communication).

It is notable that the frontal and variously motor cortex has expanded so uniquely and greatly in man, as other systems directly serving it, and there is the hint that the production of all kinds of action should have taken on a kind of inner purpose, experienced a great differentiation in the height of the cortices, and had some independence of the posterior variously sensory cortex. This could have led to the indefinite and greater elaboration of all kinds of actions, but in particular, as it happens, what actions might serve some cognition and communication or the conceptual development of motivation. Thus at this point I introduce faciovocal operations as signifigant in their human salience.

A particular type of synesthetic concinnity I have in mind is the stressed union or interaction of sounds, touches, sights, and acts in the like of Wernicke's area. It should be noted that the highness of these synesthesias in a remote cortex dispenses with the distraction of immediacy in the primary areas and generally, within the diffuseness and stretch in time and complexity, opens the way indeed for the synthesis of all sorts of really higher combinations of impression and their definition through some experience. So I imagine that the fascination of

simply the structure of letters and words makes onomatopoeia universal, bottomless, and of much greater importance than usually assigned. This holds equally—and notice how—for mania, philia, pleasure, abstraction, culture, and generalization of such associations or figures. But notice in particular the wonderful generalization that proceeds for instance from the grouping and forceful superimposition or intraposition of possibly related sonic and tactile stimuli and monosensory concepts, so that a unified texture appears between such things as surfaces of rocks and fabrics of sounds and larger events of these two. Now much as "bridging" should inevitably occur between the fingers, I would anticipate algebraic properties and transformations to emerge in a sensorimotor sphere and then, more important still, in all spheres whatever or those which we perhaps unreasonably delimit as "abstract", special, and human; that is, at least in the algebraic sense the world is a simple and thus simply generalizable continuum with the ontogeny and relative attainment of intellect as a graduation on this continuum, a continuum only naturally, as I have said, extending through time relations and parting with any so-called concretes.

There remains to describe vividly the abundance and natural differentiation of the degree of the process of motor extrusion of man in the world, wherein which extrusion and constancy the detailed elaboration of types of active organization of experience bring intellect by the agency of a simple continuum between elementary actions and highest actions. En passant, man may be distinquished by the degree and purity (by which is intended the isolation, self-concern, &c of so-called thoughts, the nontermination and exogenous construction of these thoughts or inobvious actions in man as opposed to animal, and, in isolation and independent expression, the chance for these actions to be apparent in all other actions (as in parallel cellular processes with special latency or in the coaction, mergence, and sui generis aloofness of these process or the remaining process or cell fidelities in the realization of the originally simple actions), and therefore to be in constant exercise and recorrelation (despite specific and excellent action) and therefore, but in general, for specific systemization of these actions to occur, or, in a sense or a way, for this to result in the deposition of so-called divided elements or mathematical-like functions) of reverbatory continuation or such time relations, of his internal thoughts (as the process of association and especially the value of thought are timeless, or rather, macrotemporal). If so, one might expect adaptations of parts of the brain, such that equilibria of activations, drives, modi, &c are more tied to internal processes of the brain of great complexity. (Note that the peculiar subtlety and diffusion of cell activities in association areas, proportionately to their height, issues a flattening that, if authoritative in such arousal, &c, must automatically redefine, spread, &c the timetable of cortic activation and the morphology of thought and character). It is to be expected that these and other peculiarities of higher and anterior cortices in man (such as the restful opportunity for such multiareal nondistraction, continuity, self-importance, and redirection, inter alia, of association, to bring into play and prominence not only a coexistence, but a simultaneous and unbounded multiplicity of both what, in the posterior cortic sense, might be called static elements for association, and of (motivationally and motorally) dynamic elements in such legion and continuum that possibilities would indeed seem unitary and change, or at least motion, false, in a dispersion covering all time relations, actions, and sensa of arbitrary complexity or simplicity, and interaction and arbitrarily subtle redifferentiation of categories or perceptions. (Obiter, excessive conductance between frontal and temporal cortices could result in a peculiar simplification wherein the complex ideas and actions learnt or developed already or occasionally in life and embodied differentially over and up this topography could be collapsed in chaotic mixture (or, perhaps similarly, just excessive prefrontal electric activity could involve such polysynaptic and complex neuropile) that there would be a basis for schizophrenia)...

One can imagine that in the new and expanded frontal (or other) cortices the brain may have realized the opportunity for in effect doing many things at once, for 'doing' things diffusely, for doing enormous numbers of things, for doing these for abnormally long periods of time, for doing things mentally but not motorally, and for in effect multiplying the number of minds in one head and dividing and multiplying 'points of view'. In the comparable posterior cortices the subject matter need only dominantly sensory things. I can imagine a brain 'flying back and forth' between memories and muttering "I can do this, but if I do, this may happen, which would occur this way, which would have such-and-such consequent action," for an enormous number of things across time. Furthermore, there is enough complexity to the way things are and happen in the world that any of the events experienced in something like their entirety and thus memorized, would serve as 'internal tests' and challenges to complexity of explanation to the self-concerned brain as portrayed above; one oversimplifies and imagines a decision tree at each of the branch points of which "Why?" would be written in bold letters, e.g. "When I did this before, x problems evolved in y ways; in fact, more or less this occurs every time I do 'it'." The problem of motivation is suggested by the fact that such diffuse and sharp analogies would leave irritant and pleasurable markers as in some dissatisfaction with one's completed response to a situation or process of thought; this could occur simply if there were a certain balance of forces for motivation in the cortex and higher cortices vis the lower brain and its cell fidelities, power over behavior and experience, &c.

In any event, I can now imagine these internal and esoteric processes carrying attention, behavior, the individual over into some active pose in the environment or in self-interaction so that phylogeny would go in the direction of an increasingly experimental being and a being increasingly controlling the environment in one sense: man has to interfere, recreate, personalize, seek power, and vent attitudes or memories. The result would be the same conceptual heightening that one sees sensorily, but in this case the hierarchy of occasions would be purposive and "egoic"; the ego is in a way the measure of the "motor dominance". But it is noteworthy that at a certain intellectual plane even the motor acts would crystallize as effects or abstract ideas and lead Platonistically to various degrees of satisfaction in the performances of others and cooperations, the community and altruism arising out of or along with this; therefore new stases would form, closure would occur in the world, and in this very circumscription intellect might have a chance to rise to very high planes as part of a natural process.

There undoubtedly must be an interpenetration, interaction, and conformation of the very highest or most diffuse possibilities endogenous to the highest cortices and the relatively primitive but highly ordered cellular relationships emphatic in lower sensory and motor cortices, arranged in a continuum, so that for example segmental experiences and actions would pair with sensory clusterings in the equipment of the mind with abstract calculation or some 'number' or quantitative sense, some excavation of groups at all stages of mind.

Infantile babbling and "random motion" involves a musculature whose total operation and balances or 'eases' is idiomorphically specific and encourages schedules and patterns of operation. Also the external world is this way. The production of these kineses in the child (whatever the basis of activation and the 'wiring') must automatically lead to the development of cell fidelities, schedules, and strengths in the brain patterned in the subsequent life of this musculature, but goes on while the child is sensing the world in its peculiarity. Moreover, two things: the muscular innervation and its neural masses are prewired so that the innate modi of the nervous system are represented or exert themselves,

and the universality or order in the world, within the various classes of order, automatically provides commonalities and thus a lanquage between the schedule of parts of the musculature inter se and with, in a sense, the total sensory influx with its regular importations of order, so that arbitrarily and essentially the correlation of these two neural differentiations confers an expressive or representational evolution upon the vocalizations and performances, with the result that the vocalizations encode experience and have the opportunity for phatic and elementary and tralititious communication, and convergence is induced in the general cortic associations (the convergence is transtemporal and 'thus' general). Recall that the concinnity of tactile and sonic textures is ideal and thus directive (e.g. ideal because final and indifferent), and great; so equally the motor productions would have the opportunity for finding textural pairings of this really subtle order. The nature of neuronal dispersions very likely means that e.g. the difference in size between two forms will be represented say by common interneuronal patterns and loci but quantitative differences, and there are other possibilities; the consequence of these in all the cases will be all events (be they motor, sonic, visual, or what) have orders of similarity, probably in a "dimensionless continuum" (which is a bistate situation where all things are represented twice in a point and a continuum). It is worth considering that the dispersions on all continua will be so great that the learning of any event and, surprisingly, the emergence of any concept may occur by picking out and putting together some (finite or stressed) set of the continual points; coupled with habituation, and its "diagonal" drive into generalization (diagonal because inescapable), the phylogeny and ontogeny of most general or 'best' operations may be mechanically simple, i.e., higher mind will emerge naturally.

Letters and words involve visual, tactile, and phonetic structures; the representation of these structures in the brain will be by points (pulse interactions); the nature of neural representation is that it involves random continua so that homogeneity and specificity are represented in extremely heterogeneous and complex forms so that it involves redundancies and synchronies; the nature of these continua means that all the order sets (somewhat analogic) will be resolved so that an "emphatic dimension" will emerge distinctly and a 'multicentric' analysis (or "congruocentric") will occur, the order sets may be taken as the neural transformation or the pure convolution, or the intervals or comparative heights in the single emphatic dimension; a probability-frequency analysis will then occur (at some rate) within the confluence of random continua or the lone random continuum of association (which is the difference from other systems of probability); such randomly dispersed condivergent representations enable specific but complex pairings, an aristocracy or chrestomathy, to be 'found' between all sensa, with a measure of universality and communicability, so that e.g. vocalizations may communicate ideas. It is possible that the random dispersion of the order in experience and the evolution of order in the brain is a peculiar probabilistic progression or rerepresentation so that intercellular transactions possess extreme mental continuity because with each transformation the (impressed) concern of the cells will be with what is most probable (the information may be flattened down and dispersed into all the degrees of freedom and 'history' of the system (the specificity in a history may be just enormous in a large population; 'macroscopic' changes or injuries will not but negligibly (microscopically) impinge on the otherwise total informational load impressed in unbelievably esoteric cycles of the tissue; this is relevant both at 'particle' and 'cell' levels; the specificity of the external world may be in this way already historically great (moreover, it is conceivable there are 'many histories' in any system such that these may be 'cross-imaged' or selected instantaneously!))); these ideas pertaining to memory.

it is notable the extent to which so many--eg glandular--processes are rather removed from conscious control; suggesting how important may be proper, relative, and serial arrangement of functional areas.

Conceivably the function of reticula, inner-cores, hippocampus, and other ictal-like structures is to produce occasional flux, association, computation, &c through random continua; modification, generalization, retirement, assertion, intrusion, and certain intersystemic correlations. In man for the first time (through subtlety, complexity, or whatever) a brain may have been formed able to both survive and act immediately, and to go on thinking, reacting, and integrating labile random continua.

Various circulations may mark the human brain. Audiokinesthetic association, &c through the superior longitudinal "arcuate" fasciculus. Thymomotor association through the inferior thalamic peduncle, uncinate fasciculus, Papez circuitry, Pandya circuitry, pulvino-anterotemporal bundle, supplementary sensory and motor areas, cortico-brainstem fibers, &c. Corticosubcorticocortic flows (pulvinar glomeruli or associations are especially interesting because their anatomic vergences, in relation to association area enlargement, suggest an exponential gain in intellectual power by enabling such simultaneous pluralism, pantarchy, and noninterference, and powerful synecdochic transformational series, and, a fortiori, such rapidity and complexity of synecdochic reversion of extremes). General and long corticocortic associations have increased, or increasingly and more sharply stepped. And the like. It is as yet unknown what are the relative importances of strictly intraregional, interregional, intraneural, intrabodily, extrabodily, and 'whole column' ladderlike ferent loops. Hypothetically a sensorimotor loop circumscribed and labilely tied to considerable or equilibrial arousal could be decisive in man's intelligence, and a specific ontogeny thereof could be decisive as well.

In any event, I can picture an extraordinary accenting of a productive-sensory system in man resulting in an extreme spontaneity and thereby birthing a mind that emphatically intercorrelated all or some senses, muscles, glands, and centers among themselves and together (or better, stressed certain loops, e.g. vocal), so that e.g. sounds would come to stand for things or things for things so that condivergence would produce repeated heterogenization and homogenization or a generalization into where tendencies to act (as in phonemes) would be harvested according to some golden mean of their economy and reduction, and stand for things in terms of intrapersonal and interpersonal self-consistencies; I can imagine a forced situation where things grossly dissimilar (e.g. different senses) might be associated in terms of having <u>any</u> combinations. Incidentally, it might be a different situation if the 'spectra' of the various correlations were for once in evolution made to have (some degree of) specific-specific rather fixed relation (e.g. pitches with certain muscles); the effect of this might be, e.g. followed by higher cortices, that a lower-analytic language would be interposed into the analytic or referential process, by this introduction of some arbitrariness.

NOTES FOR PAGE FOUR:

<u>1</u> "Forcement" of expression and correlative antagonism?

<u>2</u> It may be that all random-continual possibilities are flattened or "plenomorphic" and such "equal", and that <u>any</u> organization or choice of forms can then occur arbitrarily as a shaping but as an <u>active</u> process, eg based on 'sculpturing' via reticular reinforcement, hippocampal successes, or the like; the entire formation of character (and virtually perception) would then be a shaping or "evocation".

<u>3</u> All points on and between continua adjacent.

<u>4</u> It might be interesting to consider prophylogenetic helps and forces of diagonal generalization.

NEUROHOLOGRAPHY

Pat Gunkel

I am now convinced the holographic idea of the brain is valid, that forms hitting area 17 and dispersing over 18 and so forth would leave enough pattern in this tissue that the following could work. The visual field is continually filled with vast numbers of objects. Intraconnexions in 18 between local cells and all across the tissue are sufficient that pulses could be thrown back and forth across the extent of the tissue in the time it takes evoked potentials or recognition to occur. All objects are so similar, there is such relatedness in total visual detail, that all objects falling anywhere and regardless of size, rotation, distortion, &c would contribute to there arising in random continua the transpositional equivalent of the forms man perceives with such ease. The amount of cortic autoconnexion may or may not dwarf specific afference. The interrelated detail of afferent forms will spread within the tissue with specific time relations for its structure and detail and this movement will preserve the universality. The task of the tissue will be to bring the new impression into sufficient approximation with its patterns or criteria. The problem for phylogeny may well have been how to exclude excess correlations and overactivities of the tissue and the problem for the brain may be how to isolate a correspondence from association with all its memories or how to dissociate the clathration of all these memories from a smaller and therefore more specific mentality and efference. It is conceivable that emphasis is here returned to psychogeny and the mechanisms of the subcortic part of the brain. Note in passing that the difference of man may lie in mechanisms fueling the independence and persistence of parts of the brain, such as association areas, other than primary cortices serving merely the rapid identification of sensory impressions and report to the former; changes may have been introduced eliminating the organization of the nervous system for automatic responses.

It is worthy of note that the interferential scheme above needn't produce a forfeiture of detail; any forfeiture of detail in ontogeny may relate to the brain's willful or justified economization of analysis, or there may develop a concentration of attention on the internal possibilities of thought and a finickiness about the admission of observations disturbing introspection or even the mere execution of now-circumscribed behavior.

Questions arise as to what would be the organization of just the cerebrocortex serving best such a holographic mind because there are some possibilities that are suggestive. A tissue wherein triggered pulses reverberated least or most, stayed local or spread everywhere in the tissue and repeatedly, were confined in their different activities to different laminae, wherein the striae and U-fibers were above all interested in either farthest or most diverse distribution as opposed to some vicinal radiation, wherein the impressions were held not as reverberations or circulations so much as passively in the synapses or other materials of the cell, wherein the sustained irradiations of the relatively continuous and immobile inblowing objects could take advantage of this constancy for autocorrelation, wherein the stress might be on either autocorrelation or intercorrelation of objects, at once or diachronically, &c. None of these ideas are compulsory or compelling but some are attractive. The marriage will wait.

SOME FURTHER PRINCIPLES FOR THESE SCHEMES

Pat Gunkel

Regardless of which of some schemes the brain may employ in cognition, a number of hypothetical principles and methods may be introduced enabling, helping, and supplementing these schemes. Should they do so in fact, the degree in which they do so is a matter of seperate interest, as is also to some extent the particular way. There is ever the worry that the brain possesses covert inheritance explaining its operations, but in this case possibly these hypothetical principles and methods occur by the convenient fact of such inheritance.

Nondisclosure refers to useful or essential role of nonsimultaneously or obscurely revealed components in selecting among neural possibilities and thereby capitalizing on complex predictive relations in the advance of recognition. Eg the tissue may specify a certain range of alternatives or ambiguity, even a just enormous range, and this range may then undergo adaptive selection by the verification and interaction of exogenous or endogenous consequences; note the important feature of a random, evenly distributed range. If the object to be recognized is a triangle and is originally mostly hidden, progressive disobscuration could enable a regressive retroactive and proactive refinement of the predictive patterns of the watchful tissue, eg in this way a generation of "signs" could occur with variable properties of universality and complication. Very specific if highly arbitrary signifigant correspondences could be set up, including equally elaborate but potent hierarchic orientations whose originally thin branchless stems would then transmogrify into vast crowns above canopy; a predictive web of mind would knit, in an organic growth, together. More important still, the inexistence of a limit to prediction and the molecular nature of the predictors would cause the incessant enlargement and extension of the predictions or the origination of generals from particulars. And the nature of this process would bring circumventions and transcendences of difficulties inherent in recognition, obviating criteria by pragmatism and salient retrospection. Various Darwinian principles may operate successfully in nervous systems.

GRAMMATIC AND SEMANTIC PROBLEMS AND THEIR SPECIAL SOLUTION

Pat Gunkel

For a long time the computer people have had a hard time trying to mechanize language and one might even have supposed that that was impractical. The reason for and the solution to these chaps' difficulties may be stated this way. In addition to the operations of grammar there is a component of experiential meaning in discourse inapparent in the grammar. Purely formal operations of grammar are ambiguous. There are the mnemic materials of existence and logical implications for all purposes wholly missed in mere grammar. Intrinsically and extrinsically, implicative possibilities proliferate in sentences and, certainly, in series of sentences, going on to books and the whole of experience. Accordingly these things govern the choice of words. It is not as if unidimensional lists described subsenses of single words or told much at all about those words, as only in combination may some level of nontriviality or relative importance come about and be embodied in the grammar. It is, on the one hand, of course obvious that progression from the natural start of a passage or whole gives predefinition of concepts and words that are then handled somewhat more freely or peculiarly in the subsequent arrangement, and that, without start or certain ordinality, the directionless clustering or even incidence and coincidence of words supplies definition and terms of reference for the discourse, and on the other, that forms in the external or experiential world themselves are organized in similar ways and degrees so that a coupling with pure discourse is necessary for sensibility. It is notable that some definition of words and forms sets a lanquage that is then absolutely or procedurally organized or defined in the course of use, in the initial generation of a language, and in the course of experience. The ontogeny and 'phylogeny' of a lanquage establishes nonarbitrary probabilities within a style of language and thought that would otherwise be indefinite and unable to specify meanings. This must be learnt but is clearly without the province of a machine that at any one time is concerned with a few passages or is in any case concerned with those passages in the absence of any experience of the external referents of that language which own their own definitions. It is this which distinquishes similarities and combines dissimilarities in the course of writing, reading, and outward thought. There is no specificity in any word-form and, even beyond grammar, the very operations of the external world are ambiguous in their everyday combination. Therefore "connotation" is a very weak allusion to this difficulty, and any lanquage translator along the lines that we now have is apt to have a very cumbersome output and one everywhere filled with ambiguities that are quite often nonsensical. Among the questions asking to be asked is whether some better operations might be given to these computers to lessen the difficulties of their output, but perhaps the answer is that not without some approximation of the machines' experience with our own, which is, the genesis of lanquage in the day to day world of concrete activities of concrete objects as opposed to something farther toward the pole of sterility. In this connexion, one could imagine a hierarchization so that a machine could have rapid access to many universes of referential discourse, as perhaps occurs in the brain.

It is important to point out that there is nothing special about operations in time as opposed to operations in space, except that activities may change in time and thus confer an added dimension of complexity, which however is to some degree foreshadowed in familiar operations in space, and there is no dichotomy. Therefore at least the fact of temporal properties of linquistic as well as cognitive operations should occasion no added concern, and the development of very complex or characteristic linquistic operations faces the theoretician in a simple way. Other than this, the parts of grammar may be taken as simple organizers of operations, the total linguistic-cognitive operation being the product of pragmatic experience imaging that experience pragmaticly.

There is a complete word-frequency computer compilation of English usage. It might be of value to take this and study the ranking. Eg the first words may be those used so often that or because their intercorrelative structure gives the structure of lanquage, thought, &c; that is, they may have the intensive effect of biassing language in a certain direction or serving as the crude-sensory or textural material for the rest of language. It is of course not immediately obvious how 'flat' will be the ranking and importance of these words, such as the 'slope' by which the commonest words occur or condition the less common.

Likewise it is of value to take random, common, or particular words, such as the word "work", and 'overdefine it', that is pursue the phantom of its ultimate or essential definition. Defining these words in any case may tell a great deal about the structure of thought, experience, perception, and production. Taking work as the example, and overcoming the mere seperation into denotation and connotation, it may be seen that this is not just a synonym for an elementary description, as eg the concept of causality, degree, irreversibility, use, complexity, direction, &c is inherent in the term. Furthermore the word combines in extremely specific ways a pattern of things; this combination may serve to suggest the physical description, operations, and principle of all kinds of things, and furthermore may serve as the name or surrogate of these things. The minutiae of associations form a net that is 'pulled into a configuration', critically shaped, dynamized, vitalized, however you will, &c by this act of naming, use, and recognition; it is somewhat like the manipulation of a sail by a hand. Once a number of things are decided in this way they form a matrix that is quantitatively and qualitatively infinite in its implications, yet this implicative fabric becomes the structure of mind.

THE SUBTLER ANALYSIS OF INTELLIGENCE, EG IN THE WORK OF J. P. GUILFORD

Pat Gunkel

I hold steadfast to the notion that human intelligence is considerably universal in its abilities, and that, whereas trivial things may make a profound difference in the solubility of various tasks, basically our minds use universal mechanisms. I believe in a general human intelligence to the extent that in terms of potential and working, but not ideally equal, ability quantitative differences in intelligence are more important than specializations, in ranking men, different problems have much in common and more in common than not, and the problems represented on intelligence tests and in experience are not specialized in discrimination for certain abilities and in the important disregard of others; it may of course be that, divergently, men have used their general intelligence to develop specific aptitudes in specialties or have simply come by experience to be variously unequal in abilities, but I would consider this deceptive, less important, and not as true as some might think, say in the ability to later learn these specialties as well, where differences in this ability to learn could be disregarded as trivial deviations from an overriding convergence and generality of intelligence; I would plug for the existence of quite general operations, of at least potential quite general mental style, discipline, and care decisive in intelligence in combination with undoubtable neurological differences, both inborn and differentially elaborated; I would say it is easy to quasi demonstrate specializations in intelligence demeaning general and universal intellectual powers, by the constant exercise of trivial factors such as the tailoring of questions for the consistent exhibition of trivial specializations basically unexceptional to the rule of the generality of intelligence; I would say that specializations in temperament are far more likely to lead to differences in universal intellectual ability; and I would say that those in counterargument to my view are more than anything opponents of the irreversibility, improgressability, and completeness of mind in men, in which case I rather concur, and it must be admitted that in many cases I would hesitate in the relative degrees of emphasis I would put on the above points, or would even hesitate in the explanation of just why tests show and reality contains differences in universal intellectual ability and power. From the other side of the road, it fails to be so obvious what is the motivation and exact viewpoint of the polemical and recent detractors of the concept of general intelligence; it is obvious that those in machine intelligence are specially interested in making the point that the extension of particular aspects and schemes that are undoubtedly intelligent may lead to unsuspected resolvability of some and even general problems, which is true, but need not be in conflict with the idea of the generality of human intelligence and the special importance of any such generality in the solution of the problems of the world by machines that do not just mimic and caricature the talents of human beings; it is true that other versions of how the brain works (at least when it has not become misspecialized) are far more compatible with ideas of the generality and universality of mental operation, abilities, and power and are thus a thorn to the war-weary in such fields as artificial intelligence specialized in terms of notions of the segmentability and restriction of parts of the world, behavior, brain, and computer due to their poor performance thusfar as contrary ideas.

In my previous article, "The Analysis of IQ Tests and the Nature of Intelligence", I confined myself to the tests of H. J. Eysenck, which are not crosscultural, not so good, and anyway suffer from the mistake (with such tests) of apparently being the work of one man, which creates redundancy

and the very specialization whose deploration we have just been discussing, for IQ tests often exactly deserve to be the product of a contribution of minds or otherwise that degree of specialization or at least vice which exists will lead to such tests being the expression of enigmas. The work of J. P. Guilford, as in his books "The Nature of Human Intelligence" and "The Analysis of Intelligence", on the definition and measurement of intelligence I find much more satisfying. He has applied factor-analysis to a quest for the largest proper diversity of aspects and abilities and their insurrender to some amorphous embodiment, to the depiction of the structure of that mind, and to some degree of the world, and to some degree of the intercompensation of those aspects and abilities. Of course it may be that a perfect intelligence test is an issue independent of the essential universality of intellectual functioning, and that even in the very best tests such as Guilford one is ill-advised to seek an answer to the question of intelligence being very specialized or very general. Appreciating the tests, however, one can busy oneself with the new and piecemeal analysis of intelligence in the quest for how the brain works.

A final point, I have noted a disappointing tendency of the critics and carpers aforementioned to forget about averages, eg just in the sense that their studies (to the degree they deserve the term) or reflections consider problems of a very few aspects or examples but neglect any average and massing, as well as counterdesign, of items for the production of natural averages and often the specific designation of intelligence. IQ tests work if people compete and believe in them, if they are well-designed, and if they are not already approached with an attitude that is confused (which happens so often today). They would work if they just measured choice with axiomatic narrowing and sufficiency in the criteria, eg.

Turning to the material.

Example 1. Two photographs of geometric blocks arranged in space are given in addition to three columns of two photographs of various arrangements of other blocks, the question being asked is one's judgment as to similar orientations; the answer is based on one's column having same change of position for all the elements (a 45° rotation of a similarity- and proximity-grouped "T"-formation), all eight photographs with oblique perspective. Of course one sees further that the given and answer columns differ from the false columns by greater simplicity and regularity of grouping, by better representation, greatest number of elements, and greater commonality of elements; why all these clues got in or what their function (much less measurement) is is not clear and, by the way, one finds the same biases in H. J. Eysenck. But as to what is evidently involved, there is an ability to recognize three-dimensional objects in a photograph that is not "ideal", to extrapolate planes in space (and/or perhaps to rely on some bias to greatest simplicity of planar diversity, to detect and add errors or to pursue errors), an ability and tendency to "rotate" the configuration in one's head (eg to understand the primacy and simplicity of horizontal rotation) and allow isotaxies to 'intersect' , &c. Of course, given the instructive restrictions in this case, the task is specially easy and one is not left with the itself-signifigant ambiguity of Eysenck's tests.

Example Two. "Underline the odd-man-out.

zeus	AZEETRIULOS	4/11
hermes	CHEELORUMAELUS	6/15
	NIVERINNIURIS	5/14 venus is odd (precedent vowels not
apollo	REALOPPOQSILILOQ"	5/15 part of names)

Comment. Requires: acquaintance with the pantheon, the names are incorporated unidirectionally and in one sense regularly, excessive recurrence of specifically coupled vowel might be noted and a scheme sought on this basis (eg which 'could only' go two ways), 'all' unidirectional names might be sorted out, the initial "Z" might serve as a restrictive trigger, Eysenck's aptitudes might be guessed in choosing words and schemes, lots of even consonant doubling for some reason occurs indicatively, perhaps this type of problem roughly has occurred before or was 'inevitable', the spacing averages out and even in the first two examples is partly the same, the doubling of the letters occurs in conjunction with the apt letters (cf apollo), the ratio of letters provided to word is always about the same (eg ((n-1)=3)+(1); or by n, as before, ±1), perhaps Eysenck has unconsciously settled on an 'internally obvious' set or a set that is probabilistically "indicative", one can do eliminations of subelements (eg in the sense of looking for clusterings), &c.

Example Three. "I was supposed to meet my girl friend at noon every Sunday. The first time she came at 12:30 ((-30')), the next time at 1:20 ((-(30+50))), then at 2:30 ((-(30+50+70))), then at 4:00 ((-(30+50+70+90))). When did she turn up the time after that ((-(30+50+70+90+110)=5:50))?" ("In everything or in a woman's way there is a pattern.") 0

-30
30
-50
80
-70
150
-90
240
330

Comment.
Simple recognition of additive progression or-and performance of regular subtraction or cross-comparison.

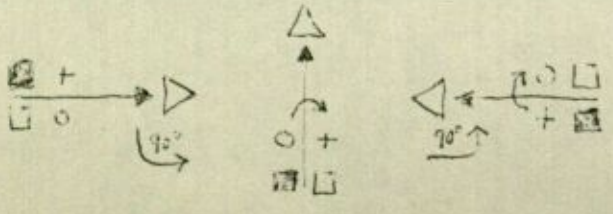
Example Four. "Underline the name which completes the fourth line.

i j k = 3 letters apart
Hero loves Leander
e f g h i = 5
Darby loves Joan
klmnopq = 7
Juliet loves Romeo
klmnopqrs = 9
Whom does Joan love - Tom, Dick, or Harry?"

Comment. Again it must be understood Eysenck is playing with letters in spatial and numeric series. Other possibilities of comparison and analysis must be excluded, or what is the coincidence of a 3-5-7 series in the naturally ranked set (itself excluded!) of possible analyses? Furthermore, the kinds of analyses used by Eysenck are typical and exclusive; if all other analyses are performed, what do they prove?

Note the redundancy in the questions, eg where series are extended to, having provided an example, give a progressive probability of or narrowing to that example.

Example Five. "Which of the six numbered figures is the next figure in the series? Underline the answer."



THE ANALYSIS OF IQ TESTS AND THE NATURE OF INTELLIGENCE

Pat Gunkel

The conclusion of such study is that problems that humans set themselves and then solve are not so dislike and that the styles of thinking are widely applicable to the world, that is, the problems of the world are not themselves so dislike. The world then becomes so many combinations of these solutions.

The problems are after all ones of familiarity and discipline in the use of these materials. In any problem situation there are what might be called certain "indicators" as to the nature of the situation. These indicators are combined in a certain way in situations and it is this same combination that the intelligent being draws on in solving the problems with which he is presented. It may be argued that the problems of IQ tests are not the problems of the real world, but this is too obviously an escape from a lifetime of learning of all the cues drawn on in problem solving. It may be that the flexibility that is required of a mind that it pass over a succession of problems and ultimately distinquish between and work within types of problems is itself not very great. It is therefore hard to think of any problems which are beyond the prowess of a straightforward serial machine. Evidently the intellectual limitations of human beings are themselves in need of examination as it may be that human intelligence is constrained in some arbitrary ways less worrisome for attempts to raise intelligent machines than was formerly thought. The question of the specificity of cognitions is inextricably tangled in the degree of memory used by human beings, and it may be that the variety and complexity of those cognitions in some important sense is not overly great, vis-a-vis the seperations and qualifications of problems by the agency of much memory of much experience. In perception and memory the operation of parallel processing may be the golden key that opens the door on whatever be the nature of cognition. It may be that serial operations are adequate in man to discriminate 'cognitive' answers, however it may be that parallel-processed integrals were necessary for the arrival at working serial operations. It is probably opportune to turn back to some work I did voiding the necessity of a dichotomy into strictly parallel versus strictly serial things.

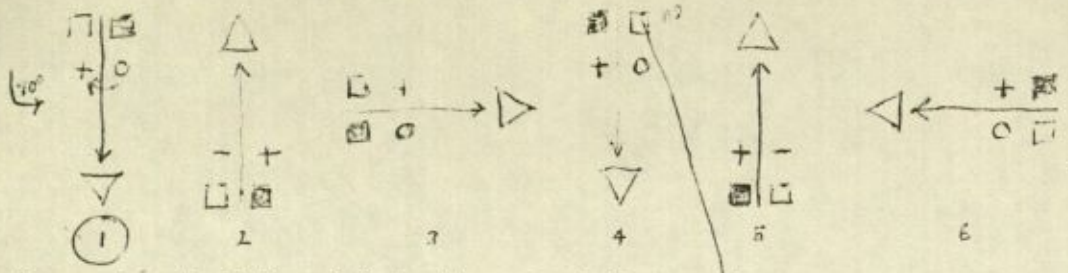
It is apparent that the categories of so-called "primary, secondary, and n-ary order" could well serve as the bases of a systematic study of the intelligence of human behavior.

Example One. "Insert the missing figures.

1	3	7	19	$\frac{115}{576}$"
1	2	4	24	
$\frac{1}{2}$	$(\frac{1}{2}+1)\div(1\cdot1)$	$(3/2+2)\div(1\cdot2)$	$(7/4+3)\div(1\cdot2\cdot3)$	$(19/24+4)\div(1\cdot2\cdot3\cdot4)$
	$3/2\div1$	$7/2\div2$	$19/4\div6$	$115/24\div24$
	$1\frac{1}{2}$	$7/4$	$19/24$	$115/576$
	$3/2$			
	1	2	3	4
	(natural progression--in a use (of possible sets of uses))			
	1^2	$1\cdot2$	$1\cdot2\cdot3$	$1\cdot2\cdot3\cdot4$
		(natural progression)		

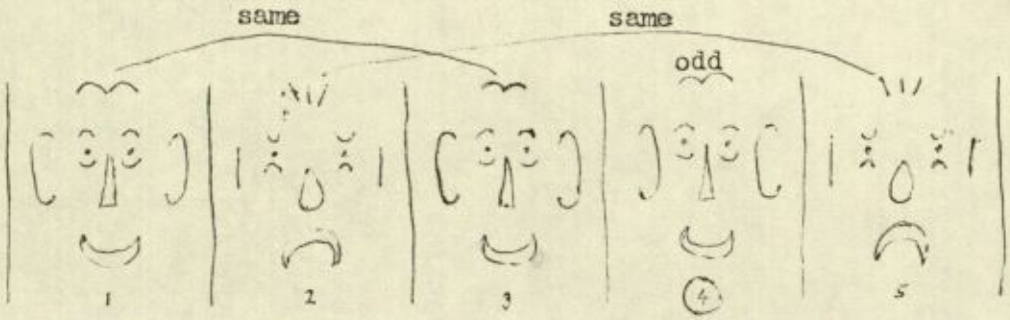
Comment. Playing addition off multiplication is a natural combination: in how many ways could they be combined (=could you solve this one very difficult problem?).

Solution of numeric problems, in general, would require various measure of acquaintance with, and skills in, mathematics and the use of numbers, for having worked with them their characters and sequences would have more and more parallel-operating analogues in the brain giving flexibility and identity, as well as the chance of 'insight' which is the considerable switching of alternatives for the sake of a new solution, or the elegant resolution of a complexity.



Comment. I: "o" and "+" alternate bilaterally.
II: Orthogonal anticlockwise regular progression.
III: Other elements stay the same.
Matrix and average out the possibilities. Note various more complex possibilities might have even better solutions but are excluded by initial criteria or simplicity.

Example Six. "Underline the odd-man-out."



Comment. One has to have the ability to rapidly classify the elements of the figures, to compare all aspects of the figures (eg in sets) and merely to discern the exception.

Example Seven. "Insert the letter which completes the series.

1 3 2
two T four U three H" thus always = one less than the number named

Example Eight. "Insert the missing letter."

R -4 V -6 K -8 Q -10 letters
N P C G

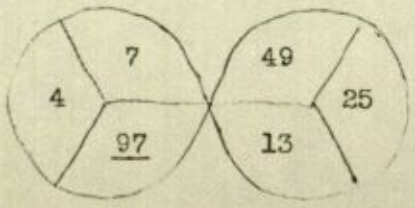
Comment. One has to realize the presence of numeric groups in these examples, and to be able to scale between the examples in various directions: note the value of 'mathematical' acquaintance, as in reciprocity.

Example Nine. "Underline which of these is not a boy's name."

TEBORR robert
TEENBICD benedict
LAWMILI william
SEVUN venus

Comment. One has to be able to unscramble names uniquely present in collections of letters. One way would be a recognition of the commonality of letters and letter sets of letters to certain names, &/or a decisional tree exclusive study and narrowing. Or one could form all combinations (5x5=25 and 8x8=64) and seek real examples, which could employ parallel processing or just a 'very' fast brain. One must recognize the nature of the problem, and that the provided are not final names. One must know which names are and aren't boys' and girls', and perhaps deduce that a girl's name would be the sought alternative or replacement.

Example Ten. "Insert the missing number."



Comment. One must be able to visualize the natural set of spatial patterns, patterns of number, their commonality and the simplicity of a solution. In general, one must be familiar with all the methods and styles apparent in such tests, eg the tests may test one's overall acquaintance &/or ability at mathematics.

Example Eleven. "Insert the word missing from the brackets.

worker (roam) amaze

tester (seem) omen"

Comment. One has to have the ability to rapidly explore word-letter combinations--in addition to semantic analysis--(flexibility) and choose closest alternatives.

Example Twelve. "Insert a word that means the same as the two words outside the brackets.

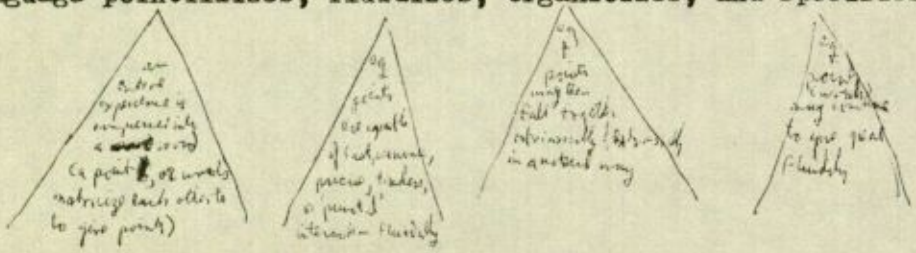
weapon (bow) tie"

Comment. One has to be able to ask oneself for long lists of synonyms and related words and to go over these in one's mind to find such a common word.

GENERAL REMARKS-1
Pat Gunkel

Just how important is language to human intelligence? More important yet, of course, may be the possibility that the primal use of language by man's ancestors resulted over time in specific, elaborate, and decisive conformations of the nervous architecture and the concomitant (itself causal; involving more purely lingual architecture or conversely a general adaptation of the brain resulting from language but for all expressions of intelligence or at least such as may if they exist be demonstrated in alingual, feral, "attic", and aperipheral men) elaboration of nonlingual intelligence, whatever and howevermuch that may be. Of greatest interest is the fact that language cannot be excluded as the origin and maintainer of the intelligence of the human species: it may be useless to other species and man's atypical brain may explain this, but this does not (nor does general information) tell us what limited intellectual capacity would belong to a man a. truly experientially alingual and b. free as well of any cultural contact such as might convey to that man the intelligence embodied in the verbal language and tralititious c. or in kinesic, symbolic, or technologic form in the cultural mis-en-scene.

Words and syntax have properties whose implications for thought in brain may be radical and unsuspected. One important feature is their absolute stability and another their systematic organization so that, presuming they are associated with thought and complex objects of experience, their drift and autospectral and crosspectral association may be regular, recursive, unlimited, and furthermore predictive so that important learning may actually occur, the former "background" of the brain may now become meaningful and important, and their slightest nuances and intensive implications may be productive because the brain will become totally organized, totally organizing, and totally self-extrapolating. Another important property is that sentences are ordered and reflexive so that reversals and introprogressions of thought are possible, easy, and even necessitated. The macrocosm is reduced to a microcosm because of the vocabulary, syntax, inflection (eg tense, mood, voice, aspect, number, person), &c of language. A similar progressive abstraction and incorporation is visible in etymology and diachronic literature. Language even incorporates the self and establishes it in society, in a structure of environment, in collinear change of the world, in expectations and purposes, &c: can it be wondered that language may bear thought? By the collection of words in vocabulary and by the intersentential systematics of life, the meaning of words becomes a specific modulation and organization over the words, and such organizational processes have gone on since language has been in use and in the specific organic holistic incorporation of the world and progression of the cognitive value of the latest state of the language and of the reflective and autonomous culture described above. Language pointillizes, fluidizes, organicizes, and specifies thought.



BEYOND 'SERIALISM VERSUS PARALLELISM'

Pat Gunkel

It is time to get beyond this dichotomy or these terms and not just for a compromise or reconciliation. For one thing one feels a constriction about one's head in the course of their use, and for another there is some question whether the pure concepts have any meaning or relevance to a noologist. Most important of all, I feel, is the constant experience that a noologist, such as a computer scientist or neuroscientist, has of systems that are normal and yet intermediate, tertiary, sui generis, or mockeries of the two terms serial and parallel; usually one thinks of these as cooperative adjectives that are destructive or synentropic. I was just looking at a case in point. A question was asked in an IQ test about whether any rearrangement of a word gave an isomer and after commenting on several sorts of investigation it occurred to me that the brain might stagger morphemic possibilities in oblique columns for an acceleratory switching or wide search that is at once serial and parallel but could well trigger an unseeing debate between dichotomic partisans, and that furthermore one might slice the slice by suggesting a natural method of clustering or the syncretism of a hierarchy. It is amusirg to think that these would have gone on and fought and killed each other and wrecked truth. With haste to the creche

The points listed.

One immediately thinks of all kinds of "diagonal" ideas. More broadly, there are lists, trees, matrices, nets, and the like and their synonyms &c. By a list I mean eg one could have a series of questions, tasks, modifiers, contextualizers, &c over which one might run eg a sight with the end product a memory eg going in or out. This is certainly serial enough but it partakes of a parallel aspect insofar as the stages in the operation are 'bulbous' (usually hidden in discussions) and the whole operation could be a virtual tree; now the stages could be identical and the set of stages could be reflexive or transcorrelated; but this is forgotten. But this is neither a crypto tree nor a quasi tree. The doctrinists are in stampede! Let them run, we have worse for them yet.

Consider the critical notion of parallelism in cognition. The critic might intend or suppose that this means, severally, that meanings, operations, or processes are complex or tandem, and in minimal all the way to maximal degree, and contend that this is false, but on the basis of such obscurity found a reputation. Now this is typical. It is not convincing but it is typical. But what are we to do, for the brain may use all of these things, apart or together, serially or in parallel? It may use them at the same time or different times, at the same or various places, for various purposes or in different ways, and in successive stages of ontogeny; and whether a brain does or not is irrelevant for a computer or a theory of the mind. Exemplia gratia, a scene may be analyzed by the brain in the course of which atoms of it (which, by definition, may overlap "in parallel"; which may enlarge, concresce, and hierarchize "in parallel") are simultaneously processed; this may lead to a competition which may be convergent or divergent and spring favored elements that could then in part be handled serially. It may happen that the shape of experience is dispersed extremely into innumerable fine interrelated criteria, and who is to say that this invention or application would be either "serial" or "parallel" by description or fate?

Of course there is also "holism" and one could then say that serialism, parallelism, and holism are in dispute. But this seems to make the dispute worse. We have conscripted the referee! Perhaps we could arrange the others in serial and parallel and put holism in between? It will be obvious that these are in part empty words. Certainly they are in conflict with one another.

What is meant by serialism is often that in eg looking at a scene analysis proceeds by looking here, there, and so forth; it is not clear how much looking is being done, nor where; often it is intended that classical features are detected and are sufficiently universal and/or powerful (or the world may also be so simple and/or perception) that recognition may occur; it is not clear whether the percepts are to be taken as end products or sources of association that are then used finally or exploratorily; nor is it clear (nor considered) whether the serial elements are themselves creations of original serial or parallel operations, nor whether the serial elements are represented as serial or parallel (eg distributed in space, in data, or elementary in composition). Nor are the parallelists free of this reproach, though the serialists take them as such. We are on very sticky ground, now, because the positions have dissolved into nothingness or at least the glue melted, and, after all, what are men without battle cries! Far afield, or AWOL.

What is meant by parallelism is often that a scene is averaged out. This may not be so different from serialism. Also and also, various combinations or wholes, within the whole, may be simultaneously perceived and then assembled in whole or part. This school may often be found condemning its bugbear for using too little of the scenic means availible. Both antagonists may rail that the other truncates the amount and/or time of processing in perception and/or conception and/or extravagates. Obviously this is rancorous. Don't tumble into the chasm.

There are fifth columnists, too. Someone may concede that "lower" perception (undefined) operates in parallel but devote "higher" (presumptive) conception to serialism, naturally; a little thought shows this silly in many ways as well as unclear. As already mentioned and as not mentioned, parallel operations may give the appearance of, operate behind, or concert with serial "operations". There is a difference over how much work must be done in the original synthesis of operations and data used in the mind. One may be able to use serial and specific operations or data but after a while these may fall into a morass of ambiguity whose only solution is a return to parallelism (or another pretentious choice from its cornucopia). To put it another way, the figures used in serial exercise may have such a complex of interrelations that the simpleminded serialists may be blind to these and provide neither switching system nor cornucopia. This harsh fact has an element of truth in it. There is a considerable tendency for those who have played with circuits all their life or the obvious to impose them on their world and take the illusion of their accuracy, adequacy, and homoousia; thus things are reduced to a cake and a pie.

Another rather odd fact is that parallelism may require serialism, if simply to bring its results together, or even more simply, to administer the manufacturing (eg signal its termination: ho!). It may be that the brain uses special means to cause that interrelation and transformation of wholes, parallel operations, or simply very large things that may describe thought; there are of course many psychological phenomena of mental blocking of wholes.

The parallelists often cite the complexity and versatility of thought in their favor, but of course they and randomness may be given by serial combination. Their opponents often cite the power of serial combinations and of obvious explicit "languages" (of whatever kind) used by man, but of course these may be implicit illusions and derivative contours of underlying parallel complexity.

PARALLEL COGNITION

Pat Gunkel

The words form a matrix; their modifications, qualifications, combinations, intersentential situations, and environmental occasions give the number of dimensions of the elemental matrix; within this, all meanings are specific to the degree they are in custom. It will be noted that any sentence is a process of specification eg; ie the role of many elements is exclusory and a certain degree of exclusion (in the above classes of and dimensions) gives the specification; as it were, denotations yielding connotations and at once vice versa. In abstract binomials, 10^6 words (the language) = 10^{12} combinations; 10^5 (typical vocabulary): 10^{10}; 10^3 (a basic english): 10^6;; one immediately becomes more interested in a hierarchy ($2\text{-}10^6$ words: $4\text{-}10^{12}$) of intellectual reference. In a few words (incl modifiers), (sentences), one could exclude possibilities and arrive at agreed meanings. Ie customary meaning does progress as the extension of exclusions, not precisely inclusions; the positive elements are evidently conditions of experience intercalating themselves in language. Remember however that the fine acquaintance with things is the ingredient for linguistic sensibility; a gigantic probabilistic range (certainty to impossibility) must leave its impress on verbal combinations (which ia originate words) such that of some combinations we might ourselves hint that these are indubitable and even universal, the "conductors" for subsequent superposed combinations, as we know from numbers, but exactly here do we see the origin and nature of my implication that the range of probability is from zero to infinity in mind's combinatory structure. It would be possible to take the average size of a sentence, and the mean, median, mode, or gross of its words' word frequencies (in standard use, now published) and compute the probability ie specificity of a typical sentence. This would be the "vague" specificity. Missing would be any register of verbal combinations "inbearing" meaning, of historic combinations, of person-world couplings (the body which is in one sense only trivial, the static structure of sensa conveying patterns, and in the analogue correlations of the mind's active and passive responses and interrelations with the environment--eg the specific way a person reacts across development through mental function has forgotten "analogue" specificity), the analogic and toward-discrete massive autocombinations of mind (whose synthesis may be indefinitely greater than the internal workings of any imaginable computer). It is to this that I wished your attention when I spoke of the homologic range of probability (the theology of language; all words are theophoric). There are doubtless ways of showing how all the data of brain (ideas, words, sensa) could have the developmental structure whereby the vast physics of the brain and the indefinitely vast possible matric combination of its particles or (it would follow) analogue states could so organize information that "brilliant" analytic matrices ("operations") would occur (eg very precise arrangements, very fine vast organic ranked practical differentiations, extremely good self-memory and its self-realization--or these things virtually and slightly); in this way cognition could be in parallel (or at first and later (which could be early in life) complacent and bothered only by what might be called "motivation for retrieval").

The argument for parallel cognition within the brain can very easily be shown. If, as is already typical, you concede that information is spatially dispersed therein and that afferent objects proceed to be recognized by their divisive ascent up "typological" decisional trees, you may be inclined to play along with other ideas and alternatives, such as that the trees are imperfectly described as typological and better described as "contimual", that, be that as it may, the very flow may be multivious, pursuing the many branches at once rather than unilineally, (or even it may be that your mind can befriend the notion that the essential to processing is that recognitions themselves involve dispersive integrations as instantaneous or final fusions between the branches) and you may even think this probable; there are many ways it could be probable, including that a few branches be taken or to a certain stage or to little more like a trickle (as energy or specificity, since the energy may lie in the performance of the many branches); so you may take the trees as amplifiers and filters instead of as segregators or mere switches.(many people, looseminded or latitudinous, do). The outcome of this might be that an object is not merely seen, monocularly, but is seen a thousand ways at once, polyopically, or infinite ways, panoptically; or at least the object may be disassembled by such numbers into so many signifigant and residual effects. One consequence might be related to the fact that you can easily imagine each dispersion, so to say, leaving charges that would then cumulate and eventually result in a system wherein an extremely fine-tuned mass discharge would behave upon events with great and yet parallelistic intelligence. More important, this system could operate bilaterally with efference (á tree with two trunks or an "air plant") in which case it would be nonexclusory and symmetric to the world and its parallelistic cognition is easy to understand and one may be friendly to it. Now of course this could mean that one could have simply spatial dispersion and parallel operation, but rather or obviously serial ideas, (hybridal "seriparallelism") or one could have parallelistically derived ideas which were spatially dispersed but masquerading or operating as serial, (hybridal "paraserialism"), or one could have not only spatial dispersion and parallel origin of some ideas, but cognition that ever operated in parallel and on the basis of information that was processed into and as parallelistic atoms ("euparallelism" (imagine a brain the hylons and psychons of which were as similar as possible: that would be euserialism; imagine a brain the hylons of which were as different as possible and the psychons of which as similar as possible: that would be seriparallelism; imagine a brain the hylons of which were as similar as possible and the psychons of which as different: that would be paraserialism; imagine a brain the hylons and psychons of which were both as different from themselves as possible: that would be euparallelism). Further distinctions could be made on the basis of the world (fortunately or unfortunately?) has a finite variety and also a prejudice to certain modes (perhaps a hierarchy) (the world includes the brain), & brain cannot have infinite parallelism but rather a finite, practical, interested, or sufficient amount (eg varietally and modally) (this refers to both material and mental parallelism, since spatial dispersion may be intensive as well as extensive and intensive distribution is limitless).

CONCEPTION UPON PERCEPTION

Pat Gunkel

Says Webster's, "Conception is the abstract, intellectual, or universal element in cognition as distinguished from the apprehension of concrete particulars in sense perception; the originating of something (as an idea or plan) in the mind; the capacity, function, or process of forming ideas or abstractions or of grasping the meaning of symbols representing such ideas or abstractions; a product of abstract or reflective thinking (as an interpretation or design): an ideal scheme or plan of action. Perception is awareness of the elements of environment through physical sensation: reaction to sensory stimulus; physical sensation as interpreted in the light of experience: the integration of sensory impressions of events in the external world by a conscious organism esp as a function of nonconscious expectations derived from past experience and serving as a basis for or as verified by further meaningful motivated action." #Conceptual v perceptual: abstract v concrete: universal v particular: original v received: dynamic v static: complex v simple: unitary v fragmental: obscure v clear! These may be taken as the two poles of a continuum: the job of the theoretician is not just to perceive but conceive it. #Recently I sat down and invented eighteen ideas. The concern of this article is the explanation of those ideas.

x 18

PMG: Only 12/18 were gotten to here — though others are listed afterwards.

(1) "Complicated prediction" refers to the fact that ecphoric percepts draw on objects and memories that are both meaningfully complex, for the sake of predicting what is there being perceived; this diversity of implications refers to a diversity of objects and their fuller specificity and details usable in the exact anticipation of an immediate object for the regression of the time, complexity, ambiguity, and imperfection of the act of perception but, more important, for the extensive abstraction of features and overall aspects in the conversion of perception to conception; concurrently there is a diversification and complexification of objects and perception in general by their contra- and sub-prediction and of course their integral assemblage, as well as an increased competence in the face of variations of form, example, and clarity of the object; any object objectively and subjectively somehow blends into a jungle of thick and temuous associations carry with them complications as to what should precede, accompany, follow upon, and explain objects, both as signs and as significata, the language of signs and the language of objects; a concept would imply a continual universe of whole and partial percepts in various relations, a percept would imply other percepts, signs, and concepts; one may that its machinery is given infra.

(2) "Retrospective analysis" means that upon the current solution (to whatever degree) of a problem by complicated prediction (eg in the election of an elaborate scheme) such circumvention or the like will be followed by an 'interest' in the tissue in why success was achieved, interest expressed in the solution and integration of other aspects of the problem or situation hitherto insoluble, inobvious, unworkable, unrelated, &c, so that the brain tends to fill in the picture of the world, say by the sustained prominence of former problems and eg their comparison; it is, in short, the value of the answer to the explanation of the problem and the pertinence of these to subsequent problems.

(3) "Competitive prediction" means that neural schemata, associations, and fluxions with their elaborate details will be in constant competition to simplify functioning by prophecy of immediate percepts and less immediate or more involved problems such as those supposedly involving 'cognition'. All the cosociated facts and processes of the tissue may be in the competition, and actually the eventual installation of some of these may be a slow, partial, continual, cooperatively changing, arbitrary, cyclic, degree-expanding, and arbitrary-competitive process. Put or as otherwise, all may compete to predict and correlate with some

overall state of the tissue, eg some euparallelistic integral(s), so the competition will be Janus-faced and translatory: predict the course of external things and predict the transcombinative course of internal things. On the other hand or phasally and saliently, attention may engage circumscribed pieces of the external and internal world for resolution; relatedly, one often thinks that the brain is quite content to 'get along', and, indeed, the concern with minima, isopores, &c (if true) does suggest that. On the middle hand, once the major and gross decisions are made and the material accordingly arranged, once experience accrues and time passes another form of 'getting along' may arise, the ochlocratic fitting of all neuronal possibilities together in a levelling to norms, a horizontal integration as opposed to the above vertical integration or the like. It would clearly be fascinating to explicate these possibilities.

(4) "Ascending elegance" means that a fitting (eg energetic) of all things in terms of each other and further experience may go on and an increasing economy, universality, precision, transformation, homomorphy and decrease of difference, &c may go on and release the energies and concerns of the tissue for further data, complexity, higher possibilities, &c; it in fact means that, regardless of whether successive stages of elegance are continuous, higher concepts may arise as the leftovers upon elegant assimilation and accomodation or that the variety of things may be finite and hence a hierarchy of elegance will equal a hierarchy of conceptual complexity, quality, simplicity, residua, universality, &c. I have also called this "minimization". It may imply "funicular age", "hyperplanar cubism", "distillation", "interlucation" or "pruning", "abstract disengagement", or the like: imagine a flower's sculpture tumbling tragically upon excessive whittling of the stem, that suggests the mood. I have once suggested the brain's life be denoted "silviculture": well, within the woodlands there may be "anthologia". There are also "fabrication" v "anamorphosis" to consider.

(5) "Competitive disengagement" means that successful (eg quickest) and superior (eg most versatile, most mass-solving of problematic implications, most 'appropriate' for other cortic states and patterns, most final and probable in solution) answering associations from complicated prediction may act at once or gradually to disengage other solutions, associations, tissual patterns, answer- and solution-facilitating structures, &c, so that a process of virtual or complete replacement may occur; eg for autolytic resource. See the previous paragraph. In this sense one may imagine that, as in certain forms of art and life, form, existence, elegance, and efficiency may result from a process of deletion, as indeed evolution occurred via the continual freeing of the Earth to better species. Dissonance may be relative. We must stop short of crediting the competitors with faces, a population, however it seems eminently reasonable to assume that in the tissue as a whole rather independent infirmatory attitudes and methods would actually evolve to antagonize competitors, whatever their genesis, simply because this is man and our subjective life; "what aspects could be faulty" is a thread that could easily evolve in the cumulation and proper perfection of diacritic① methods, as in the capture and advance of any other operations, per se. In fact in the course of any perception there could be (eg by parallelous "staggering") an extended turnover of alternative predictions ("sidestepping serialism"). An alternative, concomitant, or reviewing of this, infra, would be "redimensionalization". This process may be both "immediate" and "late". Many forces could be driving for and making use of such as disengagement, eg orthogonal clathration seeking for engagement and disengagement in terms of regular typologic lattices and in terms of substantivization by infinite extrapolation, which might also retain detail by "projective" intertransformation, autocombination (condensation), coenocentry, and the like.

{(e.g. Occham's razor; or anaplastically)}

① Definitions of "diacritic" (adj.) from Webster's III: (1) serving to separate or distinguish; (2) capable of distinguishing or discerning.

(CONT. FROM PAGE BOTTOM:) #"Mianalytic": From "mi-" (less, smaller, slightly, fewer).
#"Simplicihierarchic" & "Simplicirheic": the Latin root "simplici-" means, Simple (a word with many possible senses, incl. Simplicity, single, unmixed, fundamental, homogeneous, absolute, having no limitations, easy, etc.). "-rheic" is from "rheo-" (flow, stream, current).

(6) "Continual prediction" means that so-called disengagements are not simply retired or erased but continue to play active lives, reincarnations, or transmigrations in same, amplified, and/or transformed state; that a success is not simple but that answers are, as above, partial, tentative, cooperative, &c; moreover all information, operations, consignifications, associations, orders, &c may continually and totally (eg euparallelistically) function in prediction; euparallelism may of course go after infinity ("apeirognosia" v "peirognosia"), in which case states along the way may (eg dispersedly!) ever adjust and give instantaneous (transient) predictions, statement of solution, &c. Whatever, solutions must then solve each other and interlock in great complexity and an enormous refinement, variegation, and complexification by all solutions occurs. Or the term may mean that 'prediction' exactly is whole life: an incremental, partial, cooperative, subtle, infinitely cautious, perhaps infinitely elaborate, &c process thereover. One can imagine the celestial dome filling with stars and the light these cast finally combining below in all the colors of the rainbow or with their spectral signatures sorting, as objectively occurs, the objects of our world that fill our minds: the unition of such delicacy with such longevity is joyful. Also, predictions occur for the whole as to the whole and to the whole as the upcast of the mind.

(7) "Relative continuity" means figure completion and emergence of simply most-probable identifications eg. "Holes in the data" are not particularly bothersome to the mind because it relies on orders which are only but in fact the most probable, most evident, most regular, most defined, in a sense the most natural, most overall, most euparallel, most projected (eg as intersected lines), &c in terms of the comprehensive activity of the tissue (as where the averages of mechanisms, cells, &c which are basically invariant because of the enormous quantitative complexity and functional simplicity of a tissue (so that "the present is larger than the future") are at first ontogenically uniformized, then acquire engrams by coenocentric euparallel integration of functions, a process which goes on virtually 'forever'). Furthermore the attractions and success of "complicated prediction" may merely require the utmost simplicity and sketchiness of data for finding a suitable simple or transformed "translatory image" or even a "final image". One might also say of the tissue, because of euparallelism, that it is 'relatively continuous'.

(8) "Redintegrative abstraction" is the direction the whole process goes so that any and all parts of an experience may give recognition of whole or essential part, so that this may occur as excellently (eg quickly, variously, obscurely) as possible for each part and recall, so that data are progressively tied to conceptual integrations, so that concepts are tied to each other, and conceptual cointegration and progress ever occurs, so that most-predictive features of gross predictions (or for manifold interdimensional situations) develop and do so hierarchically and intensively (signal omnivariegation and etherialization); in this fashion it may be that processes progressively and inevitably replace states (perhaps replacing maxima by themselves-abstract optima) and processes tend to selective organic fusion and co- and pan-processual density, elegance, self-implication, and inter-implication. Or as I put it elsewhere, the world is rhadynamic, rhacausal, epitropic, and tight, and the symmetric mind is mogiphobic, mianalytic, simplicihierarchic, and simplicirheic. As above and elsewhere, the end result may be sparse, any data upon "flat trees" suffice to give recognition by combination, direct tabulation, or direct insertion. One might say that concretion and abstraction become synonymous. If the tissue becomes a "nest of hyperplanes" this treatment would be only natural. Perhaps this concept is essentially synonymous with "projection". Redintegrative abstraction might also be only natural if the "flow up decisional trees is in some degree (light, heavy, full) simultaneous for each event".

(1): #The words "rhadynamic" & "rhacausal" here I coined via the Greek prefix rhia- (easy, ready, light).
#I am not sure what I meant by "epitropic"; the two roots I coined it from have diverse and disparate meanings. "Epi-": upon, beside, near to, over, outer, anterior, prior to, after; "-trop-": turn, turning, change, direction, why; affinity for, tendency to turn toward, tropism; "-tropic": turning, changing, or tending to turn or change esp. in a (specified) manner or in response to a (specified) stimulus. Perhaps by epitropic I meant something like: turning, changing, tending, or attracted to whatever is (or is most) near. #"Mogiphobic": Gr. GK. combining form mogi- "(with difficulty, barely, with effort exertion, labor, pain, trouble) + "-phobic" (having an aversion for); so literally: tending to avoid or turn or evade away from what (ever) is difficult or involves pain or (non-minimized or relative) effort or work or action. (CONT. TOP OF PAGE 2)

(9) "Higher-order curvature" meaning the favorance of 'any' regularity ('however' complex) over randomness or any transformation yielding a proportionate efficacy. #I have indicated that in visuognosia the cortex may be at first little and then not at all affected by transformations required in changes in visual stimuli such as over celeration, complex curves, and just complex (but relatively simple) patterns of any kind (eg according to their predominance and essentiality, say to the relaxation of analysis in recognition by prediction), but I have put no limits on the form and style of those transformations. #My present concept says that the same thing holds for practically any nervous activity (eg sensory, motor, emotional, abstract-intellectual) and probably extends to some extent into very high levels of complexity, precision, &c, perhaps to the limit of some rule. The idea is that all objective or subjective experience may be taken as constituting an indefinite hierarchic continuum of residual difficulty of various computations, as filled with myriad computations by which there is a relative continuity, and that for some (limiting) reason man is able to progress some way up this transformational or "subtle" continuum--perhaps the essentials, whatever they are, for the kinds of problems he is presented, whatever they are. Despite the complexity and obscurity of certain transformational invariants, if these are critical and relatively outstanding, they are infinitely more outstanding and simpler than further possible invariants and the sheer random noise of experience.

(10) "Anamorphosis" refers to an important trait of neural tissue whereby it becomes progressively more complex in its representation and density of information. It suggests that this results in the information acquiring a progressively less recognizable form. Not only is the information physically dispersed in the tissue, its 'ideal' structure and mental operations become at once more complex, subtle, integral, powerful, &c. Recall that physical dispersion may occur both extensively and intensively and in these ways, especially intensively, infinitively. In addition, by the operation of complicated prediction et al selective and organizational processes may be brought to bear, so that isoporic "repeated inversion" may occur, meaning eg that the whole may be analyzed from many points of view and the absolutely best solution or definition of some situation may be pursued. #It is possible that the vocalization-specific superior temporal cortex cells of N. B. McCutcheon and J. Saunders, and the complex object (eg hand)-specific inferotemporal cells of Charles G. Gross, C. E. Rocha-Miranda, and D. B. Bender, are the end or high result of anamorphosis (intraclassificatorily and interclassificatorily, continual and statistically representative).

(11) "Algebraic quasiexclusion or redimensionalization" means that the result of prediction may not be exactly the elimination of some and retention of other possibilities but rather their interdimensional summation, either by a growth or allocative process; in short, a regrouping may simply occur as or plus a weighting. This process may of course be relatively continuous or discrete, relatively permanent or transient, &c. The basis for this might be the next concept.

(12) "Alternative clustering for hyperplanar semiselection and late exclusion" means that arbitrary sets of possibilities might be isolated and integrated as groups as instantaneous moments, specious presents, diachronic moments, or by some simple or euparallelous attribute (which could in fact be a common operation) and--on the basis of some success, other criterion, "three-dimensional mental structure", &c-- fused, interbred, or crossbred, or that the mind might in fact evolve into nothing but an (infinitely expansible and infinitely interrelated) "hyperplanar bed"; that one might expect that between (some) sets of hyperplanes or clusters like this (as well as within hyperplanes) (perhaps by the very measure of essential distance) unique, better, or special correlations (of operational or static kind) might exist or develop (by successive identical or simple capture). In other words, such hyperplanes would constitute an unusual class of order that might be random-continually or otherwise analyzed (eg as a utilitarian continuum in the case of problem-solving). Eg let's say that the response of the organism was successful on one occasion or several: hyperplanes might then crosscorrelate these, general occasions, or the "bank of the mind": what all possibilities are held in common? These could then be tested by further experience or by complicated prediction, &c.

Is basis of euparallelism?

(1) X complicated prediction –
retrospective analysis – (2)

(3) X competitive prediction –

(4) X ascending elegance –

? attribute reassociation –

(5) X competitive disengagement –

(6) X continual prediction –

(7) X relative continuity –

(8) X redintegrative abstraction –

? directed satisfaction –

(9) X higher-order curvature –

? operational devolution –

multiseriation –

? alternative interexclusion –

(12) X alternative clustering for hyperplanar semiselection and late exclusion –

(11) X algebraic quasi-exclusion or redimensionalization –

(10) X anamorphosis –

X delimal

THE HIGHEST REGIONS OF MAN'S BRAIN

Pat Gunkel

It is conventionally assumed that some regions of the brain are higher than others. These regions are not always stated and are poorly defined. The presumption is that there is activity of the brain which deserves to be thought of as "higher". There is a tendency to equate height and anatomophysiologic obscurity. But I myself believe that there are things to be put above others in ranking our humanity and that their evolutionary explanation lies in new regions which are theirs. These things form the topic of an article in which I diligently ask myself what processes should or might owe or confine themselves to our highest regions.

Let us begin with a high level of abstract speculation.

Expansion in the prefrontal region may have served the creation of quantitatively or qualitatively unusual emotional operations or conditions. What and which emotional operations might these be? Maybe parts of this/ plus other cortices ~~is~~ wired in one of many ways. The ratio of afference to efference might be unusually high and might effect a contemplative sector of mind in which only particular, large, and/or overall afferent events would effect efference, with the cumulation of peculiar concerns; or theoretically efference might be particularly driven; characteristic memories might form such as pictures of the environment, of self, of time, of memory generally, of motor actions, of particularly radical changes of the lower regions, of emotional consequences, &c; possibilities for and of action might arrange themselves consecutively. Or both afference and efference might be unusually low but perhaps one or the other dominate; unusual coordination might be essential that efference effect the behavior of the organism, as in impulses, sudden ideas, emotional reactions, alternations, periodic guidance of lower behavior and regions, longterm rhythms in behavior (such as due to switchings from seperate prefrontal areas or prefrontal states); conversely, only especially intense or decided (eg final) states of lower regions might sway and breach into the higher; the highest regions might be unusually autonomous and freethinking, or pursue abstract (eg selective), complex, contradictory, and assimilative thought; or in them the material might, because of the passivity and perhaps independent activation of these regions, be unusually fine, rich, complete, stable, permanent, textured, luminous, multileveled, continuous, plastic, spontaneous (eg labilely forming and again dying out), and/or competent; any detachment from action might create a timelessness and hence, paradoxically, an awareness and <u>potential</u> measurement of time. Or such speculations might hold for a possible smallness of the afference/efference ratio. Or, possibly more importantly, such cortices might be unusual in the degree and sign-sign ratio of their efference and/or efference generally or at various sites of effect, or in coordination with one of the above circumstances; possibly unusual in being bisignal, multisignal, and/or balanced where other regions might be mixed in cause or effect. Such cortices might be unusual in their intraconnexion (eg by being areolate) or in the kind of their internal and/or external reciprocity (monosynaptically or multisynaptically).

What is an emotional operation? Would emotions be able to pick out and guide muscular states and processes and/or sensorimotor coordinations? Would a combination of emotions and acts result in this area in an emotionalization of acts (say atop other regions), a synonymity, a growth of affective motor imagination (ie will?), an independent affective-motor life, or the like? Might there be in this region, perhaps in that connexion, a strengthened representation and competition of various or all 'drives'?

It is characteristic of higher intelligence, animal or human, that the individual will occasionally pick out and concentrate on particular stimuli, actions, thoughts, and perhaps emotions, to the exclusion of distractions. As we go toward man we see an increase especially of thoughtful, sensorimotor, and perhaps emotional concentration/and suspension. To what degree is this true and are there changes in all possible ratios and absolute non/seperate extent or depth, especially from the chimpanzee to man? Have there been qualitative changes in the ratios (reequilibrations) by crossing 50:50 hills and the like? How does one area of the cortex control (eg preempt activation) of the others, and to what extent is this control gross and/or automatic versus fine, complex, extreme, and/or voluntary? Does some balance between regions determine dominance or focus, such as anterior/posterior cortices', association/sensory cortices', motor/sensory, emotion/sensorimotor, mnemic/presential cortices' ratio, and has adjustment or reequilibration of any or all of these ratios occurred approaching or with man? Has the cortex, or especially association or highest regions, gained power and/or fine control over part/all of lower neural regions, such as the brainstem or diencephalon, and/or their function, or have highest regions assumed such over lower cortices? Have specifically changes in corticocortic connexion been critical, quantitatively or qualitatively by quantitative and/or quantitative mechanisms? Has, on the other hand or also, the cortex or highest cortices fallen from the spell of subcortices and/or lower cortices, and/or developed control over and/or between themselves? Apparently (but in all cases?) the cortex is more likely to have assumed such power by greater interrelation with rather than withdrawal of lower nervous regions; but one might ask of these regions whether new heterogenization and/or homogenization has not altered or obliterated functions within them? For intrinsic and/or extrinsic reasons has the signality of the, higher, or lower cortices qualitatively and/or quantitatively changed and, if so, by what mechanisms; eg through intensification of intrareal and/or interareal signality and/or bisignality, and for some overall effect such as an increase or heterogeneous decrease of habituation or inhibition, or some time-sharpening, spatial in/decrease, or the like? Have perhaps changes specifically at lower regions, such as primocortic cytoarchitectonics, been at bottom of apparent or real refunctionalization or transformation of higher cortices? Has there been some removal of any ability of (some) cortices to satisfy or quiet sources of their arousal, or vice versa? Has some control been gotten by the cortex or higher cortices over the essential basis, very origin and degree of emotions, or some critical marginal difference been effected in any degrees or sources of drives; has the source of cortic activation become basically cortic in administration or manufacture? Has the cortex become a new type where its posterior and anterior, or the like, alternate and/or compete in controlling the degree, location, and information of some, most, or any arousal? Or has arousal become a different kind so that, or is it true in general, both arousal and so-called nonarousal may involve equivalent or active states? Have two or more inhibitory systems evolved or 'equalized' or grown vis-a-vis other (eg excitory areas, or versus neutral areas wherein such systems may or may not compete), such as prefrontofugal cholinergic v hippocampofugal serotonergic; or have such systems recently become inhibitory, excitory, mixed, or multisynaptic; or have such systems become corticopetal or mixed, or the different systems (eg prefrontal v hippocampal) become reciprocal? Has the striatum recently become, become more, or become mainly corticopetal to certain or many areas; what has changed in the striatum generally, and may it have become a neuroendocrine or productive source for the chemicals used by and/or on the cortex or undergone a quantitative or other change in this respect?

x (It may, of course, be that an equality of connexions is relatively unmyelinated, equality may be late, distribution may be exceptionally diffuse vertically, horizontally, fibers may be thinner; [illegible] dependent of this time, synaptification may [illegible] from arborization, etc. further, which is the quantitative difference.)

It may be suggested that such areas as 7, 40, 21, 20, 9, 46, 10, and others are specially developed in man as having few corticocortic connexions (or these mostly afferent), perhaps few subcortic connexions one way or the other, and, especially, by having mostly intrareal and intensively local intrareal connexions, and/or perhaps very few connexions of any kind (or this may hold for certain cooperative areas).x Conceivably these areas favor connexions to certain nuclei concerned with the reflection of general state of arousal or of particular drives or attentional processes and nuclei that may themselves be very isolated in similar ways (such as the pulvinar and dorsomedial nuclei of the thalamus), in which case the areas might support an extraordinary association of grosser activities with criteria of success and direction in the animal. It is possible that areas where the efference is especially low compared to the afference (such as area 40 and certain prefrontal areas) may in this way favor temporal functions. It is possible that this localism or "punctalism" of connexion has hierarchic poles at area 17 (or is this a deference for the sake of dispersion at 18 and 19?), the hippocampus, the last cortic points to ontogenize, the frontal pole or instead area 46, if not the hippocampus then area 20, &c; it is apparent that a trend to localism could work an exponential and transcendental difference in cortic function. Possibly in late ontogeny some or all of these areas could eventually develop relatively nonlocal and interareal or subcortic connexions, possibly for the sake of transcendentally imposing localistic functions on subjugated lower tissues. It is possible that the extremely low number of corticocortics (and other isolation) in area 20 gives this area its function in longterm holistic memories (and their roles in the appropriate kind of thought). Cortices such as the above, if they received an extraordinarily disproportionate amount of afference with meager efference, could be quite lively and yet reluctant to act so that their final conclusions could be quite advanced. Cortices with little afference or efference and yet extreme localism could function as elongate hypercomplex filters producing outcomes the peculiar reflection of hyperassociative longterm cascades, operating almost or in fact horizontally. It might be very interesting if such or other cortic areas had one-way connexions with certain limbic areas (either way or thus in complementary areas).

In an article titled Spatial Synchronization of Cortical Potentials in Patients with Disturbances of Association N. A. Gavrilova says that, in using M. N. Livanov's multi-point (eg 50-point) electroencephaloscopy, in the normal person the smallest number of positive correlations between points is as a rule found in the prefrontal areas. Conceivably this suggests the above localistic connexion of this cortex. (The correlation rises during the solution of mental problems.)

THE FORMATION OF EMPTY SETS IN THE BRAIN

Pat Gunkel

It is envisaged that this is a process of abstract commitment of cells that serves detailization and generalization. Imagine that a sequence of shapes having homogeneous surfaces is experienced by a tissue. The extreme homogeneity over one of these surfaces would conduce by its simplicity to extensive and intensive association of cells experiencing effects conditioned by the presence of this stimulus; this preferential cosociation of groups of cells and of the cells and pile of the tissue in its entirety as a progressive pattern of transformation abstractly weaving one pattern of cooperation of the cells from out their infinite patterns of incessant convergence and divergence, would in a similar co-infinite way establish in the tissue, in effect, a "mode of oscillation" involving a definite pattern in spacetime with correlated probabilities and therefore applicable to any subsequent pattern of stimular experience possessing a complex crosscorrelation with the former tissual and experiential pattern, such that it, the subsequent experience, would be analyzed into a diverse and yet integral correlation and specification, subsequently itself and cumulatively applicable to ongoing experience; but note that on the basis of any two experiences the tissue would have acquired a bipolar continuum along which any such experiences in the future could be ranked, and yet, an immediately intricate continuum, only capable of specification along innumerable points or aspects of subtle crosscorrelations in the flood of living experience irrespective of such a paucity. Furthermore, enlarged experience would serve: i. the integralization of the cells and states of the tissue, eg in a way resisting the distractions posed by the alternative modes of analyzing an experience and the noise of the intrinsic activity of the tissue in part representing perseverative and assertive processes in the tissue pertaining to engrams, ii. the acceleration of the acquisition of definitude in the tissue encountering variously novel stimuli, eg with respect to the use of this phasal definitude in the postperceptive conceptual processes of the tissue, as we may refer to them, iii. the intensification and organic coordination of states reached in this tissue with states in other tissues effecting motor and other processes, eg in the stem, iv. &c.

Moreover, the formation of groupings and modes of grouping in the stellar play of the tissue's cells could abet any recognition and memorization of either noise or pattern regardless of its complexity or right to be called abstract, thus truly qualifying these sets as "empty"; it is to be seen that any and every learnt pattern of the tissue will involve an aspect of concertion upon an occasion of experience. The result of all this however will be the initiation and development of a calculus of ideas or a euparallel machine whose myriodimensional 'space of ideas' will serve the identification and interaction of those percepts of such complexity and subtlety that we distinquish them as concepts, in terms of those commonalities of experience of relevance to behavioral function as in the modulation of matric motor processes.

THE IMPORTANCE OF LOGIC TO THE PREEMINENCE OF MAN'S INTELLIGENCE

Pat Gunkel

Surveying the behavior of all animals one is led to suppose in man there is some element of genius not to be found elsewhere and perhaps this element is of a logical kind. Comparing nervous structure and function in man with that in animals identifiable changes are suggested that could well account for this distinct logical activity or proficiency. This enjoins an investigation into the nature of logic and a suspicion that this is not really appreciated. It may be suggested that cultural acquisition of language elicits logic but it is also likely that an innate propensity for logic basically enables the acquisition and application of language: it is appealing to suppose that language is the product of a logical creature.

Aspects of logic: perfect and imperfect conjunction and disjunction; universal necessity, particular necessity, universal contingency, particular contingency, universal impossibility, particular impossibility; singular v particular concepts; eduction: conversion, obversion, contraposition, reciprocation, and inversion; contradiction; divisive v collective concept; quantification; comprehension v extension; deduction v induction; &c. These aspects, falling strictly under the head of logic, join with aspects of our language, and their underlying mechanisms, and together give intellectual capacity. Observe any sentence and you will see that its bases are such logical operations enabling a peculiar sorting of experiential material. At once it is clear that the existence and definition, and relative exertion, of these operations distinguish man from all animals. It cannot be without signifigance that there are circuits--more or less known and postulable--enabling such operations. Nor is it hard to assume the virtual absence of these circuits, and hence logical operations, in anything below man. Furthermore, the developmental operation of these circuits and logical operations will clearly, even distinctively, transfigure mind, liberate self, and alter throughout the style and products of the brain, the motivations, the emotions, the perceptions, the behaviors, and the associative processes that then become thought. It can be said that man is a logical intelligence. In the rest of this paper I will describe the nature of logical operations, the assumable neurological machinery, and the composition of these two in the genesis and life of a human being. Elsewhere I will extrapolate the three to the superhuman.

served EEG desynchrony hence cortic autocosm;
complexity, pluralism, and continuity of analysis and
thought, plasticity of cortic state (memory, hodology),
&c?)

VARIOUS CONCEPTS THAT MAY BE USED TO EXPLAIN OUR INTELLECT

Pat Gunkel

Of the hippocampus, active memory, perpetuated analysis, descending inhibition, the perception of time, automodulation, autocosm, autoexcitation, active comparison, ratios of values of old over new memory, vivification and equalization of the past, transistentialism, takeover of drive, deafferentation, intellectualization of action, greater emotionalization cum generalization of old memory, power over the selection and coordination of old memory, interspecific electroencephalographic acceleration expressing greater (eg facultative) dissociation of cellular activity or at least that part enveloped in the Eeg, &c.

It may be entertained that 'long' memory is requisite for thought. But the nature of such memory may actually be or the memory may be derived from active memory wherein recent memories remained assertive, interactive, &/r dominant at particular intensities, for particular durations, r/&c. The advantage might be for such active memories to regulate and impose themselves on the sensory and motor cortices or the opposite, to develop a semiindependent center of memory not in conflict with those cortices. The consequence of a prolongation of the activity of memories (which might have its human secret in strict continuity and eternity) might be an ever-subtler classification of elements, as opposed, in stark contrast, to the seeming evanescence of analysis in the transient evoked potentials demonstrated in lower and intermediate cortices, whose orientation might be more to the immediacy of response. One might imagine that this activity or its memories might function to inhibit or modulate nervous paths in the lower nervous system or cortices: to promote change after habituation, to exclude certain patterns of change, to enhance the power of initial traces of ferent stimuli and perhaps complicate these lower regions, to give signatures to afference, to increase information, to serve self-aggrandizement in higher cortices, to regulate the power of generalization &/r specification of information, &c. Dromes of the hippocampus might serve to give a serial extent enabling the arbitrary analytic reseperation and reconstitution of information and the serialization and operationalization of mental ideas or of the record of any memories; the Papez drome might serve to spectrally distribute evoked or formative memories over the length of the cortex feeding lengthwise the gyrus fornicatus. Active memory may have the effect of trying to get memories inserted into the informational texture of the neocortex or into direct experience, a sort of 'pushing of ideas' or "salemanship", ie "obsessional salemanship". Psychomotor epilepsy about the anterior temporal lobe suggests the insertion of motor patterns into the hippocampus; were motor and emotional memories to be stressed over sensory, toward man, in this hippocampal input, the being might become infatuated with the manipulation of sensa or higher sensa, and perhaps an emphasis of the hippocampus as the site of convergence of these two themes, instead of before the hippocampus, might emphasize active over immediate memory or reaction or, conversely, the contrary emphatic convergence of these streams in association areas well before the hippocampus might serve the complication of immediacy; it also might be imagined that this convergence, or these flows, might be spaced at a continuum or range of distances from the hippocampus to scale and complicate modes of association, as in a multilevel intellect. It is perhaps interesting that the permammillary hippocampofugal route is so strengthened in man, with Papez reflection, because, not only would this potentially elongate and intellectualize arousal or emotional process by direct subtraction but the accruals in the gyrus fornicatus, temporal, and other neocortex would then impinge a fortiori on the stated processes, competitively with concurrent more-immediate hippocamopetation, a ratio dependent and derivative of, moreover, the other content of immediacy, eg so that exalted superimposition could thoroughly direct mere-experience; changes mimiced by corticoamygdalar, -hypothalamic, -reticular (eg qua loss of a eg-unidirectional intralaminar thalamic system in favor of contra- or bidirectional association nuclei?), -motoneuronal, -cerebellar, &c improvements, eg wherein a stabilization, lability, autocosm, and infinite progression of thought (and associated subject) could occur.

2 (Eg where intradromic, eg hippocampocentric,

cont. from bottom: As to "triangulation", imagine the advantage if man had (or had the power to have) a double perception of things (e.g. the [concept of or object] and the percept), with extremely good, voluntary, or complete (e.g. orthogonal or antagonistic) separation; a triple perception (the percept, the idea, and an aloof remove or independence of these two, rather than subscription to either or both), or arbitrarily-numerous perception (in a Dunneian sense, that is ability to develop or habit of acquiring successive or infinite distance on any idea or frame, seeing oneself seeing ad infinitum or mobility). Another active, behavioral type of "triangulation" might obstruct ideas so as to enable a setting where implications would have to live, producing a resonant autoreactive, yet hierarchizing, being, with the gained consequences of any aboriginal beginning infinitely strained, multiplied, transitive, & continuous).

A) A particular strong memory could be active in man so that when gone the person away from an object its image (or some dispersion thereof) persists in the mind with an equivalent vividity — imagine how important this could be (esp. with a phylogenic extension of capacity for persisting — or actively — holding this on a greater multiplicity of such images or dispersions) e.g. for cognition since then detailed & abstract (since the image would be detached — ironically, concretely — from its specific form and could, if the retention [where?] would very intense, lead to the substitution of an arbitrarily greater complexity & processing of aspects within the image and between it & memory and the ongoing external perception) treatment could occur, yet ironically without the interference usual in less vivid and less analyzed impressions. One can also imagine a human mechanism for shutting out conflicting or other external images to allow other internal images & treatments, a facultative mechanism able to be conditioned as a voluntary will. This would lead to a peculiar mind trans-ontogenetically where the origin & nature of this mind would not be apparent later on or at a particular moment, and the productive or identifying mechanism could fail & split the person deceptively present.

B) (Keep wondering whether a "stereoscopic or triangulative" principle might be cultural in man, much as binocular viewing can create fantastically insightful perception of depth, tremendous orthogonal and "circular" (exhaustive) room; some such mechanism & effect might be proper to man, e.g. if he viewed a scene or conducted thought multiscopically, pluralistically, multicursively, or antagonistically. This could lead to "depth", game-theoretic progression, objectivity, the ability to see and the tendency to "push" alternatives and see shift perspectives, etc. ((... A above))

could serve to "clean up" continua or it could be more selective.

2 (also convergence of topology into algebra or their exchange: universals--'concepts'--would be retrieved)

CONTINUED COMMENTARY ON THE BASIS OF CONCEPTION

Pat Gunkel

We imagine that percepts are transferred into acts. In the course of doing which a fragmentation of the percepts occurs as a differential way of both arranging the percepts neurally and of acting. If this fragmentation is recurrent to the source of the percepts, recurrent qualification of the percepts may be made complex and a complex spectrum of dynamic operations may evolve as arrangement of the percepts' information.

If notes of different frequencies are sounded, their perception may take the form of linear (isonotal) or cross-spectral (complex, internotal, n-dimensional) summation: in the one case yielding a universal profile and in the other a galaxy of n-dimensional neighbors nevertheless variably and rationally spaced with respect to one another (difference by commonality). Missing, however, is what I'd call an "active metric", that would be additionally supplied were there to be a circuit of recurrent emphasis or active convergence, eg "you say this is different than that, but how much different is this than that, and of that, how much alike is it to this and that over here, and of that, how does it compare with the original elements" supplying a measure of the measure, and an active measure, since the process will always be discordant ("if the part is the whole and the whole is the part, how is it they are two; and, to what may the whole, as part, be extended" &&c). Only by such active processes would the notion of the scale of frequencies evolve, including the notions of arithmetical and logical quantity. The Papez circuit, of course, involves a finite interval of time whose discreteness, elongation, repetition, continuity, and resultant gradience could serve the bare perception of time; in some fashion, in the above way, the independent conception of time could involve that circuit. Is it possible that some of the first concepts animals had were temporal and not others? In any event, the Papez circuit could serve to quantify the complexity of other operations of the cortex since it would provide a notion of characteristic difficulty; this notion, it needs no saying, could serve, uniquely, the selection of different concepts and percepts over one another and selective conditioning, a very important feature of intelligence.

The quantification of difficulty, qua difficulty, would also be important since it would involve transformations independent of some quantities and, therefore, rescue qualities or concern the invariance of any transformations of quality, which approaches very closely some of our ideas of apical mind: the stress would be placed upon the formal economy of thought resulting in thought for thought's sake or the extrapolation of thought and the recognition of categories of thought; noting the recurrence, thoughts would be able to contain themselves.

In the elaboration of thought, the role of alternation could be very interesting. If a train of thought, of association and deduction, is triggered off externally or internally, this could proceed in The Most Probable Direction or a particular direction (say, primordially, by a chaining of associations); but what great value would inhere if the brain, as it seems to, had a system to voluntarily suppress this immediate or possible train of thought and, by particular contrast (say subtle alteration or modulation at stages of thought), to follow through and have available another or n-other trains of thought--in this fashion appearance and reality could be seperable, consequences of different types of thoughts could be tentatively explored, alternative thoughts could be serially or then-parallelly compared as sequences properly or as products, a rich imaginative life (the universe of possibilities) could ensue, thoughts could be abstracted (eg by cross-analysis), &c.

One possible role of alternation could be as a service to synecdoche, effecting voluntary logical operation; if an entity could, by recurrent circuitry, become reflexive, it could synecdochically become transfigured through analysis of its extensional and intensional limitation, surrendering germinal sensum into pure idea.

3 (or do concepts breed themselves, intertypally?)

Another function of "alternation" is that it could greatly facilitate the brain's ability to learn, to learn subtlety of distinction, to have learned a certain sum quantity episodically or accumulatively (the qualitative richness of ideas would be increased and their number; expedience of association, controlled and countered, would be reduced and de-emphasized, and with this de-emphasization the psychology of the brain might become one of the direct pursuit of power, absoluteness, refinement, intricacy, interrelation, creation, generalization, &c of ideas; &c), to reverse ideas (eg the initial start and sequence could be arbitrary but alternation would be necessary to subsequently admit other starts, other sequences, other associations, other combinations, many combinations, or free uses of parts as symbols and 'then' things (note the continuum of degrees of analysis and representation whereby things become symbols become functions, so that relations, having different 'size' but being things, are submersible as functions ie things and functions are cocontinually interchangeable so that instead of "alternation" one can speak of an equality of distance, of nonidentity, and of a disencumbrance of association), to think concurrently and complexly, to think symbolically, &c. ¶Imagine that with a normal association, due to a stimulus, a compaction ("theatric convergence") of all kinds of data, processes, concepts, and analogue values and the orientations of these would occur, like an hysteric perspective focussed and structured in a way (prejudicial pluralism); this "pit focus" might, however, be suppressed to surrender the brain to extravagant extension of thought (across the distance and depth of the focus) to effect a "globe-trotting mind" in man characterized by enantiomorphic dimension of thought, gigantic breadth and range and complexity and detail ("detail through generality") ("pretentious infinity"; "sphericity"; "topology" (interior-exterior syncedoche) of thought ("arachnoidy" eg "explosive eversion"), intergeneralization, "tessellation", "pandivergent complexity", "economization through complication, levelling, pointillization, unification, fluidization, equipotentiation, &c of thought" (euparallelism), (the mind could be converted into a topologic sea and surrendered to swimming; if euparallelism were sufficiently great, it should be no surprise that man originates symbolic languages as he does, since the functional interrelations and detail of association would become so great that the concreteness, literality, specificity, individuality, nounness, 'uninomialism', &c of things and the events would become diminished, negligible, or actually negative, allowing an arbitrariness of choice of association and reusable symbols; it is important to note that this arbitrariness and etherialization applies a fortiori to the processes in his head). ¶This ability to climb out of a pit focus through alternation could mean, through alternation, that man is able to view verbs as nouns (and hence have "verbs") and to hypostatize things into tools, symbols, utilitarian values, ideas being bricks for environmental buildings, &c. ¶In fact, since the rat's hippocampus seems to involve a flickering snapshot memory of the image of his spatial environment, it could be suggested that the importance of this alternation is pit climbing for the above advantages, eg multiplication of detail or thematic detail by intense analyses within successive moments of time, exploiting interruption of continuity (a train is broken up into cars so that it can go around bends and equal loads); it is perhaps interesting to consider what it would mean if neocortex rc were to gain some control over the Papez circuit so that it could regulate its velocity, volume, information, &c and perhaps therefore eg vary the perceptual or conceptual rate of time or of processing certain information or vary the control over itself. ¶Furthermore, alternation could serve as a switch of behavioral routines or geneses and therefore complicate behavior (and thought &c which is contentially and structurally dependently paired to behavior; a salient characteristic of more intelligent life is in fact the complexity, variability, and intentionality of behavior and the independence of this from so-called innate mechanisms or instincts). ¶A characteristic of insanity — and insanity is apparently related to the limbic system — is gross failure in the alternation of behavior and subjective experience; the lighter insanities, such as neurosis, possibly being lighter failures.

¶(note how this vibratory switching of behavior would lead to a comparison between different rates (or rates of change or n-dimensionality) of behavior)

To retype:
Put 'articulate' a note, and 2 parallels as three ¶s.
Please note: None of the parallels contribute as strictly synonymous ...

It is very interesting to take the "active metric" of the second paragraph and apply this to the rest of the mind eg other senses. If I look at a picture and see its corner and this corner is suppressed by alternation, there may follow upon this the recognition of another important aspect of the picture left in the clearing ("sifting"); this process may in fact be very fast and very complicated and there may rapidly pile up, on this occasion and over my lifetime, a tremendous mat of deciduous leaves ("defoliation" or "matting"); in this emphatic process corners could be assembled into objects and objects into objects; this concept of critical organization from emphasization applies with joy to motor processes as well and one is immediately reminded of the simply [nonrepresentational, incommunicative, improgressible, or &c] fingerpainting efforts of man's so otherwise close relative the chimpanzee, so that areas like [40, 7, 39, 37, 46, 45, 10, &c] could well involve the imposition of voluntary alternation upon the multiplicity of the brain's activities to effect the evolution of mind into abstract patterns, abstract hierarchies, and the supremacy of the voluntary ego.

THE EXPLANATION OF MAN

Pat Gunkel

I am willing to bet that the reason man is not an ape is that kinesthesia and kinognosia are bent back to high sensory cortices; another, concomitant reason may be that via these cortices and other routes additional emphasis is placed on the transmission of the former information to the "second final path" of the cortex--limbic areas regulating attention or the control of drive--relatively or absolutely to degree of subhuman channeling through the "primary final path" of abstracted motor pathways; and perhaps, for both these things, reduction or displaced control of motor paths prior to high sensory and limbic cortices has occurred; whether the reverse, sensory-to-motor, flow has been absolutely or relatively reduced or symmetrically and synergistically augmented is, though greatly interesting, unknown to me. ¶ By "kinognosia" I intend that information present in the very tissues, eg area 4, originating motion, and informing of of motor will, is likewise conducted directly to the high sensory cortices (an interesting complementary or alternative speculation is whether, perhaps bidirectionally in addition to development of corticomotoneuronal area 4, increasing seperation of kinogenesis and kinesthesia has occurred in favor of higher motor cortices themselves acquiring more direct and adequate connexions with motoneurons (in fact, the cophylogenic stress on areas more anterior and posterior--eg area 7--to the Rolandic fissure could hint this particular complexity of phylogeny)--the distribution of the pyramidal tract perikarya in man is actually very peculiar in its hiatuses, breadth, and relative emphases (possibly deviating from near-humans)). ¶ This immediacy, regularity, and perhaps importance of motor-to-sensory reflection could lead to the sensory symbolization of motor acts. Might, therefor, changes associated with the basal ganglia, thalamus, subthalamus, hypothalamus, &/rc have led to the spontaneous reversal and activity of (vocal, facial, manual, truncal, ocular, &/rc) gestural musculature, formation and intimate sensation of which would be funneled back to the high sensory and limbic cortices? ¶ (It needs no saying that hippocampofugal, diencephalofugal, &c information on drive could have been increased to a gyrus fornicatus whose other connexions to and from the neocortex perhaps coincreased, along with cellular development of that gyrus serving analyticosynthetic and mnemic complexity, say with pertinence to protosymbolic traces.) ¶ The role of basal ganglia in conditioning and, indeed, in the ontogenesis of any expressed mentality, is now becoming known; there is indication that the partiality of defect from frontal lesion owes itself to sparing of basal ganglia, and that by implication the function of the frontal lobe is essentially that of lending complexity to basal ganglionic function. ¶ In view of the above, it becomes critical to determine the intermediate or recurrent function of the pulvinar, centromedian, laterodorsal, and dorsomedial nuclei of the thalamus, to the extent that they supplement, complement, or underly the foregone possibilities. It is an interesting surmise whether the extrapyramidal system has been to some degree taken over by, or is synonymous with, this reflective motor-to-sensory system. The prefrontal areas could, when active, arrest action and stimulate thought, which in the high sensory cortices, through an increase in the proportion of subordinate kinogenic information with superordinate polysensory and indirect affective conception, would take the form of sublime symbolism; where the fronto-orbital areas serve the generalization of the emotions.

{Change this clause into a separate sentence wholly enclosed in parentheses: "(—.)" Either to end ¶ as in its own ¶.

(Eg self-symbolism?)

It should not be odd that I assign the role to the basal ganglia and make the pairing of motor with sensory functions that I do; after all, the extrapyramidal suspension of action for the sake of complication, the sources of stereotypy (both motor and psychic), the source of the important refinement of action in man, &c are well-known. Why shouldn't similar developments occur for the control of perception (eg of concentration, persistence, autonomy, and complication of attention to sensa or thoughts), perhaps mediated by or correlated with a similar system? The fixation could involve the association of old and new memories or of old memories with some aspect of immediacy, which is exactly what you'd expect through some elaboration of the Papez circuit and, perhaps, the influence of eg the pulvinar, receiving from the cortex, and acting to sustain eg reticular activation and perhaps actively exclude conflict from other possible recipients of attention, an allocation of attention, as we've seen, that could involve motor-sensory correlation rather than either one alone; it is interesting, in connexion with whatever neuroanatomy, that processes of attention involve orders of transformation that are themselves typical, so that the dual concept of loops and toboggans, that I've applied to movement and vision, applies to the transformations of pansensorimotor attention as well, and would seem thereby to yield what are usually described as cognitive processes or the power of thought residing in its flexibility of self-direction and relative independence of particular stimuli; in fact, note that the reflection of kinogenic information could promote (prior to action) anticipatory alteration and hence complication of action, the insertion of an intermediary stage (direct or effectually) into the process of action and reaction (so that formulated action, rather than being automatic, would be anticipatorily reviewed and perhaps specifically treated as an array of possible perceptions or as a perceptual or recognitive scheme), and the generalization of the emotional content of action, specifically in terms of the induction of elaborate schematic memories, old and new. Action would itself become a scheme of perception, producing an inertia of action with perhaps the bias swinging to the passive and sustained imagination, idealization, abstraction, and operational representation of action, and along with the process of reflection of intention and cognitive idling would come concrete and expansive self-visualization: the actor in the setting and the actor with "free-will". Any such suggestion would seem to require supersession of control of vagaries of subcortic mechanisms modulating activation and behavior with reciprocal, determinative effects on the cortices at issue, perhaps that the last have continuous autonomous transformations across the life, in place of a crude code of conduct that is the dominance of all concern and the usurper of spiritual freedom, a freedom that could consist in the ability to suppress an entire pattern of behavior (reflected action). Furthermore, this use of symbols, handling situations, could cause their complication and multiplication via, in this species, profound contrahabituation; the operational persistence of these symbols, as the minimum of their exertion, could mean that the possible contrahabituation would lie in the velocity of their constant sorting and regular interchange, in condivergent intraclassification, in logical operations of inclusion et al, in their mapping of the total world, in their inversion of things into operations and operations into things, in their generalization of occasions, and the like: this process of inclusion (actions into perceptions, parts into wholes, wholes into parts, wholes and parts inter se, &c) is particularly interesting since it leads apparently to Alfred North Whitehead's God (the external includer of inclusions) and also to aetiological thinking of arbitrary complexity (since everything is included, concatenations and all) and to arithmetic and algebra (abstract actions or insofar as distinct from language proper), in an intuitive or formal sense (the possibility of cultural transmission).

Note to Previous Page

1 (It's easy to imagine the various primary and higher orders involving a type of space involving (eg "abstract") transformations of attention, psychology, will; this is also a language that would be readily communicable.)

2 ; does mathematics represent the abstract grouping of mental energy, liberating the mind to arbitrary complexity through complementarity and cooperation of precise mental and external grouping? The ability of precise control of mental energy or even local transformation? If man could have gained control over his vestibular system, control over arousal and precise transformation of arousal (in the above sense) could have been gained (eg complete ('perfect') mental) {e.g. guess!} the cerebellum et al could have been developed therefor; these things apply as well to centrifugal control of all senses (eg for reversal) and arbitrary manipulation and construction. (5)

{B} x

3 Epistemology: topology plus algebra plus set theory!

4 If the new ideas created by topologic transformations are true, then the nature of the dimensional space created will be truly "intermapped" ie "rotatory" (John von Neumann), and the mind will always open out as a total (toparchic) surface (growth); the relationship between all ideas is intermappedly analogue (n.b., this was not previously known).

(5): {NOTE ADDED: 1996 Nov. ~7:}

¶ If the cerebellum was originally involved with gait (& rebalancing), its recent [illegible] (or toward man) evolutionary rededication to include higher cognitive, and perhaps emotional [illegible] functions, and language in particular, makes exquisite sense — in terms of these ideas about mathematics representing the abstract grouping of (and precise control of) mental energy. ¶ It is e.g. easy to see how this could easily have led to the cultural (& cerebral) evolution of human speech, and the orchestration of [bodily posture, gesture, behavior, action, & education] (and thought about them) that is human conduct (and ethics, laws, religions, government, art, music, logic, science, philosophy) achievement [as expressed in technology]; [economics, industry & commerce] [which are proportionately general or universal value, the {quantification, quantization, geometrization, chronometrization or {precise, intricate, & accelerated, comparative, freely controllable, multilevel, coordinated, parallel, planned, formulaically traded off, reversible, reflexive, commutative, transitive, nonlinear, predictive, graceful, skillful, competitive, etc} clocking, management, hierarchization, standardization, specialization, mechanization, systematization, abstraction, etc> of human {drives, emotions, cares, purposes, needs, goals, effort {work}, cooperation, roles, social interactions, aggressions, would-be or innate pathologies, competition, struggle, dominance rankings, hunting – gathering – providing – acquisitive – housebuilding – territorial – courtship – anticipatory – etc} instincts, habits, etc>]; memory (sic!), intelligence, &c). ¶ Gait involves [rhythmic, repetitive, graceful, coordinated, interdependent, interdependent, systemic, &c] movement. This could have [led or been transformed] in the case of language to [mathematical & counted] [repetition, contraction, permutation, harmonization, &c] ['shapely', rhythmic, melodic, maximally or complexly modulated, 'grouped', standardized, clustered, cadenced, &c] sounds ((& their detection & understanding when listening to speech)).

and words—few give an 'orientive' whole.
2 This might happen if motor emphasis was put on either area ~19 or ~17, away from both.
3 and perhaps for innumerable secondary comparisons.

WHAT IS GOING ON IN POST PRIMARY CORTICES

Pat Gunkel

4 Is there typically an opposition of anterior and posterior cortex that in man is upset by balance?

It is fascinating that if you train yourself to note the instantaneous details usually semiconscious in the act of first seeing a picture, but permissibly conscious, details necessary for the basic identification of the picture (as though its 'class') are remarkably few so that, it follows, details are remarkably powerful, as in fact is evident by a second's thought on the number of combinations into which but a few definite but fairly specific elements, withal of very simple kind, can and do enter into; the only questions are: what are these elementary details and how selective are they (and to what extent do they function by "prediction") and with what rapidity and circumstances did they evolve in the past to be active in the future? What is interesting is the apparent fact that post primary cortices representing convergence can rely on just taking very small and few aspects of a picture (or perhaps in series) to, perhaps, make an array of discrepant predictions from which with equal rapidity an analogous memory of detail comparable to the picture itself may be conscripted so as to give any amount of memory and recognition through direct comparison. One almost wonders whether what makes man isn't some change of emphasis away from the 'dispersed' details of experience represented in primary cortices to the assembly and grouping of these details in later cortices emphasized instead: perhaps it is particularly worthwhile recalling that the size of area 4 has decreased in the absolute whereas area 6 and forward has gone up enormously, which might mean a very critical emphasis on large and whole motor patterns as opposed to details, aided by the development of many direct corticonuclear fibers from area 4 in place of uncontrollable indirect perreticular connexions in the stem and spine, and this is extremely important when it is recalled that frontal cortices anterior to area 4 concern themselves as well with the motor processes of perception, precisely pertaining to the highest processes of perception since it is the machinery of attention that is involved, machinery which serves the ontogenesis of complexity of attention derived from delayed action, correction to novelty, sequencing of concerns for the elaboration of motor processes and the judicious agriculture of affective processes otherwise going their own wild, rapid, disordered, thoughtless, dissipating way. Frontal cortex acquires even greater signifigance for high intelligence in the light of the complex connexions its areas have with the basal ganglia so that eg not only may its emphasis be on large and whole motor and sensorimotor patterns but <u>any</u> emphasis or automaticity residual in area 4 or beyond may be inhibited and directed from area 6 or beyond (eg area 4 might be simultaneously or sequentially inhibited and excited from beyond in order to effect a switching in pattern of execution or to redirect action under the influence of sensory or affective (perfused with pure perceptual) patterns). Another interesting possibility would be if in certain areas, such as those of the higher temporal lobe, trains of stimuli representing convergences could be held temporarily without premature integration, analysis, and/or habituation so that different scans of the eye or spans of time could subsequently be periodically integrated for an even higher form of perception; conceivably one basis for this (whether in area 39, 37, 20, or wherever) could be some abolition or control of reticular mechanisms operating elsewhere in the cortex for quickest and simpler integration, analysis, &/r habituation, say in connexion with the development or substitution of pulvinar connexions notable for pluralism, extreme integration, delay, &c &/r motivation for operation derived from forward or affective regions of the brain, or the like--and of course any such dereticulation or autonomous reticular control, &c may reflect the supposed general aconnectivity or the like of temporal and other areas. In connexion with man's language and its cognitive importance, the interposition of a Wernicke area in the sensory and polysensory flow which would be interconnected with motor areas pertaining to speech and which would have heavy limbic connexions could be overwhelmingly important by directing attention to communication and the large and whole sensovocal or sensothymovocal patterns clearly of such value for the ability and inclination to learn symbols and lead a basically symbolic existence where what is symbolism but perception as action and action as perception, centered?

Thus it may be that through this equivalence and some isolation of the activity as an end in itself--eg through staging a partial takeover of the hippocampus, amygdala, &/r the like--perception and action may come to preempt each other and result in a progressive differentiation of thought so that the situation referred to in the beginning of this article, where eventually few and simple features may suffice to give or mediate high recognition through refined and tested predictive combination, may have as its heart this mechanism and propensity: infant and adult man and chimp's powers and instinct of prolonged, undivided, sufficient, felt, and complicable attention are well known and it requires no leap of mind to suppose that this, whatever its nervous basis, accounts for the relative ability of higher thought.

Assumptions about the roles of prefrontal cortex, based eg on lesions, fit nicely with the previous definition of symbolism: what is "planning" but action as perception (eg involving so many assumptions that percepts are assumed, wholes are assumed and looked elsewhere, &c) and what are planning and "self-control of attention" but perception as action; and what is insight but the ability to see and control the complex differentiations of one's affective processes and their extensions in time, a process the obvious result of an afferentation and efferentation of the cortex with subcortic nuclei whose phases dictate the swings of motivation and ability, the pulses and transformation of pulses of those nuclei, their interaction, competition, complex equilibria, cycles, rhythms, contingencies, extremes, mutual control, pulse structure, and topography?

1 Perception 'as' action: (1) you can do the thing as if (assumptively) you were perceiving it or imaginatively or mnemically, or (2) you can act for the ideal sake of perception.

2 Figural vs operative deficits.

3 Prescind (to abstract by an act of attention: detach for purposes of thought: seperate for consideration).

THE DIFFERENCE BETWEEN CHIMP VS HUMAN BABIES

Pat Gunkel

The obvious difference that a human baby might have to a chimp baby might be, to guess without knowing, in the quality of the human's control over its attentional processes, say apparent as a stronger, more persistent, more intelligent gaze and a correlative suppression over otherwise interferent systems such as motor, emotional, or other sensory processes. Then from whence consciousness and that which we see as attention? From development from simple reactions to stimuli, orienting acts, and stabilities. It may be supposed that sensory cortices are strengthened in their control over themselves or of lower reticular, behavioral, or motor processes, perhaps particularly the highest sensory cortices, or that reticular arousal of these cortices (however this classical notion is done!) is increased or better located in these cortices (as to layer, cell, synapse). Ideas of this kind might be served in various ways. One would be for motor control by these cortices to increase, eg preempting lower distractions or competitions, making action simpler, more exact, more powerful, faster, potentially more complex, more reversible, more correlated with sensory processes, more integrated in all behavior, more experimental (action as perception), more comprehensible, more voluntary, more progressive, more elegant (anticipatory and generalizing), &c; this is exactly what has been the case with the extension of corticofugals into subcortices toward man (have centripetals in/decreased, remained the same?) (do thalamic association nuclei receive more corticofugals than other nuclei?) (more corticofugals to hypothalamus and hippocampus but not mesencephalon? to septum? to lower stem, cord, subthalamus, 'cerebellum', and basal ganglia including the amygdala. midline-periventricular stratum-central gray-some reticula de-emphasized? mammillary and anterior thalamic nucleus turned from lower to cortic control or enlooped? &c)—nothing could be more natural than to suppose that along with the evolution of 'voluntary' or cortic control of the musculature through its nuclei has gone the evolution of voluntary or cortic control over the reticular formation and its nuclear differentiations and so over the mechanisms of arousal, drive, attention, 'instinct', reflex, feeling, and even autonomic-endocrine function (perhaps including the rate of aging or the onset of puberty; apparently including the sexual cycle; the next victory might have been over sleep). As to corticofugal takeover of sensory paths and its raison d'etre, it may be suggested that previously there were lower mechanisms operating these paths and that one function of the corticofugals might simply have been to obviate these unnecessary, rigid, simplistic, and distracting operations, perhaps generally to increase cortic control of the subcortic brain.

IS MAN THE PRODUCT OF AN EVOLUTIONARY SERIALIZATION OF THOUGHT?

Pat Gunkel

Has the progressive evolution of the fovea or the foveal system served the serialization of (at least visual) thought processes, and thereby eg the lineative accentuation of configural assemblages and, reversely, the seperability of parts thereof in free analysis? Simultaneously, the stress could be on larger association cortices wherein peripheral and extraperipheral assemblage could go on concomitant with greater memory and, at once, more analytic memory. It's interesting that a similar stress has gone on in somesthetic (and motor cortex) stress of the hand, fingers, and perhaps eye (! thus frontal eye fields?) and "vocature". This suggests that favored speech sounds and perhaps 43 phonemes have been likewise stressed nervous tissue (which could be especially unique if for the first time such specification occurred in and was relatively confined to higher tissue such as part of the cortex, wherein the specifications could involve and not exclude great variety), effecting serialization and greater abstraction in the audiovocal system. Are these the super numerous areolations that have been suggested to exist in the auditory cortex?

All these changes would hypothetically throw the emphasis on the recombination (or 'structural' perception) of the sensory and motor world, with the substitutive elaboration of memory and specifically memory of alternative frameworks or 'intellectual structures'. Eg the serialization of sounds leads to the sentence and the elongation (and recursive elaboration) of speech (the explicit verbal instructions in man may progressively internalize and etherialize as consecutive patterns of systematizing (eg system-building) thought).

Now it's not only the relative areal allocation but the intensity, diffuseness, mode, efference, other connectivity, total efficacy, specificity, local specificity, &c that are important and which combine multiplicatively and yet about which we know but little.

Thus it may be suggested that the extraordinary development of the motor system in man may have served serialization because of the temporal and linear, in short serial, properties of movement and for the sake of the analysis stressed by the serial offsets in the sensory systems; also, the motor system may have been keeping pace with the new sensory complexity (due to association cortices) and the possibilities for motor complication inherent therein. There may be a greater rapidity of actions in man. The development of direct connexions of the cortex to motoneurons would have given a very useful variability, controllability, and responsivity of movements and a spatial atomization of movements ironically freeing complex movements: the stress here would be on exactly how do movements succeed and seperate from one another for the accomplishment of purposes with minimal means. There is an indication that in man the motor efferents (however direct) take origin from larger areas of the cortex than in previous animals and the implication is that higher areas of the cortex (whose development is delayed and progressive in ontogeny, allowing the superimposition and hierarchization of functions) create in this way progressively complex and "voluntary" action; but it would be particularly noteworthy if in this way focussing and serialization of thought (ie overall mental activity) were to further evolve.

One advantage of serialization could be that there would be a concentration of means (eg on anticipatory singularities) on whatever is occurring; eg limited aspects of a situation could be probed in independent (and contingent) depth and therefore eg experience could be analyzed with extraordinary thoroughness (and "detachment"); this could either lead to or involve an economy of means such that everyone would ontogenize a "toolkit" of progressively refined and choice standard behaviors, standard ideas, standard rules, standard perceptions, &c (which could be internally accomodating). Another tremendous advantage would be that the stress would be thrust on choice of objects, switchings, &c, rather than involuntary submission, so that conscious volition would be stressed and could become humanly intelligent.

Another peculiarity might be that stress would be on what is seen as done and thus on the dynamics of perception so that it might be specifically these dynamics which ontogenically develop, where it may be that human thought is uniquely an active thing. (The active thing would be assertive and initiative thing thereby more than ever before concerned with the expansive control of everything's behavior; eg its expansion would cause it to explore and exhaust the traits of experience, within the ontogenic motor analysis of perception.) Furthermore, certain compressive processes would be at work simplifying and switching series; thus a formulaic coding of the world would occur.

(Obiter. It is conceivable the synchronization or slowing of the EEG could emphasize in consciousness older memory, and desynchronization and speeding of the EEG newer memory, since crudity and age may go together; likewise synchronization or slowing could favor conditioning (the phase of rather seperate memorization as opposed to introduction) by insistence on present patterns and exclusion of any more new (the learning process here envisaged is multiphasic and complex). Thus it is interesting that structures are commonly implicated in causing or mediating EEG slowing and synchrony, and in memory, eg prefrontal cortex, basal ganglia, other cortices, thalamic nuclei, &c.)

It may be suggested that the hippocampal efflux through the fornix and the unique degree of the Papez relooping to the cortex in man serves conditioning in the early baby and child so that man uniquely may be trained to control his own neurotransmitter production, reticular activation and drive direction, basal processes of attention, neocortic control, basal processes of conditioning, &/rc in the sense, perhaps, that the hippocampus (and/or its neocortic inputs) develops switching tendencies, habits, foundations, psychology, philosophy, &c and develops knowledge of how these are (internally or externally—subcortically) effected. Thus some or all of the Papez circuit might become unimportant or less important (or in senses) thereafter, later in life. It is rather interesting that the neocortic inputs phylogenetically increasing into the hippocampus may have served the subsumption of fundamental and yet formerly relatively crude serial switchings mediated by the hippocampus, bringing about a complication of serial processes and/or a more exacting control; also the evolution of other corticofugal connexions with centers involved in drive (bypassing the hippocampus via amygdala, association cortex, prefrontal areas, parahippocampal areas, thalamic nuclei, or whatever) might have served this deprimitivization and complication of serial processes (particularly higher serial processes). Serial thought have been exalted, eg through its circular continuation, if the cortex were given direct and independent control over itself, eg through concomitant retrenchment of relative or absolute descending efference from the mammillary body or any number of (numerously suggested) schemes.

Another cause, effect, and/or concomitant of serialization would be communication and the terrible stress of our civilization (and its mese-en-scenes) on doing things, specifically, systematically pre-serialized operations, including operations involving the rigorous (eg inductive-deductive) combinations of symbols and processes (as in explicit and implicit decision-trees); in communication our bodies have little chance to say much in parallel so instead things are woven around (which process becomes the omnipresent codings of language, ritual, thought, feeling, &c as things are systematically compressed classes of "efficient universals" or overall patterns of convergences into divergences and divergences into convergences, whose only substantiality may in fact be their thorough interdistribution). If men are so designed that they intercondition themselves from birth, stress might have been placed, phylogenetically, on interpersonal communication and thereby on serial thought and, relatedly, cultural preservation, cumulation, and complication. It is possible that whatever mechanism serves parent-child, 'marital', and intraspecific bonds in lower animals was enhanced in the primates toward man in the sense that cortic areas and connexions depending having ir/reciprocal connexions with the subcortic or cortic centers or mechanisms basically embodying such bonds; any such altruism, socialism, or latitude could have given us society and social learning in the higher intellectual senses, such as the learning of language, behavior, & thought.

There are several dimensions in which serialization might increase:

(1) For acceleration of serial thought, perception, action, feeling, &c.
(2) For control over that thought.
(3) For complexification of that thought.
(4) For multiplication of levels of that 'thought'.
(5) For minimization, narrowing, or at least choice over the content of that thought.
(6) For amount, parsimony, abstraction, and power of that thought.
(7) For greater freedom of that thought.
(8) For parallelism of that thought.
(9) For fewer distractions to that thought.
(10) For, not serial nor parallel, but "punctal" analysis of series of that thought (in all possible ways).
(11) For emphasis on assertion and activity vs passivity of thought.
(12) For serial comparison or cooperation of such things as entire pictures of the environment or all across the past lifetime.
(13) For enlargement of memory (fuller, lenthier, permanent).
(14) For spontaneity of thought and association.
(15) For "pit-climbing", "antithesis", and "arachnoidy", or a kind of parallelism of thought perhaps.
(16) For a strengthened consecutive rigor of proximal and distal serial 'points', eg for temporal asymmetry.
(17) For a transcendence of mere spatial and/or temporal seriation by 'higher' (in any case, fuller) qualitative seriation.

* RETYPED ELSEWHERE!

ARE AN INEBRIATED MAN AND AN ANIMAL COMPARABLE INTELLECTUALLY?

Pat Gunkel

I wish to suggest that a drunk and an animal are analogous in intelligence inasmuch as a congenital drunk would never achieve our intelligence if he were as drunk as an animal is dumb (assuming this is pointful). It is perhaps signifigant that eg damage to the thalamic dorsomedial nucleus produces a kind of drunkenness and that there is some indication, however slight, that damage of this kind, if congenital, would produce idiocy. Characteristics of these states are obvious stupidity, amnesia, silliness, confusion, disorientation, deconcentration, defect of purpose, vulgarity, defect of insight, irreality, defect of time sense, impairment of consciousness, visceral changes, &c. Here is what I must report from being drunk: motor incoordination, slowness of thought, muddleheadedness, slowness of perception, lapsing and restriction of perception, a kind of closing and shrinking of the world, autocosm, poorness of memory, inability to use memory, inability to think so systematically, decrease of purpose, childishness, emotional blunting and crudification, a lack of seriousness or care, overgeneralized pleasure (inability to package and direct pleasure, to postpone pleasure and things), simplification of perception, greater illusion, lack of self-control, excessive harmony of things, centering on and yet thinning of the present (loss of the past and future), dissociation of behavior, mental inexactitude or blurredness, loss of curiosity or habituation (shallow curiosity), overconcern with 'simply getting on in the world' (ie orientation, action, reaction, coping), conception yielding to perception or sensation, overcertainty, poor perception of self (deobjectification), glibness, loss of spontaneity, &c. Now these are very interesting properties if they could be dimensionally inverted by changes in nervous systems leading up to man so that their opposites could be extended or maximized. Take just one property. I see a man out in the field opposite who is patently drunk. He is standing in the wind and his shirt is flapping. I see through binoculars that his shirt is sharply detailous. I know perfectly well that in his approximate stupor this sharpness that I see is wasted on this man. But I believe that such an ability to remain aware of sharpness and detail is an essential to the development of higher ideas in a human mind. Ie it seems a trait of man that he is able to sustain and control the processes of his mind. If these are customary processes for the posterior or lower cortices, then higher cortices are able to modulate (eg inhibit, sustain, intensify, pattern, move in time, complicate, direct, compare with reality or themselves, delete, &c) these lower processes; at the level of the lower association cortices it might suffice for the higher cortices to hold in the mind's eye patterns in the lower cortices so that these are progressively compared with, elaborated in, and derived from experience (indeed, this could gradually give the higher cortices an imaginative realm and imaginative life based on what is learnt from comparison of held and seen experiences). It is apparent that the lower cortices customarily go in certain directions and that the effect of higher cortices gaining control over these directions (eg by prefrontal cortex exploratorily suppressing issue of the posterior cortices by arresting, hypothalamic &r other mechanisms of action or reaction) could be transcendentally important. The ability of the higher cortices to intervene in the constant (and perhaps overconstant) processing of the lower could mean that a view of the world and of oneself could be abstracted ("picked") as sufficient and the brain could then concern itself with getting further oriented in and making use of this arrested picture (the difference between a boxing match and a quiet view of a lake, a flicker fusion vs a stopped disc, an external program and an internal program, a rout and a society, a field of flora and a flower in hand, a guess and a mathematical certainty, babble and language, a dream or television show and reality, the chaos and the order of the world).

[illegible] lead to a very different topology.)

? (What is [illegible] is the ability to abstract, [illegible] "wholes". Again, the animal rarely undergoes experience; man is surprised by, criticizes, and uses — even husbands — experience. This freeness [illegible] experience means that man extricates himself from systems of illusion and false and total cohesion of experience; possibly the animal is confined to analysis of immediate i/o past things, whereas man is able to do [illegible] the other and superlatively — eg analyzes things as they are occurring

* (Note the idea of a hierarchy of operations, being able to control one's controls instead of being controlled by them, eg what is more characteristic of man than his "alternation"? Note the difference between simply experiencing an operation & that it occurs — and seeing the operation — how it occurs.)

It is apparent that if such a view of the world can be abstracted it can be added to (and it can be packed in memory). One view can be placed along side another and they can be compared in a leisurely but sharp fashion. It is apparent that the motor cortex would indeed want to have such abstractions because it would hold these in wait for the execution of specific actions or reactions. Only naturally would serial views of the past be alternateable, operable*, seperated, compared, &c for certain wholes? would only be appropriate at certain times. Furthermore, the motor cortex might not wish to release these wholes through entirely, from the beginning, without change, &c so that the cells of frontal cortex would only naturally become concerned with a realm of active thought, with exclusion, purpose, and planning. If a perception could gain control over the active process of perception it could cause inhibition of anything analogous to this mnemic perception so that the seeming rapidity of perception would increase; or holding a percept in mind might cause it to go round and round or to correlate extensively with subsequent experience, so that description would intensify by contrastic omission ad infinitum, and self-identification with all that is definite and clear in that perception.

X

CATOPTROMANCY

Pat Gunkel

self-reflexion

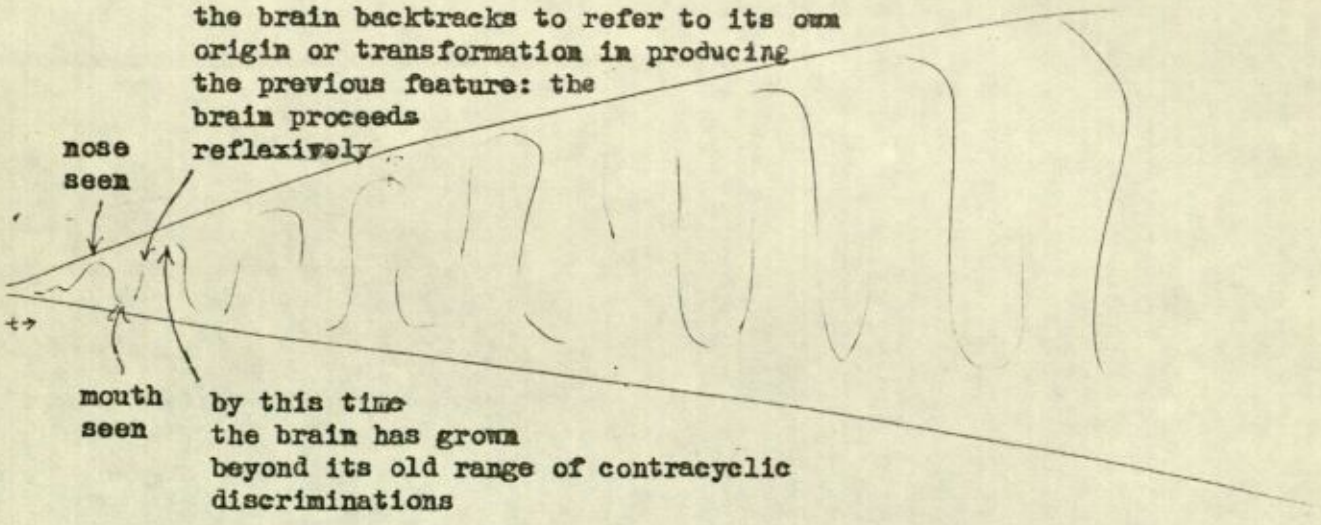
The secret of mental progress (phylogenically and ontogenically) may be to present a picture of self to self. Self confronted with self, or self-confrontation, may lead in a transfigurative fashion to self-asymmetric ("autasymmetric") thought and endlessly-recursive preoccupation with shedding of "surfaces" of the n-dimensional (idiomorphically specific) structure of the mind or an internal or infinitive (apeirophilic) topology. Much in fact suggests this is so—in brain anatomophysiology and in epiphanies in life (the paradoxic oligodynamicism and either-orness of LSD may owe itself to a catalytic chain-reaction when the 2 wholes or 2 topologies meet at but the first 'point'). The Papez circuit, the "idea of ultimate truth" elicited by hippocampal or amygdalar electrostimulation, the encounters with one's self in dreams, in amygdalar stimulation, the superego, angels, indeed the idea of God, (note that the paranoid phenomenon of being stared at from behind by retrosplenial stimulation, near the area prostriata, may refer to the extravisual 360° completion of the visual periphery, suggests an interest in the unseen, suggests an empathic seeing of self (from the rear), is near the interesting precuneus (pathology in which may produce thalamic dorsomedial nucleus-like effects, &c), &c). Creativity, intellectual insight, insight into self, &c may follow those occasions when the 'form of the whole' (which may be "essentialistically" specific—cf my work) may be seen and holotactically compared, say by seeing it <u>as one sees it</u>—note eg the tremendous mental and psychic freedom or power that may come from being independent of one's ideas, from seeing their form instead of obeying strict functions (<u>successes</u> are not the 'things'!).

This seeing of self could have led to a critical functional indeterminacy in homo sapiens, so-called free-will, and explosive thought and mental ontogeny, whereby the whole, like a liberated fountain, would gush over upon itself in an unpredictable orb of spatter; hitherto the mind was fusive—now it is fissive; that would be the great divide seperating man from his animal antecedents.

Man, mirrored, is inspecific (or, self-perceiving, <u>functionally</u> specific), or a mirror mirroring, and thus defining, his 'self'. What is seen looking in a mirror but everything?

A couple of well known ideas are that of the insignifigant event or change whose consequences inevitably fan out and explode throughout the world (so as to prevent "time travel" backward) so as to infinitely <u>and entirely</u> (since the effects radiate extensively and intensively, so as to saturate all possible real changes—how the hell does <u>anything</u> happen, conventionally?—one might extract a determinism from this since it implies the whole universe is a single reciprocal) change the world; and that of meeting with oneself (cf. Fyodor Dostoyevsky's <u>The Double</u>) or, rather, of seeing one's brain in a mirror during surgery in such fashion as to see the origins of one's thoughts or intervene in its bases. Therefore one can imagine that self-confrontation could take the form of not just a fabricated, remembered, or instantaneous general or specific, or divergent or convergent ("paradoxic") homunculus of oneself, but some sort of seeing into the essence of one's mechanics, say the general or detailous layout of one's general or immediate mind, and perhaps with some ability to alter these (you know, one could see oneself at many hierarchic levels); so that one could suggest that man is distinguished by the degree or kind of seeing or being able to see, and alter, himself in these ways, by having sort of an x-ray of himself, and, perhaps, having the paradoxic-explosive effect or situation described above, or a simpler consequence—that man, unlike the animals, displays a self-created character or an artificial, as opposed to natural, character, or where a schematization of self is projected out across the world, or where eg, the ideas take on the nature of being self-describing.

THE BRAIN PROCEEDS IN A SELF-DESCRIPTIVE WAY



(Each wave a modulation of the former. The brain is always proceeding self-descriptively. It is autometric and automorphic.)

A certain resonance frequency corresponding to a shape.

Eg:

A B AB

Another resonant frequency corresponding to another shape.

Third, another (and a progressive yet regularly progressive universe) resonance corresponding to the co-tissual interaction of the multidimensionally (due to 'processing infinity') disparate resonances. Yet, for all this division ad infinitum, the metrics of the original resonances and their shapes is preserved in the condivergence. In this way a unitary spectrum is created, potentially universal for all possible aggregate shapes.

DEFINITION, CERTAINTIES, AND PROBABILISTIC EXERCISES

Pat Gunkel

Imagine that the human mind has a unique ability, or ability to be taught, to inhibit cortic areas or cells from contrary areas or cells, with the effect particularly that percepts, concepts, states, and operations occurrent in cortices may be voluntarily or differentiatively inhibited or suspended by the contrarious areas, cells or whatever. So that, i.a., a division and comparison of mental states is tendential, specifically for such things as a resultant contrast and measure of probabilities of occurrence and form within and between states et al. Not only would a measure of probability appear, however, but a type of mental state, become an attitude, being particular and universal certainty, almost in and becoming the testing of made propositions and the certainty of propositional activity and activities, a challenge to appearance and a struggled experience of the world, as opposed to passive states in disqualifying animals. The particular certainty would have in its character the giving of definitions to things and to the mind integrally, which immediately creates the ranking and rowing of things by the discreteness of combination and the extravagance of combinations (infinite beyond the square of sets) true of our world, where the decisions made by men, forming trees, may be small and particularly small because ruthlessly recursive.

Now I imagine that there may ontogenize out of that a practise of probabilistic exercise such that the mind would voluntarily and exuberantly test probabilities of things, transfer and transform these probabilities, and exercise these probabilistic functions as ends in themselves in infinite internal ramifications; this pure generalization of probability, in fact, might simply be a product of the paradox of equivalence relations (which are irrational, absolute), of catoptromancy, or of a peculiar mechanical lability of the human brain or cultured mind. In this way I can see a polar reduction of everything to asymmetries in chains of numbers, as I have hitherto suggested.

Seeking a merely quantitative difference between men and animals, one might suppose that an ideal ie apparent recognition of a thing as a field or certain field, presented as a scene, might be held before the mind's eye with such comparative tenacity that it carve out a very specific correlation between the probability of events both within the external and internal scenes in themselves. Unusual perseverance of the scene subjectively could cause a specifically heavy and redundant analysis; this could be quasiredundant analysis inasmuch as the scene would be comprehended with variation of new aspects, relatively unlike animals where crude or factual recognition would complete the brain's analysis by switching or suspending attention, or effecting a program (of relatively nonintrospective or extensive, as opposed to intensive, sort).

It is easy to imagine that the progressive ontogeny and phylogeny of the prefrontal tissues would involve a progressive and extreme evolution of second-order thoughts through inhibiting the simplistic positive acts, percepts, and emotions of the lower, posterior cortices and the subcortices, where the specification of the complex form of this progressive, redirective, and catalytic inhibition would exactly be the influx of the acts, percepts, and emotions into the finally-developing cortices in a transcendent reformation there.

The positiveness of identification of particular forms (of whatever) would amplify and elevate their matric intercombination ("transcombination"): forms perceived, things done, and feelings felt would take on a widened, narrowed, deepened, regularized, intensified, and unihierarchic signifigance, and a signifigance which would be contimually tested and "rewind".

AVERAGING BETWEEN ALL DIFFERENT DIMENSIONS

Pat Gunkel

I have suggested that peculiar averages may generalize over a tremendous range of real and possible experience, yet be in themselves of the utmost simplicity as the repeated intersections of the probability, in the sense of having an infinite memory with a finite number of components via cubic sets, and this is the last thing as it was the first thing to come to my mind in looking at the brain. The idea is extensible, for generalization to the utmost degree, when it is considered that the total cosmic activity of the brain, doing nothing so much as embedding probability ad infinitum, is in a supreme position for acquiring and applying an indefinite number of averages over the total sum of its experience. Why are there phylogenic differences in intelligence? It must have to do with the fact that the evolution of mechanisms for conditioning, in effect for wanting intelligence, and for intelligent conduct was tartigrade. The nature of these mechanisms must thus be very carefully considered in conceiving artificial intelligences. Then the other, duller changes in component, organization, and quantity that one sees across phylogeny as man's background, will suddenly come alive and have renewed signifigance as past and future directions over which human and transhuman intelligence and being may yet go. By way of example, there is a volitive difference between man and subhumans easily extrapolable beyond man and even, by perfectly visualizable mechanisms, infinitizable, where the consequences would similarly be infinite. Evidently this exceptional will is quite independent of averaging between all different dimensions, as a variation of personality.

Forgetting momentarily the possible parvitude of component, functional, and logical complexity—sufficient for amazing or human intelligence and, seperately, being—I am increasingly curious about the operations and mechanisms in the brain that allow such computation, embodiment, and expression of probability, both in the dynamic and structural sense, and, in respect for what peculiarities or simplicities they may have, how such power can be synthesized in our own physical creations. For it is conceivable that this is one of but several characteristic simple elements by whose combination nonhumans will be realized, in a fairly direct way (as suggested in the title). There are many types of probability, probability is in itself inspecific, and this is one of the problems that must be considered.

It must be admitted that very few people have considered the subtler, total, and ramified associations that may contribute to the probability of neural behavior, without regard for fantastically supersimplified and select purported "mechanisms" and "phenomena". Yet the force of this observation is so well illustrated by the fact of the multitude of mutually irresolvable schemes that contend in brain literature, so much so that, on altering threshold and seeking certainty, one finds none, but a barren wasteland of dreams.

Or one might say that in the brain there is but a single event, and this is averaged, and this reflects experience.

EMOTIONS, LIMBIC SYSTEM, ETC.

THE FUNCTION OF THE LIMBIC SYSTEM IS CLEAR

Pat Gunkel

It's an inhibitory filter that preferentially resolves anything that arouses conflict, introduces uncertainty, triggers desynchronization by its novelty. In the hippocampus habituation and perseveration occur, the registration of novelty and the institution of its record; the hippocampus maintains its excitation til proper resolution of the problem occurs (indeed, the amygdala is exactly related to discomfort and sleep--the two being antipoles and coupled). The pattern is fed thru the fornix to the mammillary to the anteroventral nucleus to the cingulate; for the cingulate or limbic lobe to succeed in quieting or disirritating the cortex, interfluxal coincidence must occur that produces a practical result which lowers the immediate cause of the activation of the irritative mechanism--eg stable intrinsic desynchrony (of such kind that problems exist for the cortex balanced in terms of a history of irritations and sensory influxes)--so that any pattern able to produce this result, anything even statistically correlated in the occasion, will be that which the cingulate inhibition favors since it's that which is arbitrarily susceptible to the impression of the cortex. Indeed, the dorsal and ventral hippocampus have often been assigned opposite functions of activation and deactivation. It's possible the loop is closed in a Papez fashion or simply via the continuous interposition of the cingulate filter before the susceptible neocortex filtering back into this system its excitations; the cingulate cells may cumulate patterns that last for days, months, and years. Schizophrenia perhaps reflects overaction (and is peculiar to man because of the mammillary route's jump in man), overconductivity, or overexcitability in eg the cingulate by eg some cause of excessive excitation external or internal (by transmitter imbalance, eg hypercholinergic or hyperadrenergic) so that experiences are <over- or under> analyzed or perceptions <persist, interlace, and interfere>. The deleterious consequence of stimulating the hippocampus or thalamic nuclei (eg those giving rise to the eeg) is transparent since this would simply produce meaningless inhibition of the neocortex and <sleep or amnesia>, or meaningless facilitation (this facilitation may then reflect the will in a strange quasi inhibitory guise, for pulses could pass thru with excessive ease but would be less analyzed, which may explain the effect of cholinergics on the brain; this suggests why cingulate stimulation produces its behavioral effects--eg overaction cum poor passive (cat a25) avoidance learning, in which case the effect may be frontal). These effects may however reflect a striatal relationship and, at once, suggest the experimental facts thereof. MII's stereotyped behaviors may be frontal of the voluntary a4 and lateral cortex because a4 is too <direct and trafficy> versus the out-of-the-way MII, and the lateral cortex is less close to the cingulate mouth of the inhibitory train of pattern. Caudate hyperadrenergism of course equals stereotyped behavior and initial facilitated behavior. The raison d'etre of melanin in the striatum and hippocampus, eg, must be to make these cells extraordinarily hyperpolar so that great probabilistic ranges are sampled and coincidental summations must occur for firing.

DICTIONARY OF THE EMOTIONS

Pat Gunkel

Purposes of this dictionary are many. It is the only I know of. What is the spectrum of emotions of what man is capable? How do various lower animals compare? Is man an emotional being and distinquished by his emotional variety, range, subtlety, kind, depth, combination and cooperation, &c? If so, why have these emotions developed? How (arboreally, matrically, seperately) do they develop in ontogeny - at what time, with what correlation, what predecessors, with what variety, with what external and internal events, with what rapidity, with what clustering, with what expansion and configuration, what what consequences, &c? How related and different are emotions? What are their interrelationships in adult life? How many emotions and emotional concepts (and what are all of these?) can, do, and do regularly combine in experience? What are the serial, causal, indirect, and circumstantial relations of emotions? Does emotional life ultimately become a life of associations, memories, ideas, infinite textures, infinitesimal relations, processes, percepts, formalities, syntheses, unified moods, and repeated and yet irrepetitive antiredundant interpatternings? Are the emotions capable of having many origins? Are all or any emotions integral or necessary or which could a being do without and still remain seemingly human? What is the neurophysiology and neuroanatomy (in detail and integrally) of each and every of the emotions? What is the psychologic and neurologic theory of all of the emotions? Could trees, matrices, and nets explaining the emotions have utmost simplicity of parts and functions? What are the dimensions and elements of description of each of these emotions? What are the relationships of the types of order to these emotions? There are many people who say that emotions are what man is all about and so the theoretic challenge is to be able to account for all this humanity in one's theories, mechanisms, and minds. Indeed, it may well be that by an account of these emotions a deep insight will have been struck into the nature of the brain man. It will be noted, indeed, that the list of emotions blends indelibly into feelings, ideas, states, acts, expressions, &c. What is the structure of emotions given by this list? Are the emotions--described, discriminated, discriminable, extant, meaningful--finite, bounded, and configured? It was for all these reasons that I assembled this present dictionary. My source of all definitions was Webster..

shock A sudden or violent disturbance in the mental or emotional faculties; a sense of outrage to one's convictions esp of morality or propriety; something that causes outrage, horror, stupefaction, or disturbance or agitation in an institution, person, or organized system; a state of profound depression of the vital processes of the body characterized by pallor, rapid but weak pulse, rapid and shallow respiration, restlessness, anxiety or mental dullness, nausea or vomiting associated with reduced total blood volume and low blood pressure and subnormal temperature resulting from severe esp crushing injuries, hemorrhage, burns, major surgery, or other causes

surprise The emotion excited by something sudden, unexpected, or contrary to expectation: terror, perplexity, or alarm caused by a sudden attack or calamity; or astonishment, wonder. To strike with wonder or amazement because unexpected or different from what has been anticipated: affect with an emotion (as astonishment, awe, shock, or unexpected pleasure, disgust, or delight) (eg "the morning skies...surprised her daily as if they were uncommon things", "his conduct surprised me") - syn: astonish, astound, amaze, flabbergast

A CRUDE LIST OF EMOTIONS, FEELINGS, AND EXPRESSIONS

Pat Cunkel

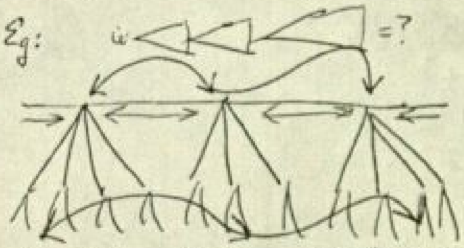
1. shock
2. surprise
3. wonder
4. awe
5. amazement
6. disbelief
7. confoundment
8. perplexity
9. contempt
10. indignation
11. startle
12. doubt
13. curiosity
14. questioning
15. uncertainty
16. mystery
17. displeasure
18. anxiety
19. ill-temper
20. anger
21. fear
22. fright
23. furor
24. rage
25. inanswerability
26. yearning
27. passion
28. love
29. devotion
30. affection
31. fondness
32. charm
33. dullness
34. peace
35. calm
36. ataraxy
37. neutrality
38. timidity
39. bravery
40. courage
41. will
42. zest
43. hopelessness
44. doom
45. happiness
46. cheer
47. delight
48. joy
49. gaiety
50. rapture
51. ecstasy
52. satisfaction

caprice
abandon
whimsy
investigation
mopingness
dopiness
dumbness
stupor
faintness
alertness
suspicion
certainty
confidence
determination
fortitude
enchantment
bewitchment
feeling
apathy
disinterest
zeal
hurry
helplessness
depression
despondency
hope
guilt
worry
sympathy
pity
laughter
mirth
mischievousness
rectitude
dislike
hate
repugnance
malice
spite
jealousy
envy
greed
rapacity
possessiveness
deliberation
reflection
meditation
abstraction
fancy
play
defiance
deference
shyness
modesty
chastity
humility
respect
gratitude
service
servility
obsequity

meanness
badness
infamy
despicability
indecency
immorality
humiliation
defamation
unfairness
righteousness
pomposity
boastfulness
remorse
sorrow
grief
forlornness
regret
repentance
heartache
authority
importance
mission
dignity
melancholy
loneliness
anquish
lassitude
boredom
fatigue
listlessness
horror
terror
tension
fugue
flight
lust
sexual pleasure
instability
fickleness
consummation
emergency
solemnity
ghastliness
sickness
nausea
morbidity
moribundity
expectation
vigilance
watchfulness
caution
care
comfort
insanity
violence
hunger
thirst
success
fraternality

*) What kind of tree (see '68 The Possible System of Mass Classification) characterizes emotional emergence of emotional experience?

Eg:



(at each moment of time an [illegible] sequentially each branched classification of all 'the' emotions is implied, yet these trees serve as each other's [illegible] branch-points! so what is the secondary process over these?)

grace
inspiration
method
vanity
pride
superiority
condescension
intelligence
wisdom
sulkiness
shame
slyness
deceit
tenderness
absurdity
hilarity
merriment
delicacy
negation
affirmation
disgust
admiration
rejection
acceptance
scorn
blame
resentment
ambition
resignation
revenge
vehemence
confusion
pain
suffering
misery
agitation
fanaticism
giddiness
hysteria
disorientation
ignorance
tolerance
warmth
reception
sincerity
honor
duty
responsibility
irreality
bizarreness
grotesquery
grandeur
sublimity
reverence
exuberance
elegaic beauty
nostalgia
loss
triumph
turmoil
brooding
haunting sadness
sweetness

mock-sorrow
bleakness
ruggedness
ferocity
exultation
bitterness
darkness
urgency
serenity
self-pity

OTHER FEELINGS
solidity
falseness
elegance
splendor
pulchritude
deliverance
might
unity
harmony
power
speed
complexity
length
intensity
diversity
abundance
sufficiency
criminality
adience
abience
association
truth
poetry
self-consciousness
growth
irrelevance
incongruity
destiny
freedom
naturality
drama
succession
ingenuousness
candor
honesty
flow
rhythm
drive
extravagance
struggle
assertion
obscurity
composite
'subtle'
indeterminate

BODILY EXPRESSIONS

coughing
sneezing
starting
blushing
'barking'
whining
drawing back the ears
attention
snapping fingers
frowning
gesture-language
kissing
laughter
lipsmacking
perspiration
pupillary changes
screaming
shrugging shoulders
smiling
sneering
snarling
sobbing
spitting
tears
tickling
itching
trembling
weeping
wrinkles
yawning
stretching
opening the mouth in surprise, expectation, horror, anger, &c
gritting & grinding the teeth
grinning
puckering
lips outthrusting
chin upturning
dimpling
winking
lipbiting
whistling
liplicking
lip backfolding
head cradling
head lifting, sinking, tilting, shaking, outthrusting
head-eye interdependence
gasping
expiring
tongue extrusion, contortion
scratching
nose wrinkling
eye lid-lash motion and posture: palpebration
squinting et al
nose rubbing
snorting
nose-thumbing
nose picking
smacking

lip thinness and thickness
position of mouth corners
showing of teeth
extension of teeth or quasibiting
chin extension
ear touching
mouth touching with various fingers and thumb in postures and motions
kneck touching, rubbing, covering, feeling, grasping, compressing; front, side, rear
various forehead arches, uni- and bilateral, motions and postures; simple, complex, combined, and combined with nonforehead and semiforehead cooperations
forehead stretching and heightening
vacuity and stillness
eye side changes
squeezing of eye(s) by various finger tips, sides, knuckles, wrist, forearm, &c
flat-palmary and other smooth rubs, brushes, and exhibitions
various pilar transactions and erection (real or imagined)
various exoteric and esoteric 'complexional' changes
hairline interactions
degree of teeth parting
various asymmetries
various contortions
alterations in the neighborhood of the nose corners
nodes, textures, degrees of freedom, mechanics, manifestations, architecture, attachments, wiring, resolvabilities, media, neural centers, and other characteristics of glandular, muscular, and other effectors any- and everywhere in the body apt to receive energy, communicate without, or involve a mental configuration and thereby participate in total emotional processes discretely or analogicly in whatever manner
by way of example and in particular, these 21 muscles, theoretically subdivisible into strands and groups thereof by various mechanisms: of the scalp--epicranius, occipitofrontalis, temporoparietalis, extrinsic of the ear--auricularis anterior, auricularis superior, auricularis posterior, of the eyelids--levator palpebrae superioris, orbicularis oculi, corrugator, of the nose--procerus, nasalis, depressor septi, of the mouth--levator labii superioris, levator labii superioris alaeque nasi, levator anguli oris, zygomaticus minor, zygomaticus major, risorius, depressor labii inferioris, depressor anguli oris, mentalis, transversus menti, orbicularis oris, buccinator
likewise the very many parts of the vocal apparatus, sensu lato

Now characteristically the various large lists above are readily converted into combinatory matrices of binary, ternary, and higher kind in the identification or recognition of familiar or possible emotional states or more complex series of those states. Just the binary matrix of the emotions and feelings gives something of the order of 60,000 boxes, proving interesting on cursory examination, and the higher and subtler constructions and series wonderfully illuminate that complexity of emotional experience which fluidly derives from such simple bases and which some people falsely harp on as illustrating the unanalyzability of the human mind and which some people forget in assuming the crudity of that mind, its feeling, awareness, and expression. I believe that the textural vastness of matrices of affect, sensa, acts, ideas, &c emplaces one in the heart of poetry and shows one the woods in all their terror and magic, which is to say, I believe that profundity is framed.

The next question becomes how simple the springs of emotion may be, and the task, the description of this chamber and its contents.

THE "BASAL GANGLIA"

Pat Gunkel

It has been my claim throughout this book that the amount that is known about the nervous system is finite and small relative to its redundancy, the mythology, what remains to be found out perhaps, and especially pure hypotheses or abstract possibilities, and that therefore there is a wonderful opportunity for researchers now to undertake the great task of the considerable simplification of the literature and intelligence of this field and its re-presentation under one cover, a project all the easier because of the exploitability and essentiality of common relations and devices such as large and excellent matrices; obviously much of our knowledge or its, often fatal, representation will require overhaul or repetition, but much of this would have been unnecessary only had the proper care and devices been applied originally. Therefore by way of example and in pursuit of the additional goal of this book to systematize knowledge of the entire nervous system I here endeavor to crystallize what is known about a large anatomophysiologic so-called system, the "basal ganglia". It is everywhere stated that we do not know just what is meant by this group or even by this concept, which is an absurd situation with however a sense of deja vu in the neurosciences. Scientists are poets and poets scientists on the sea of their own words! It is not even possible to make this term coextensive with the telencephalic nuclei because some have fallen into sympathy with the inclusion of so-called "centers" in the so-called "gray" of the so-called "mesencephalon". So in the meantime be it stated that another intention of mine here will be to theorically explain the mental operation of this arbitrary territory of the nervous system, so that it need occasion no further worry as a mental system. In some ways the basal ganglia are wholly representative of the rest of neuroscience because it is often stated that they are one of the least understood and truly unknown parts of the nervous system, so our accomplishment in explaining the ganglia will be that much more phenomenal!

DISQUISITION ON THE EMOTIONS

Pat Gunkel

I will take the position that the emotions are not hard to explain, intrinsically or by comparison with other subjects elsewhere considered explained, and that no unusual problem will be presented by the task of their mechanization, such as undertaken in a later part of this book. They will simply be regarded as a rather arbitrary middleplace in a continuum, a continuum described at one end as made up of oversimple reflexes and at another 'end' as apathetically or subtly cerebral, and in the middle as emotional phenomena; however, the result of my presentation should be to permanently expose emotional aspects lying as well at both extremes. One interesting consequence of this and the general presentation may be to prove something of the fact, kind, and degree of emotional life of animals and therefore to transfer some ethical signifigance to these hitherto often devalued species; the Schweitzerian reverence for life is doubtless multitoned, but the intrinsic importance of lesser, alien, defenceless, or mute 'animals' is one motive—I would like to produce a universal aesthetic calculus based on neural capacity, the value of which will be immeasurable when the questions of machine signifigance publicly arise, but is great in the currently dawning debate about large-brained species other than man.

I can and will take my analysis of the emotions in two directions: from the most elementary and nonemotional up, and from the highest down and across. The latter will be done by analysis of the items in " A Crude List of Emotions, Feelings, and Expressions". In the case of the first item, "shock", it is immediately apparent the analysis may be done in many ways and degrees and much will be omitted, in part because of uncertainty in realms of explanation and because the word itself has not a few meanings, eg crisic, electric, sensory, and affective, partially unifiable. One explanation may simply invite another superordinate or subordinate one, and all may be metaphors. Further, these explanations will verge on mythology. Eg the electric and chemic single and complex state of all the parts of the brain and body on and off various states of shock should be reliably investigated and defined, and within or from this some configuration may be dynamically decisive or produce an overall explanation (with/out) various predictive powers. This confusion may or may not be peculiar to our first choice, in the relative complexity of emotions. In the future there will be great danger that explanations of neural and nonneural phenomena will be prematurely exalted or regarded as definitive, in the presence of explanatory adequacy and versatility including great predictive power, but withal be anywhere from totally right to wrong to irrelevant in many ways, discussed elsewhere in this book. Shock may be an extremity of surprise, with autonomic and psychological consequences, a certain class of surprises, a prediction of long duration, and distinguished from surprise in particular by concomitant displeasure, disorganization, confusion, horror, abruptness, incapacitation, hopelessness, novelty of surprise in shock, pain, emotional conversion, demand or challenge to action, violence, stupefaction, outrage, abulia, agitation, mental narrowing, &c. Various mechanisms, assumptions, materials, expectations, needs, equilibria, courses, &c in hierarchies, characterize the mind and brain and may be shocked. Consciousness is unified and consequently reactions are universal. Correction, experience, and charge in various systems and levels may take otherwise incapacitated or incapable states by substitution. What is fear, disgust, peace, sleep, pain, the real basis of motivation, sublimation, unconsciousness, mental blockage, conduct, &c?

the nervous system
Just as associates, generates, complicates, diversifies, and extends 'pleasure', &c in its higher and lower tissues, the 'negative' emotions and various congenerous 'instincts' and 'reflexes' and 'experiences' have a similar fate; therefore, eg, pain and sleep and attendant bodily reactions will in facets and nuances radiate, repeat, and transfigure throughout the nervous system and variously cluster or carry their original 'associations' so that eg pleasure and pain may counterbalance, but, purely positively, pain may acquire cognitive intricacy and subtlety, nevertheless eg preserving critical minima, cycles, holistic systems, inversions, &c so that eg insults producing shock may for the most obscure or irrelevant reasons result from all manner of things; perhaps with some sort of displacement of earlier causes and even effects of shock; &c. Moreover, even otherwise, the higher tissues, causes, and effects may 'totter' on the unchanged lower mechanisms and substrates, follow their schedule or stoichiometry or example, even compete therewith, &c in a conductivity of shock. Variously may these facts have been prosurvival. Whether or not shock serves various purposes, the conditions may be effects, and some of the purposes and effects may be surmised; certainly we are all familiar with the relaxation, awareness, vigilance, differences in feeling, thought, and behavior, transcendence, sanity, &c following from and even dependent on shocks. The intricate, holistic, consecutive, &c nature of thought, emotion, and nervous arrangements are obviously things that may undergo and even necessitate and cause analogies to shock. The nervous system may function in any, some, or all of the following ways and they are susceptible, &c to shock: having (i) a 'storylike' pattern of behavior for the lifetime, (ii) many stories (however spaced) per lifetime, (iii) a mixture of the story and learning, (iv) "ambiguous stories", (v) stories with beginnings, middles, and/or endings, (vi) lots of triggers and effects, (vii) constriction thereof, (viii) one 'pecking order' in the structures, &c, (ix) many pecking orders therein, (x) various constellations in the structures, &c, (xi) one, variously modulable, constellation therein, (xii) ir/reversibly empirogenic constellations and/or pecking orders, (xiii) prototypal, alphabetic, and/or 'abstract' themes, criteria, styles, requirements, limens, limits, &c in various ways, degrees, representations, &c for general or specific things, (xiv) interferences, backgrounds, texture, technical characteristics, &c for the various things and structures, (xv) various 'dimensions' of sequences or 'kaleidoscopic ledges', (xvi) various clocks, rates, directions, cycles, momenta, scarcities, ontogenies, idiosyncrasies, rhythms, multivalences, &c in structures, (xvii) mutual constructions in structures and things, (xviii) degrees and kinds of knowledges and ignorances of the environment innately, (xix) various cognitive complexities, (xx) 'hill(s)', 'capacities', 'fragilities', 'deaths', 'illnesses', 'perversions', (xxi) various mutual controls, (xxii) various indifferent choices, (xxiii) various pure or impure nonconservative or conservative economies, (xxiv) various variously innate textures, averages, &c, (xxv) exhaustions, harmonies, and interactions of ideas for extrinsic and intrinsic causes, (xxvi) whatever else. (The nervous system will be explained upon their full account, which may be massive or relatively simple, with skewing of the items and their examples.) These 26 categories should be defined, qualified, distinquished, exemplified, subdivided, edited, interrelated, neurologized, used elsewhere, unified, related to everything else, researched, publicized, quantified, extremized, &c; they are of arch importance in neuroscience; they should be referred to throughout consideration of the lists of emotions, reflexes, actions, orders, hodography, &c.

① : N.b. This 26-item list is given elsewhere in [illegible] & there titled "Possible Neural Substrates of Behavior".

{OBVIOUSLY UNFINISHED (E.g. only "shock" was treated)}

intensity (as flickering candlelight) so that predictions, hallucinations (ie things persistent &/or whole?), and associations are elicited, spun, developed, &c eg in prediction; one might even (page bottom)

INCANDESCENCE

Pat Gunkel

Could information be amplified and how intense could it be? Yes, and it could be arbitrarily intense, the hippocampus as a beacon for the rest of the brain (consciousness); assume the information becomes definite here, then it could be arbitrarily amplified--everyone has forgotten this idea of brilliance; such brilliant information could then force recorrelation or memorization across the brain, including the coordination of behavior.

By this notelet I first conceived the idea of what I have decided to call "incandescence". The specifications and implications of this concept are not yet clear to me but it is possible it is of extreme importance in the development and functioning of the human mind. How does it differ from the activity and effects of the reticular formations? A proper answer to this question might require knowledge of the exact mechanism of the hippocampal system, especially as it is very easy to think of all sorts of modi operandi therefor that sofar, with our present ignorance, are equivalent and even undiscriminated by the ambiguous and partial data that there is. But it is possible that the nervous system has pursued a mechanism that replaces or supplementarily or complementarily surpasses the unorganized medial lower reticula and related parts of the brain, in other words, that the functions usually assigned the latter are not in fact incompatible with stronger organization or transformation of the tissue; by way of example, a parcellation and heterogenization of influence might prove valuable in a pluralization, multiplication, diversification, isolation, and/or increased competition of cerebral activity, or otherwise there may have been the evolution of mechanisms representing novel compromises or activities such as a collection of thalamic cells with wide, coextensive, and yet individualized afferent, efferent, and controlled fields, perhaps with some absence, presence, or specialty of intranuclear connexions, or perhaps in this way reticular relations might be made less direct; it is of course possible that something of the reverse has happened or also, and say the cortex has removed control over the reticula from subcortices or from the reticula themselves, meanwhile exploiting equally or all the more, but in this case a role for the hippocampus might be envisaged. However it may be, these speculations take me adrift from a simple explanation of incandescence.

What has been forgotten in neuroscience is the matter of amplitude in intrinsic messages and controls of the brain. It is fine and good to recall the wonderful fact that the brain can depend on and employ really minimal and qualitative messages to effect even the largest reactions, but this is not incompatible with or underivable from activities of large amplitude, mass, density, urgency, and 'importance'. Likewise wrong is the fear that such activities are probably or necessarily destructive and unnecessary in terms of information or in the service of certain purposes. It is extremely odd how the original development of longterm memory in man would seem dependent on the arcane activities of the hippocampus to the degree of anterograde amnesia being an inevitable result of human bihippocampectomy.and it easy to imagine that the hippocampus normally generates longterm memory by acting as some sort of amplifier, smearer of time, or source of activation in the absolute or equilibrated trigger and/or maximization of recordant proteosynthesis, membranous deliquescence, material relocation or deposition, cellular destorage, hypermetabolism, cellular interfluence, intermittence, colluctation, cumulative catalytic ionization, dedifferentiation, 'cytokinesis', &c. Intensity is obviously a very important subjective and objective phenomenon in the brain and yet one without real study (obiter, which applies for all quantitative ranges in the nervous system). Indeed, some views would have the brain a

(from page top) imagine the alternation (degree, rate, instant) tied to the (eg degree of) elicitation or the like.

2 Hippocampectomics are fully 'conscious'; how are

mnemic and functional n-dimensional or myriodimensional continuum, in which case the difference between anythings or virtually anythings could be nondiscrete and a matter of degree or wholly intensity, and, as in the huge ranges that are peculiar to temporal lobe phenomena, deja vu might represent the capability for this area to heavily or 'fully' associate and find identity between any stimulus or idea and all of memory or of mental possibility, speaking effectively. Thus isolation, amplification, infinitization, and arbitrary fit or combination, inter alia, could be the function or capability of this tissue.

It is possible amplification could occur to traces regardless of their form or origin, or that the amplification would be compatible with the traces provided they had once adapted or come up to it or provided they had originated with the amplification or the amplitude was normal for this activity. The activity of the brain may of course in this sense be divided or specialized and say the hippocampus may have the power through its 'intensity' or whatever to somehow manipulate the information or state of the rest of the brain. It is of interest to suggest mechanisms by which the hippocampus could amplify most or any of the so-called traces of the brain or say something of the nature of consciousness and attention or volition. Circulation, isolation, 'installation', protection, hierarchization, &c all come to mind. An attachment being pursued may take to a hill and gain clinal superiority. It may be especially hard and long to 'take' the hippocampus but then or thereafter strengthening. The hippocampal engrams may be especially indifferent to enticements from anywhere on the cortex or below in the subcortices because of filtering or energic or mechanical prepotency. A circulatory path may be so arranged or so well prepared that it is easier to follow the well-worn tread than to stand still or immobility may insure local suppression, for a kind of perpetual motion machine, or say reticular activation may pump the cyclodromy at aristocratic velocity; moreover, the natural circulation of winds may have scoured the canyon into an informed pattern whose equilibrium may be repetition. In a hippocampal sanctuary crystals might form by a process of purification or enabled ordering; hippocampal ideas might go their directions or direct the cortex with impunity. The hippocampus may be an inescapable turnstile for giving a sense and measure of unidirectional time and causality which might through, paradoxically, processes like Jean Piaget's co-seriation, lead to reversible mental operations and the genesis of higher dimensions of thought and behavior including the immutable hierarchy or orthogonal disjunction of thought and the nonintuitive concept of time. An internally regulated gate could give ultrastability or universal progressive homeostasis. Referring to the above, in effect motor processes using or impinged on by the Papez-Pandya circuitry could in the beginning be fixed, simple, or regular but in any event constant currents or cyclic associations becoming modified by internal evolution and external modulation so that all behavior or ideas would follow from cyclic atoms, a cyclic algebra, and a basic commotion. This, and the other possibilities such as privileged drives or emotions, could king purpose or insure a teleologic and transcendent mind. Other hippocampal functions or mechanisms could include "juggling", "catalysis", "balancing", "'fitting'-sharpening", "matching", "dissolving", "evolving", "queuing", &c. Indeed it is not without signifigance that the hippocampus, likewise other parts of the brain, may do many or the lot of these and other things in common, whereupon the interesting discussion might be how and why this is achieved, how the things cooriginate, how the tasks would otherwise be performed, how the activities are arranged in time and space, what the capacities of the activities are, what the consequent abilities are, what other structures are involved in the various activities, &c.

SEE BELOW

+ ciregesis is rigosis

Class: Controlled overlaps & ideas.

Juggling. Many things can be done at once if not less, many very complicated things--examples remain to be provided--can be performed only simultaneously or can not be analyzed, or at least these things hold quantitatively. The hippocampus might be a site where many possibilities are simultaneously actively or passively handled and coordinated, where all the various parts of the brain might converge and be coordinated, eg in terms of activation, circulation, or conversion of subcortic activity (certain multistructural-multifunctional activities or relationships might be of such subtle kind that the development of a very ingenious hierarchy, series, or complex of states or of an integrative structure with various possibilities of state--a "state space"--would require such juggling or hippocampi might be necessary or explanatory). This term might also have suggested to me metric fitting, time-spreading for fit, moving so fast as to control possibilities only by brief touch or by approximations, averages, &c. If indeed such things as funneling and immolation occur here, then the intense and progressive proximity, integrocorrelation, and degrees of freedom may have made for some interesting types of juggling.

"Look out". Sees rest of brain from afar or on high.

Balancing. If a wedge is exactly upended on a wedge, with their edges meeting at infinity, one has an extraordinarily sensitive instrument for detecting lateral vibration. It occurs to me that the brain and hippocampus might deploy something, perhaps dynamically, analogous. Certain very important or useful information or states might come out of such infinitive balancings or equilibria, however attainable. At the very least, some very exact classificatory system, some extremely fast or pluripotent (including conscious) noobehavioral system, some extreme condensation of the requirements of processing, some extremely dense mnemic textures, some very high vertical hierarchies, some excellent homeostat, some plenipotent unconscious acting in emergencies, or the like. Truly an example of mental mechanics!

Catalysis. A protected, empowered, &c hippocampus might trigger developments in the rest of the brain with power and impunity, eg for objectivity.

Fitting-sharpening. In order for information, &c to get through (eg the hippocampus) it may have to be just right, which could shape the flow of experience and its representation into a particular, eg narrowly similar, form. There is no necessity that the criteria exist in the beginning or end with any information attached to them, they could be a simple lanquage or even simpler uniform teeth, but the criteria could well evolve, even through such a mechanism at first or always, and then possess the mechanism. The fitting and sharpening could be in terms of the order within the influx or in terms of certain behavioral modulations of experience. Sharpened possibilities could then be fitted to each other, and mutually fitting information could then facilitate mental activities or lead to the specific development of certain activities. (Obiter, internal ideas could of course be fitted to and sharpened by the real descriptions of experience.)

Matching. Certain ideas might be held and matched with appropriate or identical ideas, instantaneously or eventually, or the hippocampus might match partial or whole settings in the memory with experience, eg in orientation.

Dissolving. Fluctuatingly ambiguate or oversimplify for imagination; the hippocampus might be a variable lens or lens assembly operating in various ways.

Evolving. Darwinian evolution in miniature, say with the hippocampus et al maintaining or maximizing some survival or other competitive activity of new and old memory or experience for some degree and kind of selective development of things or wholes. Single or few things might be evolved or in the hippocampus et al untold millions of things might be kept in temporary or permanent evolution; one of the things might be the structure of consciousness or personality.

Queuing. Things may not get through, into, &c the hippocampus, &c until problems are solved, &c, so they may polarly back up to the entries (eg of the neocortex) r/& exits of the brain as a purposive hierarchy of solutions. This could of course give a funny character to the hippocampus and the entire brain, an 'orientation', &c. A static queue may accumulate across the lifetime.

If information literally circulated around and reverberated in the hippocampus with unusual intensity, longevity, isolation, confirmation, power, &c so that it became hardened in or the very structure and function of the tissue, say extremely immolated (and immolatively protected form), especially to the extent of an 'imbalanced' bias of the tissue, then the door might be opened to simple amplification and extremization of information, instructions, &c in all the ways of amplification (density, amplitude, synchrony, cross-spectral synchrony ie "suffusion", massivity, urgency, 'importance', distillation, criticality, potential synchronability, analysis for order and registration by the tissue ie "absorption", &c). 11+

Another idea would be that of a "capital streamer" or a product and/or inhabitant of say the hippocampus that decided the entry (eg character, structure, arbitrary organization, self-reinforcing or consciousness-reinforcing organization, time, schedule, degree, collocation, &c) of information then streaming back into the vault of memory to become the 'picture of the mind', a possibility that might be opened by the funneling, immolation, juggling, &c that would have to exist in the hippocampus. It is fun to imagine the consequence of there being an important image of the mind coexisting with the mind where the two might be in competition with each other, one to escape and the other to mirror the escaper or, in effect, to place a mirror in his path, this being the description of consciousness or evolving mind. "Fugue"

These various ideas on hippocampal and/or general mental function obviously are a bit raw and imperfect in concept and expression, not to mention application, but I thought it better to encapsulate them in some form before they evanesced into the eternity of our ignorance about such function. Despite every effort to recall and define the set of ideas, my explanations may have impapyrated entire aliens.

ORGANIZATION OF PREFRONTAL CORTEX

Pat Gunkel

It is said that orbitofrontal fibers interconnect the posterior part of the orbital gyri with the dorsolateral regions of the frontal lobe. Could there be an unusual consequence of a remote region converging higher muscular patterns? Ordinarily cortices are specially given over to private muscles. Traffic in ordinary regions may disturb the tendencies of tissues. Pluralism of such seperate muscular regions could critically divide the attentive focus of the organism and certain parts of his brain (it is notorious that attention can only be given to one thing or the degradation is enormous and decisive), unlike an area where all muscles (and perhaps some or all other mental concerns) are united. So ordinarily the concern of the organism would be limited to and confined within his individual muscles, their actions, and other divisive foci; whereas, in such an area as we contemplate, the organism would have integral and holistic concerns as his extra or chief center of attention: in one sense, he would be concerned with himself. Formerly such fusion might have taken place on the cingulate racecourse, final hippocampus, or precentral comb; which is to say, some or all of the attention of the organism might have been largely centered on instantaneous reactions. It is possible, for several reasons, that the hippocampal and adjoint temporal cortices did involve temporal extension, but merely for cumulative but not productive memory or, again, for the sake of appropriate release in time of things perceived but not thought about (but the inverse may hold, stressing instead the frontal cortex, or both cortices may do these things). The reader will recall my mention of possible "transistential rotations", or a "perceptual-conceptual curve".

Some very simple and subtle things may operate here. In human groups a phenomenon is typical: one person or idea takes over and dominates. A similar phenomenon occurs in physics. In the brain a "critical extremism" may be the rule: in the midst of delicacy, one represented concern may commit the tissue profoundly, permanently, exclusively, centrifugally and centripetally, monochromatically, linearly, &c to it, and only for delicacy of representation will diversity, growth, synergy, synthesis, transcendentalism, and the other antinomies flourish or even really show themselves. On a second point you must show subtlety and a love for the simple. The combinations of different muscles will be peculiar since the meaningful patterns of complex and varying muscles (and other ingredient concerns), which will no longer be atomic but instead the 'complete picture' owing to their merger, are very new stuff: in effect the tissue will have taken on multiple and cooperative (and have destroyed individualism as the simpler) functions as what its life is all about. An elementary example of this would be to unite antagonistic muscles in their closeness of spatial and functional representation; by the way, would it be of value to thereafter or simultaneously (in ontogeny) de-emphasize collateral and perhaps precedent divided regions?

It is of course also noteworthy that the like of orbitofrontal connexions could deliver this holism and delicacy specifically in terms of affects blent with actions, liberated in their own remote tissue; or perhaps more important, the muscular union would occur at the same point as the affective reciprocation so that there would be a triadal unition. Too, Wendell J. S. Krieg has assigned a parasympathetic to area 11 and a sympathetic role to area 12; whatever the case may be, signal and motivational heterogeneity prefrontally is well-known; thus in the prefrontal area a delicate and holistic unition may include elaboration of enantiothymic transactions. More, I have pointed to the fact that in various kinds and degrees of convergence there may be the very origin of divergent heterogeneity and complexity or the emergence of tertiary or wholly novel things. One might surmise that an uncinate, cingular, Pandya, subcortic, &c path has, toward man, especially directed hippocampal attention and memory to actions, purposes, feelings, and whatever else is the happiness of the prefrontal region.

FURTHER SPECULATIONS ON HUMAN MOTIVATION

Pat Gunkel

The question may be asked what are all and especially the higher behaviors that higher animals and especially man exhibit? Possibly there is a mechanism the description of whose effects may be that learning is concentrated on what is most progressive because the action of the mechanism is to narrowly select as much and massively exclude, or anyway grade, all other thoughts and impressions. Again, of this learnable type, there may be a mechanism whereby the animal may learn to control its own level of arousal and own reactions so that a progressive concentration of attention or cerebral activity on the highest intellectual possibilities occurs over time. If true, just why is the human infant so slow to learn and especially so vulnerable, vis-a-vis other animals--is this because at this point or across life mechanisms formerly serving automatic, full, stereotyped, and inflexible psychological (neurological and behavioral) reaction have been damped down, turned off, modified, made unreliable, and so forth, so that these do not retard, distract, or precondition the free, versatile, full, comprehensive, empirical, cultural, and cultural-psychological development of the child's mind? It would obviously be of great interest to know to what degree cultural and social interaction is necessary for the foundation, as well as expression, of human intellectual capacity, in the sense of motivational entrainment yielding the "spirit". It just does not occur in nature that one finds cognition divorced from motivated development and finally motivated orientation.

It may be that a considerable portion of man's brain and its energy is, in man, devoted to the active memorization of large contents of experience; that is, in a sense cathexis has swung from the simpler more direct expressions of emotion and concern that we see below man to the mere content of data of experience, producing, maybe only naturally, shifting and eventual focus on least variant transformations of data (what we would call highest conceptuality) as the source of directions in one's life and the embodiment of the psyche. This extreme emphasis on memorization would not satisfactorily show itself in any obvious preoccupation with the past, effort at memorization, preference for commonplace data, excessive cerebralism, or the like because the effect of the higher invariants would be to seemingly make all of experience interesting, to give intuitive abstraction, and to produce a rapid growth and transformation of attention for an accrual of a sort of increased deconcentration and general indifference; therefore the development and fact would be nicely hidden, effortless, and 'normal'. It may be that below man the cortex or brain is more entrained by immediate, obvious, lower, emotional, monotonous, &c things compared to man, that the brain is organized more in terms of immediate 'flow-through', that the directions and activations of the higher brain are instead strictly dictated by the lower, that at least the intervention of the lower is sufficiently often and/or powerful that the higher brain never becomes self-centered and capable of abstract self-transformations or transformations without an obtuse point, and that in man the higher brain is more fully and continuously active and more divorced from lowerlevel activities (possibly in man's cortex or brain there appear relatively lower eg-cortices that are able to handle routine but once-central duties and free the relatively higher brain to its own thoughts: so man may be unique in possessing a two-level brain in this sense (one is perplexingly reminded of the great growth of supplementary motor and sensory areas in man giving "associated actions" (and 'associated sensory patterns' (=?)?)--may these serve automatic or nonautomatic patterns--such as Wilder Penfield's cinemic memories?)).①

①: Could there be in man a similar cortical area concerned, not with "associated actions" (or even "associated sensory patterns"), but rather with "associated emotions" (and/or with "complex [& perhaps later emergent] patterns of emotional inhibition"; e.g. - with [time-retarded or slowest-changing, accumulative] emotional [gestalts, or sculpture, cenogen-lands, hierarchy(s), etc.]?!

THE WAYS IN WHICH THE NERVOUS SYSTEM MAY FUNCTION

Pat Gunkel

I am a permanent combatant of notions that there are necessarily or even probably overly complex and overly specific nervous mechanisms and behaviors that are inherited. I think that great beauty and attraction could be found in an abundance of such mechanisms and behaviors, and I do not dismiss their possible existence, extent, and essentiality. But I think for the moment at least it is better and interesting to oppose such things in invertebrates, vertebrates, and man as unnecessary and perhaps deceptive. My view is that of course in all these animals extreme inheritances exist in some degree and extreme degrees in some mechanisms, and maybe, say in most invertebrates, the capacity of these nervous systems would be lowly indeed were they suddenly to be without inherited mechanisms, but that in animals approaching man and especially in the case of man there is and will be a tendency for the introduction of supposed (perhaps incorrect) mechanisms that are nothing but a hindrance to explanation and misleading, in turning attention from the power of simpler mechanisms, anatomophysiologic homogeneities and universalities, environment in a broad sense, and generally what might be called noninheritance. I find that in cases where ethologists have succeeded in demonstrating some interesting inheritance of behavior that it is not really clear whether the explanation may be nonneural or, more importantly, there may be some relatively simple and indirect neural or neuroenvironmental mechanism adequate for explaining that particular piece, sequence, or structure of behavior and neural function or the larger and interspecific pattern within which this fits or from which it may be derived. Eg there is no reason for supposing that mechanisms of behavior must differ very essentially or even essentially over any and all animals. Eg there is no reason for supposing that the genotypic or phenotypic statement of the basis or peculiarity of the neurobehavior or psychobehavior is of an elaborate, detailed, complete, and holistic kind as opposed to some of the tendential, alphabetic, indicative, fragmentary, partial, directive, &c kinds that I suggest below; yet everyday ethologists and neurologists--even in this behavioristic, formalistic, and linearistic age--are found with contrary explicit and implicit assumptions and a willingness to believe that great inheritance, and perhaps specification and determination, is responsible. On the other hand it is entirely conceivable that in cases such mechanisms act to <u>limit, specify, &c</u> comparatively uninherited specificities and universalities of nervous and social function. In any case, I will discuss possibilities for such inheritance and even possibilities going beyond what the above adherents likely believe and even ultimate: there is a chance that this is what exists.

[margin note: see *Websters*, sense 2a(2), "wisdom"]

The point is illustrated ancipitally by the fact that the types of order may act, generally or by few, to create great complexity and/or specificity of expression and function by very limited means to create specious diversity.

(1) <u>a 'storylike' pattern of behavior for the lifetime</u>. Using the types of order--such as rhythm, covariance, antagonism, concrescence, spectry, homocentry, gonohomy, isopory, roughness/randomness, precision, degrees of freedom, anisotemporality, variation/creation, contexture--we can immediately see how this could come about. <u>Websters</u> alludes to the following things under story: historical record, tale, detailed account of the career of a particular individual or of the sequential facts in a given case, events taken together, background information that clarifies a situation or affair, according to a time relationship, intrigue, a narrative thread, dramatic values are emphasized, a connected narrative. It is obvious that my meaning is that, to various degrees, the life would be laid out in advance for the animal; he would go and act out a play that was written before he was born, regardless

[margin note: It could be argued that all of the things should come before anything and specific]

of whether this would be in accord with his conspecifics or fellows or in some degree idiosyncratic. It can therefore be conceived, and it often seems to be by some scientists, that all animals or all conspecifics would be or behave the same way and would be essentially multiplications of each other--so that the consequence, of all things, could be that behavior and/or function would be universal because of the specificity and complexity of heredity! At the other intracategorial extreme, of course, this story could only exert itself to some degree, possibly, and in the concomitance of other classes of behavior and function below. Naturally the question--for research--arises to what things the story would be attached, within the body, nervous system, world, time, and parts, qualities, and aspects thereof. And in a certain sense one could see this category having synonymy with those below. The story could certainly concern the set of drives, their places and modes of fulfilment, and the themes which would be behind their arrival and the animal's solution of them on like or unlike occasions. The content which we would consider important as the theme(s) and/or plots(s) could certainly be all or that especially which is dramatic or dramatized in the execution or idealization of behavior. And here we have touched on an important point since some rigid and variously incorrigible scheme or pattern of behavior, that qualifies as a story, could underly overt differences in occasional behavior and withal be rigid and consistent thereunder and ultimately exerting certain equilibrial effects so that the average or general idea of the animal's life, episodes thereof, or &c could perfectly accord with the story's inheritance. Then, too, of course, any such story may be variously suspendable in the regulation and variegation of the animal's behavior and in the potentiality of the organism or the mind to do partly or wholly without it. The extreme or even typical idea behind the story, as a category, may actually be that even the ideas and general, specific, or total imagery of the animal--and/or the like--may be but a manifestation of inheritant specification, as if the whole thing occurred as if some idea in God's mind, or the world itself consisted in a story. Again, many people--perhaps the animists--are quite given to or taken by something much like this, and I even admit in a sentimental way that the idea--like that of God--appeals to me. As a restatement, don't forget that the below categories may actually be the texture or what the story is all about. The 'story' may be limited to the personality, &c but here we go below.

(2) many stories (however spaced) per lifetime. This is as much as stated in the previous paragraph and is certainly contextually obvious as the plural of a singular, whatever the differences eg in nervous organization. These stories may appear at regular or irregular intervals of various kinds (eg instantaneous, comparatively small, comparatively large, identical and the proximal stories, always identical, very large, randomly varying, regularly changing, perhaps regularly 'creasing). They may occur once or repeatedly, only after a sequence or in/complete set or their set or sequence or whenever, twice through innumerably, potentially or actually. Such sequences and sets may themselves comprise simple or "ambiguous" (see below) stories, &c. Stories of this kind may be substories of category "1". Stories may comprise a store that randomly, regularly, or triggeredly run out. Or the running out, triggering, &c may fabricate a bunch of stories into stories or a story. That said, from such stories (which may be variously essentially complete and implicit) the typical lifetime may synthesize its own fabric of stories, which may bear varying degrees of resemblance to anything we would call a story. There is of course the hint that between different organisms--for the reasons given in "2" and "1"--unique stories may differ. (It may be mentioned, in general, that there could be a typical or instantial tendency of a reversal or negation of some story or a "contrastory".) One of the most fascinating questions or inquiries is how do [illegible] encode and process "stories", eg the systematic explanation and classification of stories, and of responses according to stories, could constitute the ~~[illegible]~~ category of phylogeny of intelligence, and the basis for its [illegible] extrapolation.

(3) a mixture of the story and learning. This is stated above, but the hypothesizable elements of a story may be listed and deemed seperate: plot (Websters: the plan or pattern of events or the main story comprising the gradual unfolding of a causally connected series of motivated incidents: narrative structure), theme (subject, topic, proposition, idea, ideal, or orienting principle that is dominant or persistent), imagery, means, structure, causes, effects. All these may obtain in various senses themselves independent and variable. The story and learning may demand, modify, exclude, extend, and include one another: with the above diversity! They may be indifferent to one another. Proportions may vary extremally: a bit of a story possible with overwhelming, seperate, and indifferent learning; superficial dressing of stories by a little learning. What may be learned is the content or form of the stories. What may be told is the content of experience. Stories may exert a kind of elastic effect on learning so that its evolution appears erratic, staged, deliberate, &c, since after a time the story may be disengaged (and, at some point, start over). Learning, behavior, and experience may be independent of the other with respect to the story, to some story, to some degree, to some way, and this itself may give that (highly ambiguous) complexity erratically noted by the ethologist on field trips or at home. Obviously this large range and complex of possibilities is qualitatively inexhausted and quantitatively unmeasured, and without this having been done the essential structure of behavior is neither clear nor apparent and we are in the stars when we contemplate neural mechanisms, eg inherent.

(4) "ambiguous stories". This is in part given above but I have something additional in mind. First of all, we have not here nor has anyone elsewhere exactly defined a story, in their sense or mine. There is something very odd about the concept. One is occasionally prompted to think that all stories, are essentially, ambiguous, or, to put that another way, are the opposite of specificity and have that variety of universality.* One thinks of the migration of fairy tales but also the comparison of any fairy tales. One thinks of the microcosmos as James Joyce's pluriverse so that the possible and real perspectives on reality are many, no innumerable, no incomparable, no that the world and the minds within it are essentially and perhaps most profoundly ambiguous, contrasting, inspecific. But one doesn't have to be an extreme relativist to appreciate my point that specific or inspecific stories—perhaps as the very definition or fact of a story--are subject to manifold interpretations, reworkings in terms of the variety of experience, and yet (an almost mysterious) continuity over transformation. Indeed it is obvious that many stories mean many things or that their meaning is in some sense "infinite". And my intent may be that the story is these ways only marginally and fewly. My theme is therefore that over the lifetime and between different conspecifics some nervous mechanism may tell the story but tell it different ways and flexibly; conversely, the inherent story in the environment may have a correlative unity within diversity (fooling the ethologists) and, thirdly, different mechanisms within the (if there are any mechanisms at all) may tell the identical story (but this may be apparent only to the individual having the perspective of each case and sufficiently wise to boot). Majorly, the ambiguity and regularity of each and any story may reside in different elements and aspects of the story, and do so with varying independence of the rest; this holds (see above) across the board, at least potentially. Another sense in which I meant ambiguous is as to decidability, clarity, and method of description: there may be false inambiguity in every instance known! In any event, the complexity of specificity, the pluripotency,, the multivalence, the multiplexity may simply be overwhelming (say in the profound sense of inheritance!)—and may

even confound any interest in specificity. And here we spillover into my point about either the innecessity or disinterest of scientists' hereditary schemes, and my point that we may all live the same 'story'. In any case, if we can't quantitate the ambiguity it is difficult to draw reflexive conclusions about the mechanisms of non/inheritance. Now it is conceivable that evolution has given us and our fellow animals that or those sets of behavior generalizing best over the particular interrelations of the different occasions of experience and necessity (and likewise behaviors vis-a-vis themselves). One is always fascinated (but dumfounded) with this topic of specificity and precision as deciding factors in events of the world or the mind (eg whether things virtually are manifestations of a compound of precisions and the overall laws, events, appearances, or whatever are factually derivates or illusions from an essential or total variety or "revariety"); comes the nervous system, we just have no idea about local or general organization obeying and hiding this specificity, whether holistically or critically—science runs on the presumption of the ignorability or conjunction of this matter of organization. It may also be noted that very slight and/or peculiar ambiguity may deeply mask hereditary or nonhereditary neural mechanisms (per my introduction). It is, by the way, not particularly clear how empirically v theoretically explicable nor synthesizable any or all of the things within this (as within any other) category are, in their specific or general function. It may be that we can say of the ambiguous stories that 'they are themselves ambiguous' so that in nature or the future many stories (like "many histories", or infinitely) may (dependently or independently) coexist; and also many such stories, you will remember, may achieve the same end or "storytelling". The reader, a fortiori, may think this about my own writing.

(5) stories with beginnings, middles, and/or endings. It will be apparent from the foregoing that segments, abstracts, and aspects of stories may tell a story, serve a purpose, stand on their own, operate differently, &c and what I am telling the reader now is that, if we have a story, the nervous system may inherit or simply construct (for that too is possible for the story) what must seem to us such pieces of stories; I am also saying that any story may have these functional parts (be, in a sense, tripartite). Consider this assortment: beginnings, middles, endings, beginnings-endings, middles-endings, beginnings-middles-endings, endings as beginnings. All are possible and may coexist in organisms: a middle may have an inspecific beginning but a specific form, endings may yet be beginnings within concatenations (one visualizes nucleotides et al), somethings may be but terminators, some may simply virtually be "start-stops" functions, somethings may simply start things and turn them over to another fate, something may be infinite or permanent but inspecifically start and stop, &c, and as to whole stories, these may play unidirectionally, bidirectionally, omnidirectionally, and yet require specific beginnings and endings (these may be quite elaborate or ultimately simple, signs or procedures, complexes or singularities, variable or definite, &c). In any event, only certain parts may be inherited v noninherited, quite independently. Recall order #4:homoteleuty and #19:homogenesis, &c. The reader ought go down and look at each type of order (and high order order!) as possible causes, effects, and embodiments of the variety of this and the other categories. Beyond psychobehaviorally, it is easy to suggest, see, and count on neurobehavioral examples; eg specific triggerable sequences between subcortic nuclei that are inactive and invisible until "released" by (perhaps esoterically specific) combinations of their states or activities (and then perhaps issuing esoterically specific or esoterically consequential results).

THYMOGNOSIA
Pat Gunkel

It is a perfectly reasonable idea that in certain tissues--prefrontal cortex, temporal cortex, cingulate cortex, insular cortex, basal ganglia, thalamic subnuclei, basal forebrain area, hypothalamic subnuclei, reticular subnuclei, &c --there are relatively transient and relatively permanent "polities". These are functions and constellations--arising in the course of experience upon and on the basis of the more permanent, overall, and fundamental anatomophysiologic organization of the nervous system--that are variously and complexly potential and active directive and motivational units; there is absolutely no reason for supposing that these are other than parallelistically organized in the tissues and very much integral with the spatial and ideal state thereof. These polities should arise, reside in, act from, and be strongest in those tissues free of other purposes, free of other effects, directly or indirectly rather and comparatively connected with, and/or importantly influential upon tissues, functions, and decisions that are the homeostats, administrators, and sources of simpler but more fundamental modes of the organism as exampled in behaviors, reflexes, cycles, arousals, rectification, amplification, emotions, coordinations of different parts and functions of the nervous system, filters, intensity controls, orderings, circuit builders, weighters, traffic cops, &c. I have shown by my discussions of order, waveforms in perception, and bases of behavior that it is possible to have all kinds of excellent organization, based on the simplest means, long before having to drag in what is primitively more specific and complex; in these regions the continua permanent-transient, overall-partial, hereditary-environmental, &c could and must be presumed to heavily organize and exploit such means. It may be imagined that, as often suggested, the nervous system is a hierarchy, a continuum, a chain, a behavioral framework, an "X", and a pile of equilibria of all different sizes, shapes, and kinds that are interrelated in trees, matrices, and nets. By hierarchy I mean that the voluntariness, complexity, rapidity, intelligence, learnedness, subtlety, delicacy, power, decisiveness, fundamentality, variability, range, &c may vary bi-extremally, continuously, evenly, regularly, and fundamentally between the farthest periphery and the highest centrality of the nervous system, or in any event there may be a rather simple 'treelike' structure; one could also truncate this and say that structures regulating arousal and perhaps most essential in determining overall changes in arousal, such as the hypothalamus or reticular core of the encephalon, ("the hypothalamus is the head ganglion of the autonomic nervous system") are the 'top' of the hierarchy: this has yet to be clarified and then proved. By continuum I suggested the idea of a straight-line function between two such extremes as above. By chain I implied that in part or simply one might think of the nervous system as an oligarchy, oligopoly, oligopsony, duopoly, duopsony, monopoly, monopsony, duumvirate, plutocracy, timocracy, direct democracy, representative democracy, plenocracy, plurality system, rotating system, bloc system, specialized society, burocracy ('vertical democracy'), anarchy, a totalitarian and/or fixed system within these, communism, &c or any possible mixture. By a behavioral framework I meant something a little less linear, a grouping of behavioral functions of anatomic or functional centers or fields of dependences, independences, and interdependences, some fixity and structure, some importance of criteria of success, and the like. By an "X" I meant that--using the criteria proposed above for a hierarchy--there may be two oppositely disposed (whether or not functionally counterposed or contraposed) hierarchies; obviously there may be more than two hierarchies, of whatever description, say related to all the criteria I named. By a pile of equilibria... I meant to suggest something amorphic, heterogeneous, dynamic, kaleidoscopic, purely mathematical, ambiguous, asymmetric, random, learnt, based on the orders in experience, hydrodynamic, unilevellar, organic, &c and/but in any case highly or infinitely complex. The reader will be familiar with my triad of trees, matrices, and nets from discussion elsewhere.

Now "polities" would operate against, whatever the nature of, such a background, as parts of and interactions with this background. Likewise would emotions, occasionally and developmentally, and all the things related to, comprising, and exemplifying emotions, in toto. # By way of example of what I mean by a polity there may be imagined a function or constellation involving an affect having been produced in the prefrontal cortex, that is released by or goes into action (essentially 'whenever it will' but) when an event in experience, in other tissues, a state in lower tissues, or a state in the prefrontal cortex transpires; in effect, a quantum of affect, arousal, association, directions, orientations, usable energy, correlation, usable control (order), posture, thought, action, memory, sense, and/or cetera--itself having infinitely diverse, infinitely scaled, infinitely specific, infinitely many, or the like determinative implications (and regularly interrelated with all other such or virtual 'quanta')—would exert itself. # This is not in the least hard to understand if it is seen that ordinarily this prefrontal cortex is the site of convergence and divergence of currents of like diversity, consequence, &c: muscular actions and reactions, emotional transactions, perceptions, et al. # So I am theorizing that on the basis of the regularity of flow and pattern—its range, contrahabituation, predictive anamorphosis, "transcurrence" (the importance of essentially or partitively regular flow and order over ingredient irregularity and disorder in flux over and beyond some and all tissues, structures, and cells in bringing these into reciprocal interrelation, reciprocal control, dynamic equilibrium, mutual determinism, and distant reciprocity), dense reciprocity with the critical regions discussed in the foregone paragraph, &c—a "cocrystallization" (transcurrent union) will take place between the prefrontal cortex et al and the critical lower regions, a concrescence and transcendental expression of all the elements intimated (drives, acts, sensa...), a synthesis and extrapolation of extreme quantitative and qualitative ranges of transcurrent control (level and kind) of arousal and control over the hypothalamus by the prefrontal cortex, and over the hypothalamic control of other structures concatenatively, &c), ordinary processes will lead to an ascent and differentiation of our rich emotional variety, by these things there will be an emotional differentiation of acts, cognitions, memories, percepts, &c and perhaps a reformation of polities into an emotional evolution of time (certainly a contrahabituative, &c centering on the future and its depths as, parallel to the present, unresolved and finally unresolvable; given the temporal extension, periodicity, and recurrence of things, the transience of things (so that we may speak of diachronic existence or "transistence" as being all that interests some cells, since there is a class of problems (or areas) demanding immediate action but beyond which there may suddenly be a rotatory transformation or an absolute or relative indifference to instantaneous as opposed to delayed, diachronic, macrotemporal, permanent, and absolute things (incidentally, nota bene, similar rotations may occur in other dimensions, matters, and cortices—such as a conversion from concrete, particular, small-class, irregular, certain, uncertain, simple, complex, correlated, uncorrelated, unique, unclassified, immediate, connected, disconnected, static, dynamic, inflexible, flexible, irreversible, reversible, &c things to abstract, general, large-class, regular, uncertain, certain, complex, simple, uncorrelated, correlated, and the other antinomies)), and the apotheosis of "prediction" in foresight, supratemporality, and the perfection of all that remains), &c.

1 This could explain—if regularization occurs; in a productive cortex—the liberation of laughter at 'irony', &c?
2 The "perceptual-conceptual curve"?

THE SPIRIT

Pat Gunkel

When considering alternative minds, and certainly in the formulation of ontology, the question arises, Whence the animus? Previously an arbitrary force had been imputed to one's models of perception, conception, feeling, action, motivation, and direction. It was likely assumed that in the face of such high contrivance a golem would conspire to abiogenetically materialize, consort with one, and to enslave itself to one's work. Fond wish, but very possibly excessive. Yet another turn and the wish may be answered.

Three serious possibilities exist by which the dream may be realized. (1) The necessity or fact (in organisms) of a foundational machinery of specific neural operations giving mind directly or via lower workings or instincts. Upon the basis of such personality or behavior the higher mind which is our interest might arise by modulation, as in the conversion of a cyclic, steady, and/or occasional—and yet insistent—repertoire into aesthetic and transcendental variations on a theme, autognostically after the fashion of the more purely sensory sphere. (2) Or of and from and perhaps by addition to and likewise an intrusive but answerable mechanism of disturbance and/or reward, whether univalent or multivalent, weak or strong, and instantaneous or delayed, an example being a periodic demand for thirst exerting inhibition and/or excitation upon a cortic mind. (3) Or merely, a mind and a spirit may result from the habituation of fixity, the impossibility of equipoise, the tissual compresence of motor connexions and sensory connexions making a proto-causal extrabodily loop so that unicircular patterns are possible and sensory patterns may give a corollary discharge to the motor link that is also differentially patterned so that a cyclodromy of "large figures of crude form" is anticipable and of sufficient degree that it will average supra-equilibrial and thus progressive over time so that it will become critical and central for subsequent habituation, so that habituation of this dominance will then become isospectrally and multispectrally variable and extremal, then invariant over the spectra and rather concerned with the pattern of transformational invariance than the simpler spectra and detail of the world, then and progressively following the lines of cognitive processes that I have given elsewhere so as to pass through the family of orders and their higher and complex combinations and behaving in contrahabituative adventurous and of course intelligent and conscious complexity, open-endedly (by definition!), purposefully, sociably, and self-preservatively (since habituation as here should, nota bene, give a conative homeostasis habituatively bored with the idea of succumbing (since so simple) and hence self-facilitatingly defensive, expansive, exergonic, &c, and/or "entrainment" may occur to "1" and "2" above, to social norms, and 'hydrodynamically' to the flows of nature).

(i) [illegible] the importance of the HC in [illegible] in "enlarged progression".

EARLY EMOTIONAL LIFE

Pat Gunkel

I suggest that in the early life of the child there is of extreme importance a pairing of familiar and less familiar things or a process of transformation between these two, insofar as the early emotional development is concerned and the movements of intellectual activity. It may be suggested that, paradoxically, sensory deprivation would have the effect of creating the major unpleasantness experienced by the child in creating anxious tension as a sort of hallucination of ambiguity in the absence of either familiar or unfamiliar stimuli that may distract the mind from simpler (granted ambivalent) lower-nervous emotions or behaviors and give stimuli that may either be analyzed or stabilize the nervous system by the vectorial pleasure of their past resolution as subjects of analysis (so that the familiarity actually accompanies a reevocation of the former and final satisfaction, as in the final simplicity of the stimulus). Of course, as suggested and further all such activity would occur in the presence of an unstable or metastable nervous system whose fluctuations are ambivalently deflectible in alternative emotional or state-of-transformation directions, and immediately in the early emotional development meaning would intrude into all such external and internal states and transformations so that the pairing would be, as we say in "meaningful" cases, subtle. It may be imagined that quite naturally the mind or soul of the child is a 'shuddering bed' of countless neuroanatomic and experiential equilibria in the sense this is discussed in "The Ways in Which the Nervous System May Function" against which there is a familiar process of progressive generalization and stabilization of what is essentially unstable and multiequilibrial (however, at least man is able to gradually acquire, as if riding on a bike, a dynamic and intercompensable or voluntary equilibrium to a degree offsetting this structure).

MEDIAN CORE AND INTRABODILY SUBSTRATES OF BEHAVIOR

Pat Gunkel

For the ignorant, my reference is to the visceral-olfactory-autonomic-smooth muscular-glandular-hormonal-reticular-motivational-regulatory-&c core of the central nervous system extending from the sacral spinal cord through the brainstem and prosencephalic centers onto the medial cerebral cortices and throughout basically transversely centered, and to the intrabodily nonnervous concomitants of its regulation, such as food in the tract and its interoceptive appreciation. How important, some ask, is this to the development and function of the mind? Qualitatively and quantitatively the question is a difficult one to answer.

Hunger and satiation, announced through interoception of the blood and alimentary vessels (eg chemoceptively)[3], are marked by their lengthiness and simplicity in time, from seconds, minutes, hours, days, months, to years in the information they supply the brain. But the tissues they supply have such afference concentrated (perhaps to some degree, perhaps as to relative isolation to other afference), perhaps are well balanced between afferences or states in the sense that transitions may be resisted but that therefore when successful are honored with dominance ("victorious stases"), are of sufficient size, contrasignally impregnate extra-core tissues, have such high metabolism (perhaps of labile tissue or tissue of a high pulse/proteosynthesis/engram ratio), perhaps have such an extreme presynaptic/postsynaptic or in-pulse/out-pulse ratio, perhaps have such an extreme non/spontaneity or allo/autorhythmicity ratio, perhaps have such an extreme fast- and/or slow-adaptation, perhaps have such or so little variety of these and other things, perhaps have such an extreme activity/passivity or activity/silence ratio, perhaps have such membrane/synapse/perikaryal/&c sensitivity or fluidity, perhaps have such great or little response complexity or versatility, perhaps have such high/low innate organization, perhaps have such extreme afference/tissue or efference/tissue ratios, perhaps have such collective rhythmicity/synchrony/&c, perhaps have such connective ubiquity/isolation, perhaps have such lower station (eg to the force, velocity, variability, &c or their antinomies of the flow of pulses; to the simplicity of the ception or fection; to the convergence and/or divergence of functions; to the simplicity of operation and vv; to the simplest feedbacks and feedforwards), &c that they are or may be distinct in their function and/or importance. It may be these things, without others, that account for the seeming importance of the median core in such things as arousal, drive, motivation, personality, overall mental state and operation, value, feeling, &c, say in terms of the lengthy simplicity of hunger and satiation, its power over the mind, and its intimate correlation with highest brain tissues such as the thalamic dorsomedial nucleus, hippocampus, and prefrontal cortex. Eg its permanence could give rise to the powerful entrainment of developing behavior by these centers, concerns, and equilibria.

The vomiting reflex could give rise to the metaphor of disgust, eg as in that which, taken, is later to compel rejection, eg as that which is misleading in its simplicity of design or pleasure. Bodily pain could give rise to the metaphor of pain, as in fear of ignorance, anticipatory hostility and avoidance, love of safety and one's own integrity, the emotional importance of proportionately small things, the suddenness of ability to be disappointed, the longevity of hurt and hence the differential ranking of values, &c.

NUNCOCENTRY AND ABSTRACT INTELLIGENCE

Pat Gunkel

In a 1971 article, "Cortical Visual Areas and Their Interactions", Mortimer Mishkin ascribes seperate visual roles for three cortic regions in the monkey: manipulating two plaques and usu a cylinder, over seven trials "parietal cortex" (angular or area 39) is specially important in a "landmark reversal test" and hypothetically for "extra-personal or allocentric spatial perception", "inferotemporal cortex" (TEp and 37; or 37 and 19av1?) for an "object reversal test" and thus for "pattern discrimination", and "prefrontal cortex" (apparently prearcuate-periprincipal: pp areas 9 and 46) for a "place reversal test" and thus for "personal or egocentric spatial orientation". I would respectively redub these "topoceptive, morphoceptive, and myoceptive (abstractoceptive) cortic manifestations"; in this connexion, it is of interest that initially inferotemporal exceeded parietal deficit in landmark reversal, attributable to the priority of form discrimination to multilocative change.

Note that the combination of these three gnosias could easily lead to higher thought in Jean Piaget's sense, by their algebra (morphoceptive viz intrinsic complex qualities, exchangeable; topoceptive viz absolute or presential place; abstractoceptive viz virtual place and virtual relations of modulably perceived identities (patterns) and presential loci); if these three converge onto the hippocampus, in the Papez Circuit emotional selection could be added on--this relationship to immediacy ("nuncocentry") could cause selection from infinite patterns for those that are compresent and hence Wilder Penfield's chronomorphic and holomorphic temporal lobe memories; on the other hand, these and nuncocentry might result from the indirect, inspecific, and noninstantaneous efference of the hippocampus and amygdala acting on the basal forebrain area, thalamus, hypothalamus, subthalamus, mesencephalon, and rhombencephalon. The faithful structuring of time and precisive nuncocentry of Wilder Penfield could follow from the triadic convergence. This renders nonbothersome the problem of why memories of the size, shape, and kind of those perhaps demonstrated by Wilder Penfield in and around the temporal lobe, from electrostimulation, ought be unique to one division of the cortex. It might be commented that: subcortices yielding such memories have been the dorsomedial and pulvinar thalamic nuclei, both of which are interrelated with the temporal lobe, and ditto the amygdala; "memory" is multitypal: occipital afterimages, loci, and traces, orbitoinsular affects, frontal simple and complex movements, sensations, &c representing process and attention are equally, however differently, memories--likewise for subcortices; it might be wondered why the above complex lifelike episodic memories have not appeared from cingulate stimulation (if especially true) with the cingulate gyrus and fasciculus as the spewage way or channel of the Papez Circuit from the hippocampus and many answers are possible, incl that here sensory afference would be relatively too indirect, different moments of time would be combined in meaning, action would become more important a la the frontal lobe, intrabodily (eg interoceptive, "crinoceptive", "crinofective", "crinognostic") concerns would dominate; likewise "hallucinations" are chronomorphic, holomorphic, and located: when they are confused with or inseperable from reality or action it is because they are there functionally or anatomically coextensive with the image of self and decisional "now"--likewise one would expect that deja vu (the sense of being Here, of being combined with sensory afference to give "luminosity" and intensity, of being combined with convergent past memories to give confusion of past and present), importance, reality (the sense of relevance and truth of past memories, say present-convergent), the act to remember (by deciding what is new and relevant), &c should grade off the hippocampus back into the introductory neocortex to give a present-past continuum because of the directness of connexion with the centers of driven arousal exhibited commensurately with proximity to determinant receptive hippocampofugals (obiter, amygdalohippocampal "switching" need only reflect their combined ception and fection of antagonistic drives, cells, centers, actions, sensa-- say where united in an adequate set of cells).

1. Applies well to all Tauber's prefrontal deficits: maintenance of perceived vertical during passive body tilt, interpretation of line drawings with ambiguous perspective, capacity of reversing standpoint when dealing with mirror images of the body, speed and efficiency scanning a visual array for detail; regardless of "corollary discharge". Also, B. Milner's stylus-maze test: can't follow rules of game but take eg-diagonal shortcuts (aware of but can't modify mistakes).

I might expand on one point. Temporal lobe cortex (initially and preferentially) having a nuncocentric continuum coming to be polarized present-past and represented hippocampus/amygdala-distant temporal and frontal cortices (in the posterior cortex the organization would be sensory-passive, so to say, but in the frontal cortex motor- and feeling-active and hence hidden by very esoteric plans and "intangible emotions", but in both cases an episodic continuum would be contratemporal to, in one case, the motor pole of area 4 and, in the others, the sensory poles of areas 3, 1, 2, 43, 17, 41 (or say six more primary acoustic areas), 51, 53, or the like) would mean that, in effect, hic et nunc-nuclei, of indefinite number, would be set up in the brain, by a subservient apparatus, themselves serving abstraction via evolution of groupings from indefinite presents and aspects thereof, eg by this continuum, and by this continuum only, segments of time and segments of space could facilitate intellectual discovery, serve perception, and serve action through their flexible combination and, thereby, intercombination; by this abstraction reactions of the individual could become perceptions; by this continuum the value of things could be logically seperated and equally faint engrams or euparallel functions could become potent; by this process different moments of time and the faraway past could become equipotent; by this arrangement logical diachronic mere and hierarchic ideas could be forced into existence; by this arrangement causes (by the composition of different snips of time, consequences as co-sequences) could be forced into awareness; by this arrangement thoughts (as the continuous cumulative resolution of diachronic consequential relationships, as the continuous re-infusion of these into the nuncocentric continuum, as the continuous weaving and reweaving of these as the results of all action, &c) could arise; by this mechanism detailous comparisons between and within different moments of time (past-past and past-present) could further the analysis and memory of present and past experience; in this fashion (by the extensive combination of total moments of time and their extensive results, which, applied to all moments of time, could eventually give rise to a so-called "hyperplanar mind" organized in terms of minute intersections of innumerable moments, which could eventually reverse the nuncocentric process and give derivative "sempicentric" mentality) a view of the future might come about; by this division of ecphoric reference between innumerable distinct past moments the exact, complex, and detailous embodiment of the present or of an idea in thought could become incredibly fluid, subtle, dense, definite, &c and perhaps mental movement and alternation could become correspondingly ready and abstract (eg an object could be taken as many objects, any one, transposed, permuted, &c; a thing might have existence only as a transcombination of aspects of the past and present); &c.

What is interesting in the first paragraph is that "myoceptive (abstractoceptive) cortex, demonstrated in place reversal" should be frontal cortex and esp comprising or comprised by area 46 (and/or 8) since these have been assigned inhibitory powers related to the basal ganglia (it may similarly be wondered whether the old or new basal ganglionic amygdala has not had and assumed "statogenic" and "tropogenic" functions re the control of drives eg embodied in or regulated from the hypothalamic nuclei, and, toward man, come to be dominated by neocortic relations, so that a voluntary slide-and-hold effect, fine-tuning, complex equilibria, texture, &c have developed and become important, eg by the evolution of discrete conversions in a purely tendential tissual complex), cingulate area 24 (however whatever), special sectors of the thalamus (eg dorsomedial subnuclei, centrum medianum, &c), cerebellum, stem fabric, &c/al. Eg this may imply a kind of antagonistic cooperation between the posterior and anterior cortex; even more important, the division of effective anterior cortex into receptive posterior cortex, or of action 'fixing' perception, may work a miracle: intelligent will, infinite intelligence, action as formulary translation of perception, centrance of perception on action; the basis of abstract comparison; the evolution of taste; the reversibility, &c of relation (or the source of imagination); in other words, we are inclined to look beyond the ascription of these functions to just the frontal eye fields and to consider all the frontal afference and efference individually and in frontal-polar eliminative unition (in fact, perhaps the pole performs a similar statogenic-tropogenic function on the precedent individualistic frontal cortices, or in a "wedding cake" frontal lobe).

amygdala may [illegible] considered "a supplementary motor area"!

One possible combination of statogenic and tropogenic functions in a tissue, such as the amygdala and all other subcortic nuclei (that might involve "polities", the laterogeniculate, &c), could be that the tissue would assume a single state (like a 'mood') and remain in that state until some fundamental reversal in conditions occurs, such as a cortic quenching of thirst by a suitable environmental transaction, and then become neutral, assume an opponent state, or any one or several of many other states; at first what would be a very simple process would soon and especially eventually develop an extremely complex mechanism of interstate transitions correlated with sensa and actions, but these would be melodies as developed from such simply stubborn states; it is easy to imagine a "dance" or "ballet" developing from the harmonious integration of multiple states interleaved with action, as in the evolution from reflexes to "reflexual ghosts".

TROPOGENESIS AND STATOLYSIS

Pat Gunkel

Changes in connectivity, size, &/or metabolism of the basal ganglia may be at root of the superb intelligence of man as distinct from his near neighbors or as expressed in the primate ladder. Various possibilities come to mind. One is that the striatofugals exert transient diffuse inhibitions at points of critical flow and thereby are "tropogenic" (change-producing) or "statolytic" (solving equilibria); the direct effect, please note, could be to compel occasionally special motor attention to and development of aspects of action and reaction, but there may also be taken into consideration the behavioral and mental nature of an organism whose behavior, though complex and well-primed, is metastable and highly varying (as in, on the emoto-semantic side, the fluidity of facial and general bodily expression in primates approaching man). It is very easy to think of the worth and basis of a multi-areal hierarchy, as in the series of frontal areas and subareas, of a "spread equilibrium", resulting from basal ganglionic coaction in the division and multiplication of references. One thinks of the late but gradual human ontogeny of these areas (I believe that there are sharp known neurophysiologic differences in rate and staging of development in these areas between man and his close relatives). One possibility is that, in pair with its antinomy, a 'weakening' of direct orbitohypothalamic and/or orbitosubthalamic, or the like, connexions has transpired in favor of increasingly multisynaptic controls in areas from the pole. I have suggested the concept of "hierarchic sharpening", a trend visible in at least the visual cortex to sharpen and clean the corticocortics between adjacent singly successive areas, and perhaps this has application to the frontal "ladder". I rather think that there is much that I would add to the picture and straighten before leaving the matter. I have been impressed with the nervous evolution of "dromic circuitry" and serial circuitry--exx are J. Papez, Pandya, Yakolev's orbitotemporal closure of the limbic lobe, the habenular circuitry, the apparent interlateral origin of the cerebellum and its increasingly evident corticonuclear circuit, the intrahippocampal circuitry, perhaps some (new) thalamocortic circuitry, perhaps some interlaminar circuitry, perhaps some diareticular circuitry (that might consist in differential rates of feedback down and up in the brainstem or even in differential lengths and rates by dispersion in the stem), perhaps some unspected hypothalamoamygdalar circuitry, amygdalothalamic circuitry, unsuspected basal forebrain circuitry (eg tuberculotemporal), corticocortic circuitry between the speech areas, sensory efference circuitry, and now complex basal ganglionic circuitry--whose explanation may be that it leads to a serialization of mental and behavioral processes whose specific consequence is "to turn time sideways" and permit contradiction, orientational diversity, independence, "spreading", abstraction, grouping, categorizing, &c of mental processes derived, paradoxically, from an alignment of experience in these regular loops. The value of the loops may be odd: by adding this 'hole' in time contrasts between different moments of time may be created by different rates of travel over the hole, or the hole may create a catalytic or critical effect by biasing delay; it is a little like grabbing a needle: ordinarily an afference would result in an instantaneous and contiguous reverberation, but with such circuitry as I am suggesting a point and an instant would acquire area and duration and instead of the process becoming infinitesimal and intensive it would become infinite and extensive ("toparchic") or what might be called a "diachronic evoked potential" (even once an apparent evoked potential had terminated, information processing would continue because the holish loop had created a dispersed representation). I have suggested that distant tissues "cross-familiarize" and evolve "transcurrent control" over one another or undirectionally; this may be related to or find expression in the heterogeneity of apparent sign of neurotransmitters in isotopic isocellular tissue: and for various reasons striatopallidal PSPs may be mainly or partly instrumentally excitory.

Notes from Previous Page

1 An interesting question in postulating that dopaminergic development toward man effected speech, tool using, civilization (eg ritual behavior, ritual emotion, ritual lines of thought, ritual (concentric) associations), &c is whether stereotypy has to repeat itself eg obviously; instead the dopaminergic 'repetition' could be in the subjective latent mosaic perpetuation of the pattern as a future and cooperative memory. ←#←

← Or the "repetition" could be a [illegible] selective [illegible] interlocement. Any such passive positions of systems of actions coincident with [illegible] parallel perceptions could include broad transformations and furnish cognitive transformations.

2 An interesting possibility is that the basal ganglia (a la T. L. Frigyesi and Aaron Rabin) converge at the globus pallidus in such a way as to occasionally force (eg caudate vs putamine) resort to longer circuitry/other cortices, say by excessive and preemptive inhibition, say force involvement of area 6, 8, &c beyond area 4, or the like.

3 Or that may just represent self-locking by cells differentially releasable by afference (but one reason for a totally inhibitory tissue could be apparently 'self-exciting'!).

"Hypermetamorphosis" produced by tropogenic or statolytic basal ganglia or striatum may be analogous or complementary to the dromic circuitry, for, by forcing incessant change and adaptation upon a tissue or upon percepts two things may result: the natural representation of the information and the preference of its subject (here the same) will be dynamic and coincidental (what chance phenomena concur at different moments of time to corroborate or exploit, blend with, these fast-fading past impressions), but, perhaps as the second far more important, the stress of the tissue will atomically be on predictive contents and attitudes (ie successfully predictive) or on extrapolation; whatsmore, the product would be a hierarchy with inter-level or vertical prediction and consequently giving the basis of inductive-deductive reasoning. This triggers thoughts that each day the mind may be made so intent on not repeating itself, because of a peculiar statolysis whose intensity is in a sense limited to a day, that in effect each day it will destroy or exhaust itself in building up an image of that day (as in an hour-glass in whose inversion the sand tumbles down once more); by the cross-inhibitory pairing of possibilities the mind may broaden its eye each day (and this comparative process may yield its lasting content by a process of exclusory categorization wherein form becomes content).

Monosynaptic hippocampofugal effects seem excitory and this raises the notion that the hippocampus is the cooperative opponent of an inhibitory striatum, at least at some point, in some degree, in some function, in some sense.

Destriation could leave the cortex in the peculiar position of, having lost its correlative component of change, yielding dynamic patterns that are static or viscous and virtually static: ie (at various levels) fixed, rigid, will-less, fragmented, vibrant (choreic and oscillatory), autonomous, stereotyped, hypermetric, adiadochokinetic, &c.

I have pointed out that the consequence of alternation is the generation of dimension. If these dimensions are combined the tendency is for the mind to go to the extremes of these dimensions, to function on the basis of intersections of these dimensions, and reduction. It is very interesting to consider the result of a forced alternation in emotional representation on the cortex, say by a dual submission of arousal and disarousal, transcurrently, to orbitofrontal cortex. If a basal ganglionic system effected rapidest, fullest, lightest, oftenest, and most numerous, most unstable alternation, and the greatest purely dynamic organization, here, a process of abstraction and referential complication of emotions would occur, compatibly with the other doings of the organism in a synthesis of personality and in an introjection of affect (or pieces of different kinds and degrees of arousal) into all perceptual and effectual content of the mind; the consequence of this would simply be a gradation of mind into very high conceptual levels. One could initiate and expand autoreaction or self-objectification and self-projection into the environment, with a concomitant organization of the environment about this for once externalized self; the consequence or simply concomitant of this is that the motivation becomes active and the sense of time, from self-observation, becomes drawn out, which of course conduces to planning.

It may be wondered whether the hippocampus, in parallel with the neocortex, has its own external efferent and afferent inhibitory complements, analogous to the striatum, and one immediately thinks of the septum, accumbens, &c. In connexion with the above suggestion of the cooperative antagonism of hippocampus and striatum the fact of a possible relationship of dopamine to psychosis is of interest. The transmitter is alien to the hippocampus but not to the accumbens or amygdala eg: the amygdala is associable with psychosis, seems to function as something of a switching and tropogenic system, is basal ganglionic in one sense or another, and, perhaps it is forgotten, has striatal fringes and the unexplained presence of the tail of the caudate. It is also noteworthy that the thalamic dorsomedial nucleus is interrelated with the anterior frontal cortex, the association temporal cortex, the amygdala, the sense of time, associable with psychosis, like the basal ganglia, is described as bisignal, seems to involve switching, &c. It may be suggested that we are dealing with analogous tropogens that switch whole states of the mind.

A LIST OF HYPOTHETICAL FUNCTIONS OF THE BASAL GANGLIA

Pat Gunkel

1. Induce sleep.
2. Alternate sides of the brain, eg esp the cortex. If not alternate, inhibit, modulate, conjugate, regulate their synchronies, complicate, &rc. Create, extend, or serve interhemispheric asymmetry.
3. Regulate degree of localness of cortic &rc activity; give topic properties to cortex.
4. Alternate behavior.
5. Alternate and hierarchize cortices (points, areas, lobes).
6. Extend conditioning &c in time. Help the sense of time.
7. Complement antagonistically the cerebellum.
8. Serve memory (eg by acting on the cortex, containing memory, embodying longterm memory, eliminating distractions, postponing actions or reactions, regulating emotions, serving higher cortices, inhibiting or exciting inhibitors, stereotypic "learning", snapping or gluing memories, freezing complexes between many centers, fusing the activity of many centers, clearing neurons for new memories, distributing neurotransmitters or other substances, deleting patterns for the sake of progress, coacting with the hippocampus, &rc).
9. Store neurotransmitter(s) or other substances.
10. Produce or reproduce neurotransmitters or other substances.
11. Generally or selectively distribute neurotransmitters or other substances.
12. Part of an extended system of like structure &r function (including certain neurons in the cortex, and the thalamic reticular system (sensu lato: midline, intralaminar, reticular, & other nuclei), the diencephalic intraventricular stratum, the central gray, the intermediate gray of the spinal cord, &r many other structures or continuities).
13. Tropogenesis and statolysis (the creation of change and the solution of equilibria).
14. Fixation. ("stabilogenesis")
15. Serve rote, reflex, repetitive, stereotypic, automatic, necessitarian, obsessive, &rc behavior. Serve ritualistic action, procedure, concern with the future, &rc.
16. Association (eg reception, transmission, interaction, or reciprocity between any point on the cortex, any subcortic structure, &c; serve flux of information, cooperation, control, inquiries, inhibition, attention, reciprocal rhythmicity, combination, contrast, common afference or efference, &c; serve sensory, motor, higher and lower intellectual, emotional, instinctive, &rc correlation inter se).
17. Sensory &r motor conditioning.
18. Counterpole to reticular formation (eg of the midbrain; any such equilibrium might actually have useful dynamic properties—undulatory, metastable, polyequilibrial, probabilist, answering, "stairing" (creating steps), reverbatory, fluidic, stoichiometric, multiplicative, &rc; inhibition of inhibition).
19. Counterpole or inhibitory stabilizer of the cerebrocortex.
20. Serve intellectual progression or tropoception (eg by negation of specific patterns to be systematically diverged from). "Neolepsis"--grabbing onto the new.
21. As a self-inhibitor (eg is the neostriatum not so much externally inhibitory as internally in order to produce a highly viscous or claylike patterning and manufacture of hierarchic patterns or motor memories?).
22. Focusing (eg active dominance, mediated competition, field size control, &c).
23. Stabilizer of motions (antitremorogenic), servant of static or dynamic postures, &c.
24. Fineness, precision, and complexity of motions.
25. Innate residence of instincts, drives, reflexes, ideas, &rc.
26. Homeostat, exchange, or other regulator of subcortic, hypothalamic, primitive, &r the like economy.

27. Reduce familiarity, destroy set, &c (cf eg # 13 & 20).
28. Cluster, parse, unitize, &rc activities, time, &rc.
29. Reverse thought (controllable retrograde amnesia, phasic release of serial memories, or the like).
30. Slow &r speed, &r synchronize &r desynchronize the general or a local EEG.
31. Clear cortex &rc of entropic or isentropic mental &r nonmental patterns, or otherwise personally or dependently restore the brain, during sleep.
32. Somnal "countertilt" (tilts are hypothetic gradients that would be temporarily established and then run down or compete against other gradients in, eg circadian, rhythms for probabilistic, mensurative, sortative, disposal, &r other reasons; certain cells, in contradistinction to others, might be shut down, repaired, endocrinally changed, resupplied during sleep or the like).
33. Decide "finality".
34. Serve certain cerebral rhythms (eg spindling, infraslow, &c).
35. Regulate encephalic or other vasculature (eg neuroendocrinally).
36. Autonomic.
37. Serve free, fluid, &r large movements (eg ballistic) by inhibiting inhibition, limiters, &rc.
38. Fluidize exchanges between different points and parts in the brain by modifying (curtailing, removing, contraphasing, postponing, &rc) prior or other activity.
39. Serve cortic &rc "snapshotting", eg prefrontal, motor, occipital, or occipital imagery.
40. Ontogenic learning.
41. Interphase activity.
42. Serve condivergence.
43. Serve axes of movement.(eg 3 straight, their reversal, circling, and spiraling).
44. Rhythmic movement.
45. Synergistic movement.
46. Reversal of movement.
47. Interact cortex and thalamus.
48. Volition and voluntariness.
49. Oblivescence.
50. Inhibit movements.
51. Give independence to parts of the brain.
52. Arrest purpose.
53. Phasically or ontogenically accelerate movements (or enlarge the bidirectional celeratory range).
54. Regulate extension &r flexion.
55. Regulate corollary discharge &r sensory centrifugals at all central-peripheral levels.
56. Serve "anamorphic counterbalancing" of drives, musculature, &c (eg the ontogeny of standing in a decorticate).
57. Provide continua of diffusion, generality, size, rapidity, memory, chronocorrelation, multiplicity of activity, convergence, divergence, sign, manner of functional processing, interconnexion, complexity (eg simplicity of action), stereotypy, reflexivity, automaticity, disposition to lower vs higher centers, difficulty, exclusion, frequency, amplitude, EEG synchrony, finality, recurrence, multiplication, strength of conditioning, postponement, &c: by the topography, loops, descending-ascending axis, conicity, structural heterogeneity, chemical and physiologic gradients, fibroarchitectonics, cytoarchitectonic variety, alba-ventricle distances, enclosure, multisynapsis, cellular bunching, glial gradients, vascular gradients and structure, solid inward-outwardness of the nuclei, &c.
58. Shed cells phylogenically to the cortex, thalamus, &rc.
59. Change phylogenically, create novelty of function by exception, or the like.
60. Act on fibers of internal or external (capsular) passage.

61. Serve extraordinary convergence on single neurons (the number of synapses per cell is extremely high).
62. Serve extraordinary convergence by upping the requirements for threshold discharge.
63. Serve early development (eg somatomotor, cortic control, self-conditioning, cortic conditioning of subcortices, &c).
64. Limit activity or overspontaneity.
65. 'Explain' the frontal lobe (which would simply add topic and circuital specificity, complexity of association, general functions of a cortex, memory or function, &rc to the basic basal ganglia or basal ganglionic-related mechanisms).

This list has the same qualifications as my other ideas. The ideas are variously related, variously dependent or independent, variously complex, unweighted, unsorted, variously coextensive or isolated, variously compatible or incompatible, variously reinforcing of one another, variously important, variously probable, variously interesting, variously complete (the list as a whole and each of its ideas), variously definite and defined, variously theoretic &r empirical, variously combinable, variously rankable, variously implicative and disturbing, variously familiar or strange, variously ambiguous, variously qualifiable, variously extensible, variously new and understood in my own mind, ambiguously seperable, variously exchangeable, variously competent, variously subdivisable, variously understood, variously provable, variously comprehensive, variously pertinent to or so in various animals and phylogenic and ontogenic stages, variously depending on the individual nervous system, the individual task, the individual question, &c, variously essential to an understanding of the brain (eg disturbing), variously reflected in other parts of the brain or the nervous system generally, variously innate vs developed vs learnt vs developable, variously anatomic or physiologic in evidence, degree, embodiment, illustration, &c, variously reducible to certain structures or functions, &c.

The purposes of the list are similarly many: hatch ideas, seperate ideas, systematize ideas, trigger or lead or kill research, modify research, invite weightings, invite comparisons, discourage overenthusiasms, complicate research, enlarge the picture of the brain, encourage intercorrelative research, encourage splitting of hypotheses, illustrate the flexibility of thought and facts, encourage concern with the whole, explicate processes, encourage more specific and exact research, exhaust appearance or possible interpretations of data, analogize systems, kill stereotypes, &c.

Similar things can be produced for other parts of the brain or what is known in neuroscience. The object of neuroscience is to produce all such things, and then handle them as implied above.

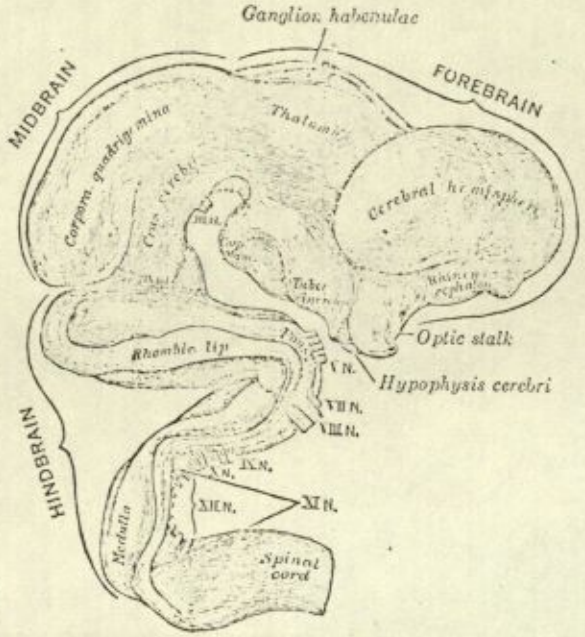
STEM ROLES IN HIGHER MENTAL FUNCTION

Pat Gunkel

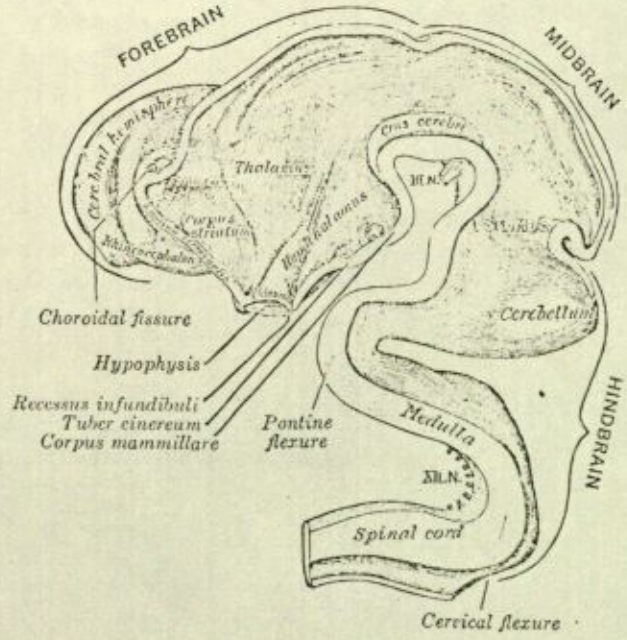
Walle J. H. Nauta has dwelt on "limbic" circuitry, and the signifigance of this may be that here we have a system controlling memory and attention, thereby learning, thereby the direction and thereby capacity of the growth of the mind. The following speculations are in tune and being tuned up.

Throughout the brain there runs a fascinating interface to the cerebrospinal fluid and the central nervous system may be a sheet polarized between external and internal interfaces. When cell masses enlarge the distance from this fluid, as they do in the striata, sensu lato, the consequence may be some trend to slower function and hence inhibition, as in consolidated or viscous behavior, sensu lato; hemispheric evagination, in mammalia, may have served maximization and evening of neural function in the form of an extensive fluidic interface. One might wonder whether special connectivity of the striata ought be searched for according to the degree of proximity to the ependyma, and/or the functions may change thereat and therefrom. Similarly the elimination of midline nuclei in the thalamus may have served the enlargement of its fluidic interface and, perhaps specificly, the preferred apposition of the peculiar, (perhaps more topographic, more corticocentric, more histologically and cytologically evolved, more fusive, more 'neocorticocentric', &c), dorsomedial, anterior, and pulvinar nuclei, perhaps for the acceleration of activity therein (amount of firing, of flow, of molecular synthesis, &/rc) or for the evolution of a focus of attention (additive, subtractive, multiplicative, divisive) serving learning by its transontogenic role in determining the essence and final form of the architecture of the mind. One of course thinks as well of the hippocampal fissure &c (where the convolution of this cortex may have served fissural obliteration and graded tissual thickening, say as a small but elegant bottlekneck a la the striata serving the capture of pattern, the same for the tumorous archistriatal 'corticotelic' multisectoral amygdala), the cava septi pellucidi anterius et posterius, the hypothalamic sulcus, the mammillaries, the sylvian aqueduct, &c. At the same time there must be considered the vascularity, red/blue blood ratio (spectrum) and priority, blood/CSF ratio and commonality, histoflourescent neurotransmitter distribution, &c.

I suggest that in the stem reticula, the limbic paramedian, and/or the like the randomness of the connectivity may give intense but transient memory, abetted therein by the high activity of these tissues, entraining the higher brain for any number of reasons, eg ontogenic primacy, transontogenic guidance, obedience to simplistic but powerful reflexes, extensive-intensive capacity (as above), close gradient association with step and gradient functions (in gate regulation, tonus, endocrine polarity, trophic importance), &c.



–Exterior of brain of human embryo of five weeks. (From model by His.)



–Interior of brain of human embryo of five weeks. (From model by His.)

24 0 73

Dr. Nauta,

When you mentioned yesterday the peculiarity of the basal ganglia, the extreme convergence of its afferents contrasted with the very incomparable nondivergence of its efferents, I thought at once to mention that I have never heard of a structure where the physiologic versus anatomic finds on connectivity were more discrepant, implying, as we've discussed before, that there is something very inaccurate about degeneration and staining methods applied to the basal ganglia, especially certain of its hypothetic connections, eg striatocortic, and the recent crop of finds, through the application of new neuroanatomic methods, that the brain's connections are stranger than thought also came to my mind, for these new methods producing startling results in cases are really sofar so little used that surely the complete and true architecture of the brain's connections, while it may preserve certain old positive ideas, may superimpose a largely or wholly new quantitative and qualitative picture. Now, of course, I realize this idea is very upsetting and quite speculative, and I wonder if we cannot contain it a bit in this way.

The 29 Je 73 Brain Research carries an article on page 1 by A. Nobin, et al, "Axonal Degeneration and Regeneration of the Bulbospinal Indolamine Neurons After 5,6-dihydroxytryptamine Treatment", combinable with recent work showing regeneration in the septum, hypothalamus, and elsewhere, suggests to me an hypothesis that neurons extremely high in neurotransmitters (as producers or no; eg monoaminergic or cholinergic) may have an ability to regenerate their fibers, or a disproportionate ability obscuring connectivity patterns implied by degeneration methods. There are obviously many regions of the brain and many of its fibers that would be obscured in this way. In any case, there would be a steep scaling of different regions and fibers if this principle of varying vitality holds. This is particularly interesting because our knowledge of many of these qualifying regions is especially poor and, where there is knowledge of any kind, connective asymmetries are familiarly implied; at the same time as these regions are of extraordinary importance and to a certain extent can be classed together. I am thinking of the basal forebrain, the amygdala, the hypothalamus, the hippocampus, other structures, and the basal ganglia. The basal ganglia are notably high in putative neurotransmitters and other trophic substances, and have that ventricular relationship that I have suggested makes a structure a candidate for neuroendocrine status, sensu lato or in a novel sense.

I am writing to suggest that my advice to David Hubel, which you may recall, that experimentation should be based on peradventures or the systematic exploration of stochastic ranges, is ideally apposite here, and that someone should look at a range of these chemically peculiar structures and see whether they are not typically regenerative to a degree impugning their traditional connectivity, and with basic importance to the understanding of the brain.

Sincerely,

Pat Gunkel

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Helen, the acquisition ? [illegible] images)

MAN AS AN ANIMAL ABLE TO BE TAUGHT SELF-CONDITIONING

Pat Gunkel

The title states half the idea I have in mind but there are some further distinctions having to be made. I have in mind the peculiarities of human language and training which involve the attainable acquisition of types of conditioning such that questioning and the like behavior become continuous, arbitrarily long, and self-serving, to some degree as the result of language or emphatic training of the babe. I see the necessity for a cortex sufficiently leveled and of levels sufficiently independent in at least one direction for a hierarchy that enough transformations of neural experience can occur that levels at the top are able to involve conditioning of any of the subordinate levels of experience and an innocuous freedom of thought, without interference from lower levels of the nervous system whose dominant foci would otherwise degrade the higher levels of activity.

Some random speculations. The "spatial map" supposedly found in the rat hippocampus may in fact represent the product of the highest somesthetic cortex using the hippocampus to divert attention to itself so that this sort of relationship is set up. Possibly in the rat such a map is nearly as high as the rat's association goes, due to the paucity of preceding association areas, so that these functions, otherwise surpassed in man, in the rat are dependent on areas closest to the hippocampus or the hippocampus itself. Toward man it may be that influences on the hippocampus move upward and are restricted to the highest association cortices and it is by virtue of their powers over the hypothalamus &c through the hippocampus that they are able to dominate and subordinate lower cortices and allow higher thought or conditioning to come into existence. It is conceivable that the expansion in area 28 toward man indicates a relative increase in neocortic inputs to the hippocampus (if not or in addition to the cingulum) and perhaps specifically from the highest association cortices or even parts thereof (eg late developing parts); it may or may not be that an advantage accrues through control of different parts of the hippocampus in independent or unitary operation. The septohippocampal fibers, exerting suppressive cum prolongative effects on the hippocampus, may be responsible for the peculiar longevity of hippocampal memories; possibly toward man the neurotransmitters (such as acetylcholine) given by the septum to the hippocampus are increasingly routed in man through the mammillary body or directly through the anterior thalamic nucleus (or as circulation from the hippocampus to the latter) into the gyrus fornicatus (allowing neocortic complexity) and then to the hippocampus (so that the inhibition involves neocortic complexity); possibly there is an increase of fibers descending from the hippocampus to the septum and increasing the activity of the latter that more neurotransmitter (or predecessors &c therefor) is eventually delivered to the hippocampus (and there may be a similar increase of neurotransmitter transported from, by action upon, the mammillary body). The peculiar effects of learning upon hypothalamic neurons may reflect neocortic influence via the hippocampus (in the rat). It might be desirable for fibers descending from higher to lower sensory cortices to be trimmed so that the cortic levels gain autonomy over their predecessors, at the same time as mechanisms evolve for the higher to control the lower cortices (through dominance, intrathalamic inhibition, &c); the question must be asked what should be the evolving relationships in this way of the motor areas inter se and what is in fact the case?

"What is it like?" (active voluntary disciplined memory). Notice the question in "is"; and "it" is a question of reference (questions of reference can open up seekings for relation); "is" conditions the response "look up, here something is proposed". Re the first quote, notice how a grammatical sentence like this can be arranged in a necessitarian fashion: certain formal necessities (matrically) can originally be conditioned and the absolutes build (eg by autocombinative multiplication). It can even be argued that this is the (original &c) function of pronouns, question marks, &c, and especially of early 'emphatic' communication; what a beautiful function for Wernicke's area or the like, to condition certain gross bodily, 'orientational' postures (eg the auditory-vocal system asking the visual system, "What do you mean?" (the meaning, as conditioned, would be self-referent...)). Note that if you can name actions you can condition words to model actions in verbal or mental propositions; one might therefore want a cortic area in which actions would intertransform, giving them classification, and 'in which' audiovisual association could occur that language could inform the mind of propositions. Note how the conditioning of the above "postures" would be tantamount to conditioning an open, "situational" replacement of all mental preoccupations, leading ideas, &c (perhaps eg which normally involve a dynamic continuity or "canyon" or "street" so that such "postural" switching would actually involve redirections or perhaps a whole new openness to diachronic and just large &c events).

Note that posture is automatically communicative. Thus those "motor" cortices concerned with posture are automatically communicative. The relations of vocal sounds are likewise posturally and procedurally communicative due to their indicative economies and the integration of every bit of motor behavior with sensory perception and conception. The sensory cortices likewise are automatically signifigant for the possibilities inherent in the percepts and concepts are implicit, complementarily to the motor sphere. Thus it should not be surprising that area 7 sits next to Wernicke's area.

(Referring to my paper, "Cubic Sets and the Place of the Mind") is it possible that man is an animal (as able to be taught self-conditioning) able to be taught to form sets of sets (ie able to be taught sets of sets!)? Such a utilitarian attitude of a mind to its own content may make man unique. Note that, as opposed to an anthropomorphic "catoptromancy" where the whole body or the body especially would have to be visualized (say in the recognition and subsequent modulation of the line between the subjective and objective worlds), the algebra here would be geocamptically and idiomorphically universal: are the 2 alternatives causes, effects, or concomitant equal or unequal effects?

[illegible]

(not only 'finality', also senses of the true, real, important, immediate, different, proper, &c)

'FINALITY OF THE CONCLUSION OF RESULTS' AS REGULABLE

Pat Gunkel

It would seem that structures like the amygdala, thalamic dorsomedial nucleus, mammillary body, and hippocampus were originally concerned with the "finality of the conclusion of results" and that this finality of the conclusion has progressively been brought under neocortic control toward, and especially in, man so only the neocortex decides what is final. The former structures would be such because they receive the slow and closed workings of the hypothalamus, pituitary (endocrine feedback via the environment or via experience), &c. Through disturbances in these areas hallucinations may result through arrest or alteration of the judgment of conclusive certainty so that the probability of progressive thought is affected and interpretations begin to blend into themselves. By controlling eg the amygdala, the cortex may directly prolong its thought, suspending disarousal for the sake of deeper and motivated thought. For this function the above structures may be eg cleared daily and consist in temporal gradients or "tilts" that reflect, cause, or modify endocrine cycles and changes, sleep patterns, coherence changes in the EEG (which may progressively 'cohere' and synchronize over the day or vice versa and reverse in sleep--note effect of reticular formation stimulation). The effect of electroconvulsive shock may be to clear or 'retilt' these structures and in this way to set the clock going again. It would be interesting if infra-slow, circadian, and longer rhythms set the intercomparative clock of the temporal sensibility of temporal lobe and other cells (eg in giving Wilder Penfield's cinemic memories). Might certain synapses gain a 'day's supply' of chemicals, eg neurotransmitters in vesicles, that would progressively run out across the day and eg in this way progressively tie memories to time in proportion to their strength or as successive cells 'sink' into inactivity and pull attached memories down with them in regular fashion (is there a temporal gradient 'down' or 'across' the hippocampus?); eg is this the purpose of giant mossy synapses (or do these regenerate or reconnect daily?), mammillary body neurotransmitters, &c? If the cells of certain tissues changed drastically, totally, or fundamentally with time (note septal and hypothalamic regeneration--which could act indirectly in connected cortices!) could this give a temporal sense (eg transience, distance in time (eg by decreased availibility of general memories), concrescence, emergence, slow emergence, slow correction (or eg due to an 'isolation', eg of a yet-vital, ie key, tissue), &c)?

The ability to regulate "the finality of the conclusion", by neocortics with the amygdala &c, could give a liberation of volition such that--by sheer stress, discontinuity, gross or fine rate control, or the like--the fabric of time ("unconscious time") would become twisted, time obvious or hypostatic, and time metric, important, and extrapolated into a concern with the future (and hence a better organization of the past). It is still a very good bet that the extremely regular firing of a class of mammillary cells gives us time in 'higher' senses (and perhaps especially in man). The flow stopping in the hippocampus, units of time could there be released and releasable as blocs (eg chaotic but for their temporal schemes).

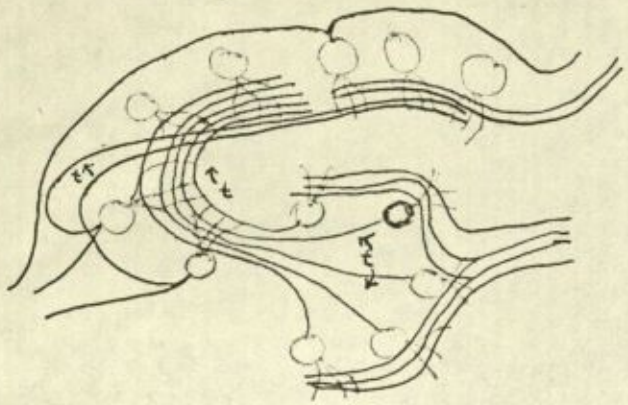
If the above structures are indeed concerned with "the finality of the conclusion", then neocortic control over this could give an astonishing result: a sense, communication, and cognition wherein any two possibilities could be combined, an analogue and partitionable mode of signifying things could occur

(ie "precise signifigance"), an information-theoretic reduction of things, the origin of verbal behavior possibly together with its asymmetry, serial thought, &c (eg the fact that something was "exactly this type of red" or occurred at "exactly this time" (randomly skewed) could suddenly become fantastically important--such criticalness could lead to symbolism because of its precision and control over uncertainty, 'consciousness', and motivation leading to the carryover of thoughts with the "why not" retrieval of symbolic references or "catches" between people).

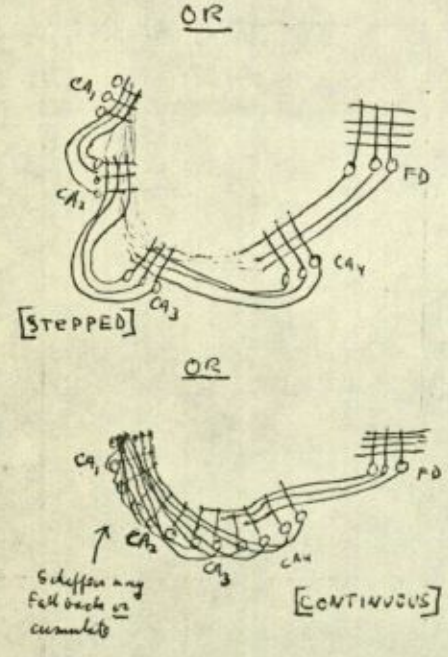
The function of the melanin in the human brain may be to create gradients that extend across the lifetime or appear in early ontogeny eg by creating topic gradients on or creating staging in the cortex, eg successive frontal and prefrontal inhibition, or specifically progressive regression of lower patterns of behavior. Unless it is concerned with neoteny or extension in man of the period of plasticity (which <u>could</u> be a net gain) and/or development.

THE HIPPOCAMPUS

Pat Gunkel



Certain relationships in time (eg changes) will now have a certain relationship in space or to each other; perforant path waveforms will now be spread out in cornu ammonis so that all parts on the waveform will appear simultaneously on a pyramidal apicodendrite (on the other hand, successive pyramidal apicodendrites and apicodendritic trees will constitute a shifting temporal bias spectrum). Yet the Schaffer collaterals of these same pyramidal cells will effect another temporal 90° rotation (a reinversion) so that 'the original temporal' relations may appear in CA_{2-1}. During the period of original inversion all kinds of interesting endogenous and exogenous interactions could occur. What are the timing relationships here? The septogenic theta rhythm could conceivably cause, ia, the pyramids to fire off all the simultaneous input on the apicodendrite, and to fire in regular series (in which case the patterns would re-appear relatively inverted on the Schaffer-synapsed CA_{2-1} apicodendrites—it is interesting reviving the old idea that a (eg Purkinje) cell may be fired by either vertical (serial) or horizontal (coincident) patterns on its dendritic trees). On another hand, the bifurcated sub-pyramidally running axons of the (eg) CA_{2-1} pyramids and the sub-pyramidally coursing ammonopetal part of the alvear path (likewise lamellar) might synapse the basket cells to form inhibitory lines coincident with these relationships. Likewise the (intrinsic and extrinsic) subpyramidal inhibitory and and (intrinsic and extrinsic) suprapyramidal excitory lines could interact with one another in contrasignal patterns. It is of some interest that perforant fibers bifurcate to split or redouble time over the CA_{3-4} pyramids' apicodendrites (is this because of the interhippocampal fibers?); similar intrahippocampal splits or folds occur elsewhere, eg CA_{1-2} pyramidal axons (for clashing of wavefronts? note such an arrangement of successive bifurcations or just successive contradromic fibers could repeatedly confront a pattern with itself, as in an echo chamber, or cause reverberation—in fact, the inhibitory interlinkage and the precise timing could cause an inhibitory autofiltering and an inhibitory or resonant stationarity of spatiotemporal components in proportion to their autocomplementarity or orderliness, and a hierarchic backup of patterns in proportion to their generality; of course, this gossamery speculation needs further thought). Now, superimposed on these systems are the longitudinal axis and (intrinsic and extrinsic) fibers of the hippocampus and parahippocampus, wherein interesting orthogonal and anorthogonal interactions are also sketchable, including



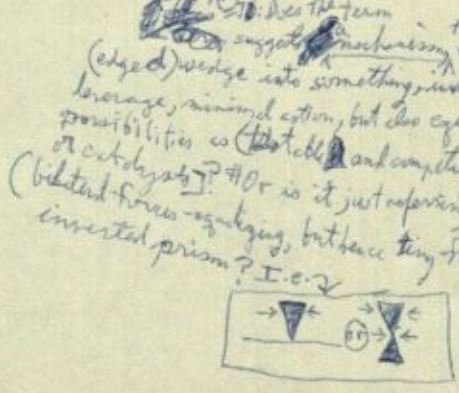
the longitudinal interlamellar system of afferents from the neocortex, paleocortex, and subcortices. Too, the distribution of the fimbrial afferents and efferents, and perforant trifurcation (and other multifurcations), must be considered in the light of these diachronic and orthogonal ideas.

The very interesting fact about any tissue where the general fibers enter in limited orthogonal parallel streams is that lateral inhibition is enabled to take place (in the hippocampus) in one direction (anterior inhibition) so as to form serial plana, thus there is an impedant wall, a dense temporal immurement or stacking of moments, and a cascade (yet one which meanwhile may be invariantly sampled over); this temporal gradient would be unique to this type of structure.

The septohippocampal theta rhythm could serve to affect certain hippocampofugal termini or block certain hippocampopetals (eg neocortic familiarity from interferring with reorienting behavior); its slowness (relative to neocorticofugal EEG) could represent less hippocampal output or none if representing basket-caused inhibition (say due to slowness of rhythm inevitably engaging perfect echoance or synchrony (hence the synchrony?!) of inhibitors with excitors whereas high frequency or noise (in any brain structures) would prevent this simple normal 'standing' inhibitory circulation (or the average strength of the inhibitors in membrane polarity)).

An idea is that, eg, the perforant fibers would be sampling or representing a great variety of neocortic activity and that patterns in this activity would have whole cells (apicodendrites) to themselves so that salient patterns in the activity would takeover and fire the cell best concentrating them, and thereby might suppress other cells and patterns in a self-emphatic competition and simultaneously perpetuate themselves in relatively uninhibited, disinhibited, potentiated, cyclic, and chronic activity of these representative cells.

By way of example, it might be suggested that axons descending from hippocampal pyramids to subcortices might inhibit drives to decrease interest in a former or sustained (but now, ipso facto, habituated) stimulus or activity, &r excite drives to sustain and intensify either interest in or memory of that former or sustained interest or activity (or some hippocampally processed component thereof). (In this connexion, the increase of the Papez circuit in man could have served an increased specificity of the thus-differentiable 'drives'.) The repeated inversions in the hippocampal subfields (or continuum) could serve to give random-access relations to the different subcortic nuclei (involving very different properties in the brain, eg opposite drives, feelings, and functions) projected by the different hippocampal subfields, and perhaps to orthogonally spread these different drives, functions, feelings, and spaces against one another ("cuneiform equalization").



EVOLUTION