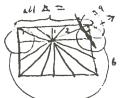


# A PROPOGED COMPUTER SIMULATION OF STRIATE NEURONAL MONOCELLULAR & MULTICELLULAR RECOGNITION OF FORMAL EVENTS

Pat Gunkel

I recently worked out in light detail two antithetic models for intercellular brain processes, the one being a justification for W. R. Adey's belief that extracellular slow-wave events or P. Weiss' fields could be most important in the brain, the other, demonstrated here, that action potentials may be sufficient, and I decided there is at least a 20% possibility that artificial brains could be constructed out of a simple neuronology whereby neuronogramic ontogeny is comprehensible on a monocellular basis & all sets of connected neurons may be simulated by macro-operationally predictable regular collections of functionally & initially reduplicated cells. I have a number of models of the brain & the neuron that are compatible with this statement, so what follows is flexible.

Work out on computer as linear formula for sum over form taken as excitory edge & solid continuous & discontinuous for inhibitory-excitory annular granular field for additive & distance-diminishing value for single cell at various loci & for regular groups of cells (eg approximations of interaction). Later sets of cells sensitive to various particular formulae might be tested, including over-time phenomena (eg habituative, regenerative, degenerative, cyclicity, ambivalent formulae, progenerative) & various "learnt" patterns of individual cell formulae (eg absolute or recursive), & variations with centricity, motion (steady, exponential, complex, discontinuous), boundary definition (eg fuzzy, ragged, extreme), duration, intensity variation (per cell, per distance, per time, per time load), size, orientation, & distortion for all sorts or the 'possible' or 'natural' set of forms & with plurality of 'objects' (varied, multiple, serial, intersective, self-generative, textured). The aim is to get differentiable (recognitionable) commonalities out of a natural or impressive universe of events. Intelligence could evolve by polymodal sensorimotor correlation or by criterial variation in reinforcements (eg biased selective repetition or intrarepetitive & interrepetitive differentiation).



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d. Slower "deceleration" of top in "faster" stop & "faster" "deceleration" of right as "slower" stop, both stops really simultaneous, addition =  $(d. \cdot b^2 & 4 & 8^2) = (\Delta & \Delta = \Delta)$ ...

Multicellular distal spread (see above) could be curtailed for a distal-mosaic mediation. Or-&, hysteretic distal spread & interaction could occur. Esp for external v internal formulae ( Solution). Such formulae might be especially interesting for textural & detailous recognition, development, & interaction eg cross-temporal (various temporal rules are possible, including accretion, interference, differentiation, isolation, geometry, & anticipatory 'active' processes & systematism).

In a "ofter" corter, confilm as and contradiction believed I be in to have an in general work at interests \$1/v to react that surgen reurongen given back at interests \$1/v to react with subsequent insteading, resents who I made I me down in to convert + neurospan its is party purely reactive in the converts of a convert and a simulate Diple out put, in residually exercusors who me coll may, in a complex context a differently stimulated colle, may react peculiarly to a recurred formula - where I take start carriet. a recursio case + strolo stroly is integrally with further experien - I'm still convened + thing must works in a netlet wherein a bressen tree way and Biographer or per or or of should be possible to the in second could collection fulls, in culture + then to imprise mellic bertrock of mile to prosens solt -10°s fin theses. controlly (by math roly) water by something and a controlly (by math roly) (66, 126 will oll whoths, spenfer cells are recovering to the her her and a standard of the st Snow, rotate + andet be beent, returned trains a ket there, history is recovered compare histor ( 29 gurdilebut recessary of any, how fust bouring occurs in the fift of limitations in call. in cellular learning & in the hadrend that tos such, I mener + sense finny it, imailar justille For recordition; Frobability Frall nancy sop in it related to unclegant single cell a suplist set, socilar changes inclusions that he is straight integrations Single anageant, for carried personation (See taparel fate Cabe exploration) for separation, capacity, reproveding, recepting, separate or et.). orange storage, delay, the ret.).

#### VISUAL PERCEPTION ... Pat Gunkel

Regardless of whether eye motions or fixations have any importance or more importance than the other in the development and operation of visual recognition, with variable importance of attentional mechanisms, their result will be a differential identification of cells falling at points mixed in a webwork of 'structural' interconnections, serving sorting, whereby there will arise in this tissue a complex discrimination of patterns as follows. Connexions and/or cells with time and space coincidental interconnections more parallel to movement than others will have an extra chance for stimulation or simply will have more stimulation than less parallel and/or congruent ones; likewise for parallelisms and congruences of cells in the relative absence of eye motion or rather in intervals between motions, to changes in orientation.

Note how in Donald Hebb's way a 'fine' network would be set up, employing phase sequences and cell assemblies or their real equivalent, based on coincidences, for the movement-related sorting of lines, so that a figure at any one moment would engage the total mass of past linkages, including some intensive processes that would be simplifying and transcendental; including approximations between different forms or possibilities -- eg selectively -- in the generalization of forms into each other and higher conceptual development -- the process involving simultaneous learning between all the cells; processes of fatigue or habituation would encourage this generalization or rather static

recognition.

The mechanism of motor control is perhaps not overly important, at least initially, when the tissue may sort patterns by passive participation in movements; the latter process to be called "crinkling". I am not sure what is a suitable explanation for the punctal and linear close rematching or repetition of motions over same figures, but note the concemitant prolonged fixation of the head and object during the eye motions, and the fact that ontogeny may go from simple coordinate fixation here to complex mechanisms of (equivalent, &c) recoordination.

If some cells respond and consolidate in the presence of lines at particular orientations or as particular figures, merely empirically (remembering that the entire tissue will in this way develop large sets of differentiations), then, by the background firing of these cells as well as by the coincidental textures of experience, sets will precipitate from and cluster about these sets as other simple and more complex examples, which may or may not then inhibit the prior sets; or complex sets may crossinhibitorily isolate, develop, and complicate themselves; or other things. But speaking merely positively and cumulatively, the differential frequencies and intercorrelated firings of all the tissual cells will an ever greater diversity of representations, fittings, and examples of experiences or visual forms. There may be a natural process of convergence so that structural variations between cells will gradually enlarge and, shared between all the cells, become "meta" or independent of various orders of changes, eg in orientation or size; the reason for this might be simply inhibition of similarities or descriptions of variations occurring incrementally.

If at first the recognition of a figure requires the 'scanning' of all or part of the figure, eventually this requirement may be superseded by the evolution of a set of cells with interconnective experience of coincidences of active movements in the presence of passive figural relations; these cells may in effect 'anticipate' the effect of the movement and involve habituation to the consequences of movement specific to the anticipated figure or figure within texture. Likewise may redundancies between orientations develop. The incorporation and generalization produced in the retirement of these requirements will liberate the tissue to other purposes or further progression.

Again, gradual successive development of plastic or temporarily plastic tissues may be the secret of human intelligence, including the possibility of some characteristically human precedent stabilization of lower tissues serving the contrastive and subdifferentiative organization of higher tissues, or their accentuated complexity.

The patterns recognized by cells in the 3 occipital areas could then be inapparent in microelectrodal work, which would deal with irrelevant fragments.

The process I suggested above would be one of "anticipatory inhibition" or "anticipatory habituation" or "proactive generalization", and is overlooked in neuroscientific discussions.

It is possible the wealth of cells with their possibilities would develop ever more elaborate and proactive generalizations to finally reach "saturation", along various dimensions of order, and stop the "explorations".

It is just possible that some sort of palimpsestic memory is involved in say lower areas so that over weeks of radical change or deprivation a process of partial replacement of recognitional properties or their intensities would occur. In any case, both recent-centered and old-centered 'screens' could be valuable, explanatory, essential, or factual variously in the nervous system, containing mass traces of very odd form.

One can imagine a reverse-habituational mechanism whereby local habituation would create a vacuum which would cause oculomotor centering so that the eyes would continually run to relatively unhabituated but eccentric areas or do this peripherally. Or another one, in which previous habituation would be differentiation or the very creation of novelty over unhabituated areas, so that familiar lines, figures, &c would later be recentered.

Returning to the initial idea of this paper. The cells would continually be seeking for what is definite but relatively different, retaining at the same time in ever more complex forms simpler recognitions as interactions between the cells simultaneously complexifying their different patterns or sets of patterns per cell, eg with the habituations becoming 'finer' units between cells or, overtly, actually more demanding.

#### HIPPCAMPAL FUOTNOTE

All that need be considered in the case of the hippocampus is that it is a self-reexciting tissue such that any or special desynchronizations will proportionately expand the time necessary for its synchronization (and likewise applied tissues and fibers); the autoexcitation may be endo- and/or exogenous; formerly the hippocampus may have served olfatory and/or affective prolongation, serving in many relatively and/or absolutely expanded motor, affective, is sensory, prolongation; in addition to firming some/all memories, diachronic mixture, equivalence, and chronocorrelation might have greatened, and in fact the prefrontal, accortex may have served peculiar (late?) temporal (and thus general) egalitarianism and morals (as in stories).

## THE INTERFERENCE THEORY OF THE MIND REVISITED Pat Gunkel

The cause of the visit is my belief that an analogous transfer of patterns is the final explanation of the mind, its memory and thought.

Interference has had a long history of adherents who, however, for some reason have yet to convince others and themselves that they are right. Perhaps the reason lies in the terms in which the idea has been couched, variously ill-defined, mischosen, overstretched, or misrepresented. Take the suggestion of waves. There is no necessary or even probable ground for assuming that the brain "interferes" its processes by the agent of waves, certainly not the simple but particular waves that move on water with such grace. And "interference" in what sense, for certainly there can be many? Many other spurious problems have doubtless arisen and taken hold because such terms have been misconstrued. All this said, I think the real problem has been a hesitancy of imaginative enthusiasm for the power of the concepts, loosely but adequately joined to the terms, has been there all along, and the real idea intended was and is as follows.

The relations and structure of a figure may be transferred to points as a series in time approximating a particular shape, having been represented by a particular series, in the past, so the weakness of any single point may be undistortedly compensated by the simultaneous reception of the shape by a maniness of points comprising a tissue. The contribution to the single points will consist in a confluence of triggered pulses down the fibers of a so-called representative configuration, in an instance when all such configurations may be isomorphic, in which case a division of theories is possible. It may or may not be that the spacial extension and maniness of the representative configurations will draw the texture of the impression out into a consensual average, and the recognition will occur via the average. The "spatial-frequential" properties, then, of sensa will be analyzed by the vergent rather than lateral propagation of the information. Tertiary cells may then assimilate and compound the seperate data of the foregoing cells and arrive in time, through this continuum, at skilled recognition. It is conceivable one function of the oculokineses might be simply the random diversification of influx to prevent the evolution of only-narrow constructs and to favor the multidimensional or panconfigurational average; likewise may many mechanisms throughout the nervous system have the irritative effect of diversifying orientation and experience for the sake of generalization and one could theoretically imagine the fornix or Papez (has the cingulohippocampal perforation increased therefore and especially in man?) circuit recently having increased the incidence and degree of dissatisfaction and the mobility of attention.

If a brain did this it might have special interest in certain types of circuitry and, and hence, cells-eg counting, measuring, resonant (mnemic), &c cells. The horizontal spread of intrinsic fibers in visual striae might serve some unit of figural transformation (interferential transfiguration).

#### SCANSOHIAL NOOGENES IS Pat Gunkel

The nature-nurture dichotomy is not only unfortunate in that it leads to either-or, all-or-none, and categorial thinking in an organic process of development for the environment includes much more than animate and inanimate culture, the environment of the body and nervous system, ambiguous innatenesses, and the education of family, school, and society that is so obvious grossly. When deciding (likewise) the role of insight, of 'pure' cognition, of orthogenesis divorced from tales of perception, &c no small amount of caution will fairly demonstrate the subtlety, constancy, diversity, excellence, quantity, adequacy, simplicity, linkage, and care of natural instruction meaning illustration for the child is immersed in a living miracle, the plainest experience and the most confined upbringing is faithful to all the types of order and hence their interrelation, and no man has studied every bit of the youthful record and pondered it as deeply as he then would have had to-relative to the attention this has actually been given no doubt it is almost as if nature had been arranged to teach a mind by sheer memory. Why then is there such hardship in how high the minds of animals may soar and what else may be said in view of the possibility that I have overstated my case? (In passing from the above remember as well that nature is surely very delusory.)

The first question is not to be directly discussed here as is the second. I imagine that the miracle of nature may be supplemented by a progress of mental habits such that the mind relies on various signs, operations, and arrangements until they give out, having meanwhile profited, and then adopts others in their stead, additionally, or complementarily. Because of the crossing of many roads and the nature of the synthesis of mental guides the process is not to be named multivious. One can imagine a combination of such exhaustion and wandering to or hunting down the "miraculous" alternatives in the eventuation of progress. Because of the parallel, asymptotic, regenerative, nonsimultaneous, and abortive nature of the process, its great density and subtlety, there is no particular reason why it should seem discontinuous or apparent on the outside. All this and the bases of substitution would make for a hierarchic ascent of intellect and hence I call this "climbing". Climbing would go on all the time and in the most trivial way, from the most elementary mental elements to the most complex, all mental elements being ever refined; when in active service as criteria or to the degree therein I call this emphasization "dramatization". Its basis deserves its own analysis, though it may not in fact deserve the status of a special concept.

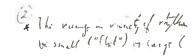
Hence to a point it may do to rely in perception on simple reversible, irreversible, linear, uninomial, discrete, continuous, isolate, simple, few, &c percepts and concepts but 'eventually' these may fail, be abandoned or replaced by complex terms in the enlargement of intellect and yet these terms may be almost or quite literally provided by representations in the environment whose memory may be isolated and generalized over many processes as an explorable mental operation. Eg the division or focus of attention on the capacity and variable content of two heteromorphic containers poring water into each other may lead to the direct impression of correlation in various notions of measurement and conservation and its dramatization in a scansorial switch, or to the retirement of various ideas of time, unidimensionality, independence, immeasure, &c. The equation of this correlation to other events in experience, horizontally, could then exemplify a lower level process, an automation, saturating memory and further experience in a mental revolution; theoretically such a concept could induce the mind to find higher concepts with ease. The emphasis in horizontal search might be more something as vertically and horizontally similar in parameters and parametric values as possible; I am unable to suggest the general way in which this spread would occur despite the importance of such a description.

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Neuropsychologists have recently become rather aware of the great and special importance of habituation, alternation, multifunctionality, self-control, the ability to do, consider, feel, and recall many things at once (especially things as different, incompatible, and complex as possible), self-suppression, manipulation symbolization, phasing, subtle handling, epoche, suspension of action, redirection of feeling, emotional self-manipulation, control of expression, and other abilities in the explanation of higher intellect and in the intellectual uniqueness of man, and they are presently unraveling their neurology. How important and decisive these things are to climbing is unsure. But in lower animals, animals approaching human intelligence, human children and ill the limitations in and springing from these things are obvious, eg children before and within noetic stages may be seen in handling the problems of these stages to equivocate in the face of multivalence, confuse multiplexity, to confuse form and content, idea and thing, process and thing to be unable to see, create, remember, operate, and act upon alternatives or a landscape and space of alternatives and operations. It is perhaps not without great signifigance that an adult has lost something of the basis or degree of childhood me educability and flexibility: the adult mind may be a very peculiar mind and not real In any event, it may well be that the power of the human mind rests on its ability, paradoxically, to exclude ideas 'and activities' of various parts or of all the mind, to suppress memory, action, reaction, and feeling (as well as on the abilit to get bored), and perhaps an ability to center on or regress to very elementary or unusual things, as in a prolongation of curiosity upon the details of a scene or in a selective disattention to parts of the scene, the real benefit of which would only become apparent in a gradual tailoring, building, and cumulating of mind. (Obiter, I have often wondered whether the stabilization or contentment of lower centers has not at the human stage become extraordinarily dependent upon activities in so-called association cortices.)

2 The range in variety of rhythms could be small ("flat") or large ("deep").

3 You don't want too much similarity so you have some subcategory, which causes inclusion; inclusive



A CORTIC MECHANISM Pat Gunkel

A cortic mechanism can be envisaged in the following way. The compresence of inhibitory cells would cause a simultaneous process of preferential convergence and divergence or condivergence. This is instead of or in addition to a purely excitory or inhibitory scheme with general relaxation and possibly equilibria. Insistent condivergence can of course 'increase or decrease' the engram, depending on the nature of continued input. Condivergence may however serve a scheme of progressive specification. With a sustained input leading to assimilative identity of the cells, depending on the nature of the sustentation, at a certain effective cross-over point (imaginarily) the rhythmic identity of cells (and the saturation of background rhythms) might equal or trigger the antirhythmic, dysrhythmic, and arhythmic antiisocyclic counteraction of the inhibitory cells, or the trigger or flux of positive excitory variations (which could then crossreact in limitary or alimitary essential or superficial degenerations), antisaturations, or saturational triggers. A consequence might which follows be that the cells would develop new or phasally compatible rhythms, the engrammic rhythm still in capture, and able to react with subsequent input. From another perspective, the removal, change, or slackening of the input as its cellular influence, could elicit a resurgence of the old or a series of rhythms, eg in the sense that some harmonic mode was formerly instituted or made a degree of freedom of the system. In one way, a circular recording tape can be imagined capable of receiving many superposed or intercalate rhythms, so that maximally various rhythms could be at play in the same cells with a practical level of interference; or various sorts of generalization could be postulated to proceed from modes of productive interference.

The upshot of these schemes could be a functional hierarchicalization of experience, a reflexive employment of universals in the discrimination of particulars, and an organic interrelation of the universals with the progressive details of (universally seen) experience. Across time and across and within tissues a gradation of relevancies would appear, on the basis of a probabilistic calculus, sorting generals from details, and empowering the

probabilistic calculus, sorting generals from details, and empowering the generals condivergently, ie the generals would be specific in proportion to the conflicting details, or be a measure of the conflict.

Let us say the cells responded to lines, as seems true in area 17. Then the orientation of these lines would be favored because infinite orientations would elicit lateral inhibition of effectual homogeneity, but the lack of a bias or the effect of homogeneity might insure variety; thus a compromise is possible with specificity amid generality (the in 17 a simpler explanation of the columnar grouping offers itself in the logic of these ideas). The interactions produced by interareal dispersion might then disfavor the lines by their identical superimposition or sustained recognition, (but perhaps left with these elements) bringing lateroinhibitory generation of condivergent of configurations. It can thus be visualized that the striate cortex transforms configurations. It can thus be visualized that the striate cortex transforms visual experience into points as components of area 18, the points becoming the visual experience into points as components of lines, with a retention of scalar intersections of lines, the scale universal and the lines innumerable. An analogous transformation in the transfer to area 18 would carry lines into configurations (investigatory "corners") in condivergent engrams.

Assume: visual field generalization causes hierarchization.

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Then surfaces would be inhibitably exclusable with lines ok and better than points. Does the lateral geniculate nucleus serve this superposition (eg mildly but manifestly at 17)? Such orientation could occur in

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#### A CORTIC MECHANISM AT HIGHER PLANES Pat Gunkel

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when the lang? Charles Gross has found cells in monkey inferotemporal cortex with preferred " a willing to the warm from stimuli that are as highly complex as familiar classes of objects, such as the outline of a hand or tree. Almost everything remains to be investigated about these responses and this level of the brain, but these results are relatable to ideas about condivergence and intertransformation in ideomorphosis. They simply fit an explanation of the brain. Let us speculate.

Analogously to the sets of cells in occipital areas postulated to transfer points into higher linear contextures, as values on continua, and then the lines themselves into figural contextures, and so on, areas as high as area 37 or occipitotemporalis may since have transferred the figures of preceding areas into classes or cases of familiar objects. Facial preference of a percentage of cells in 37 could simply reflect the frequency, common resemblance, importance and attendedness of facial form. The prominence or (if true) singularity of a facial preference may belie, in a sense, unfathomably complex, diffuse, and interrelated intracategoric, intercategoric, partial, and occasional responses of the identified cells. The common response of the tissue to objects will contain detailous comparison and specification, and will be the full basis of perception, rather than some trivial "gnostic units". Faces, trees, and hands will be compared together. All this is a result of condivergence.

David Bear, Ideo Sasaki, and Frank Ervin have evidently shown that fieldsshapes-contours in area 17 in response to light points fluctuate at least over minutes (tho this investigation, too, has everywhere to go). Detail and basis are unclear, but cell mass and perceptual flexibility spring to mind. Surely higher cells similarly fluctuate. Such fluctuations may identify a certain supplementary means for ideomorphotic condivergence, or may simply manifest

It can be imagined that the reminiscences Wilder Penfield induced in men by temporolobe stimulation, with a cinemic replay of past episodes, is rather analogous with Charles Gross' figures, because I think that the repeated interareal dispersions would at some stage cause a level of intercorrelation such that sensa would be resolved into the detail proper to such elicitations and synaptic transactions of the tissue would be primarily concerned with such correlative totality of impression: wast numbers of experiences would have been intercorrelated in vast numbers of ways and the synchronic modes of the tissue at this point might well have to do with classes and cases of objects

Nevertheless it is possible that details are left behind or at least sought at lower levels under transcendental levels.

To retrace a path. A point in the visual field will lie in relation to all the dipoles and linear constructions of the occipital lobe's simple and "higher" cells. The myriad of any-angle orientations of cells here will have a favored group of cells whose fields fall circumferentially across the point. This radial and circumferential set will stand in relation to other sensa. Its diverse cellular membership will innumerably configure the point. The stimulation in these cells from that point will specify its coordinates, despite the linear properties of their fields. Possibly the larger stimulations of lines will stand in linear or adequate quantitative relation to mere points. The matter is inessential, since theoretically the transformation need occasion no distortion, ie unreal deemphasis of points. Yet one has here apparently a very elegant mechanism for incorporating 'mere dust' of points into the figures of forms, for a second transformation can render lines into figures.

To put it crudely, at the level of figures points will be contained by the ability

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of figures to 'rotate' through points or to 'return through the coordinate system or corridor of the figures and lines to points, accompanying the diversity along the way. At the same time this tissue may generalize structure in time and so recognize patterns of movement, such as those relating to the positioning of the inday the eyes, body, and external forms inter se.

If we assume that cells in this way represent figures and then think of the figures undergoing superposition through a further interareal or intraareal dispersion, by this time geometric objects should begin to convert into classes of descip objects of greater detail and particularity and generalization concern the many him. objects of a scene. Be it noted here I see no reason for sharp or true jumps in these progressions, and the advantage of further areas I see to lie in the merger of senses, the division of attention, a hierarchy of effectors, the ontogenetic seperation of issues, the freedom of further operations, the imposition of functional peculiarities, the isolation of activities, and quantitative extension.

A point might be made by the hypercomplex cells. Their preference for corners is easy to explain by one of the mechanisms of condivergence (including simply monosynaptic inhibition) operating after a dispersion between areas 17 and 18, the corners being functional components of figures , but note the cells display what are in effect symbols, being functional or virtual reductions of visual experience.

> 1 These higher planes or 'successive areas' later in ontogeny could be great for heightening mind, because the lower precrystallized properties would now be drawn on as stages; therefore, a particular ordering of ontogeny could have given man his unique intelligence. The gradual development of Wernicke's area could thus provide a unique hierarchic continuum

#### THE PROBLEMS OF RECOGNITION AND THEIR SUPERANGUATION Pat Gunkel

It is time to ask whether the complexities introduced into thought on vision in the guise of metasize, metaintensity, metalocation, metaorientation, metaclarity, metastability, metavariety, metapopulation, metacolor, metasetting, REALISTOF metamotion, and metatime are fraudulent because for all their transformations neural tissue would still have at its disposal sufficient general regularities for easy and indifferent universalization, for it is constantly forgotten that mental development involves the immensities of detail, time, neural elements, action, and intrication under whose subtleties the transformations may be nothing. If a figure rotates or jumps orientations, appears discontinuously, likewise changes size, location, and structure, are there any invariances, salvations, or schemes therefor? It is easy to imagine that the tissue preserves spatial and temporal coordinations, as elsewhere shown, if all points on the figure smoothly irradiated a common internal or external 'center' or all points as centers the resultant waveform or pericentral interaction could extract symmetries (over and indifferent to size, and partially or casally structure and location) (indeed eg if all the points acted as centers their mutual eccentricity could preserve spacial coordination and even serve recognition over deformation 'perspectivally'). The "schemes" may include nondisclosure, saltation, retrospection, &c. I have often shown how a few elements may intersect in a multidimensional matrix to great specificity. There is the infinite improbability of error and the infinitization of probability. Even if a prediction seems low-probability, features of that prediction involve their own and combinatory probability. Types of random sampling (perhaps "learnt" and "installed") may arise in perception. If superficially (or finally!) unlike objects succeed one another at all or some locations, various languages or codes may arise throughout the tissue at and about and as to those locations, as in the sense that simple-form perception may occur at lower neural levels, the higher levels drawing on the (later reunified) melodic variations within each lower language or interrelation; these variations, convergent at the higher levels, may there create 'free' combinatory matrices of great specific cuniversality. Suppose that all the details or languages lowermore do their best to fend off decision or convergent unity, so that in order for the total tissue to be effective there must be great choice and consensus in the lower languages, then (eg through temporal sharpness and the choiceequilibratory nature of the array) (eg reticular) great reinforcement may at once select a massive (perhaps arbitrary) pattern for intertransformation and 'random hierarchicalization'. (Note the eg-alpha encephalographic mode, which equilibrium could foster such patternment of all cells that they, in innumerable orders, insistently and consecutively intercorrelate and return to that mode; thus they might filter the order within afference and build their cyclic and transmissive architecture as harmonics of that order and its typology; by one aspect of condivergence, tissue and feature space would also unify). If lower levels preserve spacial, temporal, and elementary correlations, higher levels may refer thereto and depart therefrom (eg some pulvinar cells, presumably like cortices, objectify independent of location) for correspondences emergent despite dispersions (note some 17 efferents to area 19, which could map or serve the ethereal 19); one can imagine objective matrices in 19 yielding 'infinite' specificities for matric reselection or synthesis on the basis of an imposed retinal map in its local properties across such a higher area. Note the equivalence of rotation and size: sizes or details of rotations are infinite (if smallest points rotate, then or also) progressively larger, spatial relations are preserved); important?

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One could imagine a tissue doing Tourier analysis of spatial, temporal, and qualitative frequency with great (even infinite) bandwidths and employing random continua for the preferential sortation of possibilities, wherein larger and more obvious (or selectably so, as a manifestation of equipotentiality and ambivalence) things (as categories of possibilities, as in "the class of classes") would so figure in mental behavior. Such things as the infinity of orientations of impulses needn't be troublesome for such reasons as stablelike paths, regular repetitions, summation of sources, random continua, and worldly order. This analysis could occur intracolumnarly, intercolumnarly, holareally, or interareally. It simplifies visualization of modes of entrance of superficially grossly dissimilar but, usefully, or importantly, correlable data, as in corticocortic architecture, corticosubcortic connexion, and centrifugal control of afference (which control could foster a tremendous phylogenic control of attention and resultant abstraction?) The EEG could be the instrument of holareal or macrareal Tourier analysis, eg within the components of the evoked potential the tissue could quickly stabilize and normalize its response to afference and then or at once pass penetrant, regemerative, or facilitated eg-few pulses across the tissue for the analysis; or unit shifts of phase as to the EEG of the next area could operate. One can imagine a tissue developed (through self-familiarization) as a potential Fourier scheme, ie various possibilities would be open to pulses and the tissue would be ontogenically prepared.

My "rat allocative boxes" idea could operate at this scale, but refinements are appropriate (see elsewhere).

As to metaclarity, metastability, and metavariety, the operation of variably constitutable random continua is important to recall, as also the ecphoric role of detail, the importance of spatiotemporal circumstance, the occasions of any features and their assemblage, and hypercorrelative intraclassification, interclassification, and/or telecclassification (resp the first may be pictured as an irradiation from a point with a local or continual:circular peripheral submodification or even attachment (in these three cases the irradiation may (discal) or may not (annular) involve central recreation and continual reradiation; also there may (centrosymmetry) or may not (episymmetry) be partial or total central or central recorrelation) serially, the second has three possibilities (cooperative adjustment of classifications, partial or total reciprocal emergence of classes by (variously timeable) some or all classes being correlated with some or all classes, and additional classes), the third suggests some degree of fullness and completeness of inter and/or intraclassication; the second may be entertained as a Sinic river whose threads eternally decussate, the third Sivaistically, the first as a tree). But above all, imagine causes for seperating, delimiting, developing, and distinguishing between similar or nearly overlapping deformations, varieties, and genera, remember that some reversibility is possible and that there may be great multiplication and complication (eg interdivision) of views (interpretive universes), and remember that criteria (by selection and by these things) may be arbitrarily and abstractly sharp. The stream of consciousness and the instantaneous setting (as the general meaning or purpose, or as to detailous cues) (as in the texture, scale, polythematicity, coordinate mode, manifestations of sources of deformity, obscurity, incompleteness, and variety) is a puissant aid in these recognitions. In the absence of presumptions or preparations the "orienting" eye of the mind may find and pair special or any details in extreme magnifications and accelerations; hypotheses (in great, random-continual numbers) may be instantly tested (these hypotheses may be of such kind that they admit of multiple or most-numerous determinations); this resolution may be occasional, subconscious, and normative (ie having some arbitrary norm about how much must be seen, understood, and why).

The "allocative boxes" idea may be introduced here. On the basis of long experience the mind may acquire the equivalent of lands with many mansions with many rooms with many objects with many details. Along the way, taking the rooms as an example, a stereotypic room can be imagined emerging in ontogeny to which all other rooms may be variants. Any room, however, may be employed in recognition of a new room by an automatic subjective confrontation of the old room with one one is in. There may be a typical amount of detail in this room (even some cumulation of detail in arbitrary phantasmal density) and the disposal transformations of experience (such as translations, manipulations, bodily perspectives, laborings) make it unimportant (as may also the multiplicity of experienced rooms) where exactly the contents or structure of the room are located (to the degree and in the way that this is so). Experiential rules and laws of nesting, alignment, dis/continuity, topology, meter, color and other qualitative spectra and somehow related sets, volume, purpose, texture, lighting, mutual and general arrangement, 'censuses', &c interrelate the two rooms. The point is that within the brain there may be an image or great populations of images (the mind a veritable architecture of images) in which new images held up to the brain may be mirrored, resolved, compared. If just one room, both for analysis and recognition (and they are related), then that room may be homogeneously and heterogeneously crosscorrelated with an afferent room (drawing on the above arguments about matrices and the "orienting eye", enormous and sufficient (eg semiconscious) information might be drawn from the scene thus (it could be this process continues, say unconsciously, into the details of the room in order to maximize accuracy of response and this identification, and serve the following divergent stream of consciousness and experience, as well, perhaps, to modify the "universal image"; if there are many ecphoric rooms, these might be treated serially, parallely, or interactively)). But it is reasonable that many, all, universal, imaginary, or random-continual rooms may receive comparison, as a diamond breaks into further crystals; then dissonances and consonances may be integrated in next cortic areas as a scene possessing both unity (meaning) and detail, internal and external homogeneity and heterogeneity; the brain may progressively acquire this ability to embed and translate experience. As to translation, various explanations and phenomena offer themselves. Progressive generalization may occur by the ease and complexity of imbedment favoring the degree and importance of that progress and its figures; moreover, the progressive utilization of progress and the peculiarities of its domain may have its effect. Hypothetically, in ontogeny attention may first lie in simple objects and responses but later physiologically switch to autocosmic, behavioral, or apathetic complications (or fix a transition with imaginative activity growing enormously in the effective replacement of action and simple recognition; eg if objects are correlated into objects are correlated into objects, ad infinitum, then abstract classes and operations, as in analogy to movement, could appear if the brain is not satisfied with its response, but goes on analyzing its experience (which then becomes its life), intellect may arise (related to sensory centrifugals? is man early or esp later characterized by a deemphasis or even reduction of afference over relative or absolute persistent association?-by association area activity during, after, or independent of sensation and/or action and/or feeling?)). The "allocative boxes" idea was originally conceived to explain the acceleration of learning of any mazes in rats learning any mazes: it postulated that all the signs expressing the work of maze investigation became epitomized in codefined turns so that any maze became for the rat a series of homologous decision clusters, an internal operational structure so definite and lubricated (probabilities plain and

directive) that the rat's experience in each new maze would tend toward perfect remembrance and nonrepetition topologically; with the thought human memory and cognition might be analogous. If intra, inter, and teleoclassification (see above) obtain, these might work the murid scheme. As to Piaget's stages of child mental development, somethings indicate intrareal simplicity, regression, and interference obtain, so that even intrareal physical ontogenic spread might not suffice, at least in lower areas; but the fact that neurogeny is spread over Piaget's periods and even three decades in the case of successive development of successive cortices, combined with the above, could explain Piaget and intellectual development or accomplishment by the introduction of new tissues afar and seperately which could naturally acquire as their functions the more general and abstract differentiation of the classes of the earlier cortices and which could be logical, psychic, aesthetic, moral, motor, &c symmetry, reversal, fleeting imaginations, semiotics, transitivity, grammars, proposition, operations, hierarchy, inclusion, rigor, disciplined imaginations, development, indeterminacy, science, plans, purposes, codes, & which are civilization.

Metapopulation, the having of many shapes in the visual field, and the attendant problem of individualization are explicable. In life one always experiences many objects at once (indeed, as parts of each other, with the problem of detail conjoined) with sharp boundaries, with own perspectival systems, with backgrounds that are obvious, with independent tridimensional movement (including the like of 360° rotations and symmetries in the definite form of the body), with the ability to be fixed (thus 'abstracting' or dimensionalizing the idea of movement, with fixture contrastively identifying with the fixture of the object's internal structure), with marked discontinuities between objects in the extreme peculiarities of each object (color, texture, duration, situation), &c which could fuel the ontogeny of individualization and distinction. An ontogenic basis for Gestalt elements is also obvious, as for similarity and proximity grouping. Discontinuities are themselves objects and objects may form sets, as the lines of an object are in a way objects. We class figures objects more readily, they having relative continuity (vague objects are often projected). (Obiter, re supra, the fanciful projection of clouds may suggest how abstract intellect arose in man as the questioning, feeling, unstable, ambiguous, and/or brief and scattered phaneroscopy of shapes seen in association areas after their refraction by lower areas.) Indeed, objectivity often refers to recurrence. Coincidentally Hubel and Wiesel's cells are assigned the very features which distinguish objects: discontinuity, boundary, corners, surlocation, various independent motions, size, area (field or linear) (a curve may fit within, fit without, be analyzed by many lines and corners) (closure could be important because of spatial frequency, symmetries, its role in the analysis of obscurity, overlap, completeness, confinement, singularity, and depth, its indication of usual presentation, &c). Aside from individualization, the recognition of the compresence of many like and unlike objects or themes in a scene (and their analysis into disposition, location, inclusion, count, type, discontinuity, nature, complexity, and complexity of interrelation) may occur on the basis of theme (incidentally, students of ablation might ask themselves whether, in the absence of primary cortices, sensorimotor discontinuity and illocability occur independent of residual meaning or just awareness); of course, individualization, &c may afford an inestimable help to recognition of single or many objects, at least habitually.

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In cases like color metacolor, or the mere or easy recognition of other properties (eg form) despite changes, variegation, ambiguity, &c of some or any color, may simply occur through the presence of 'white' elements, redundancy and overlap, irrelevance of color, or the transference of eg-form between or beyond chromatic elements, despite retention of chromatic peculiarities; various types of circuital wiring could easily make these things obtain.

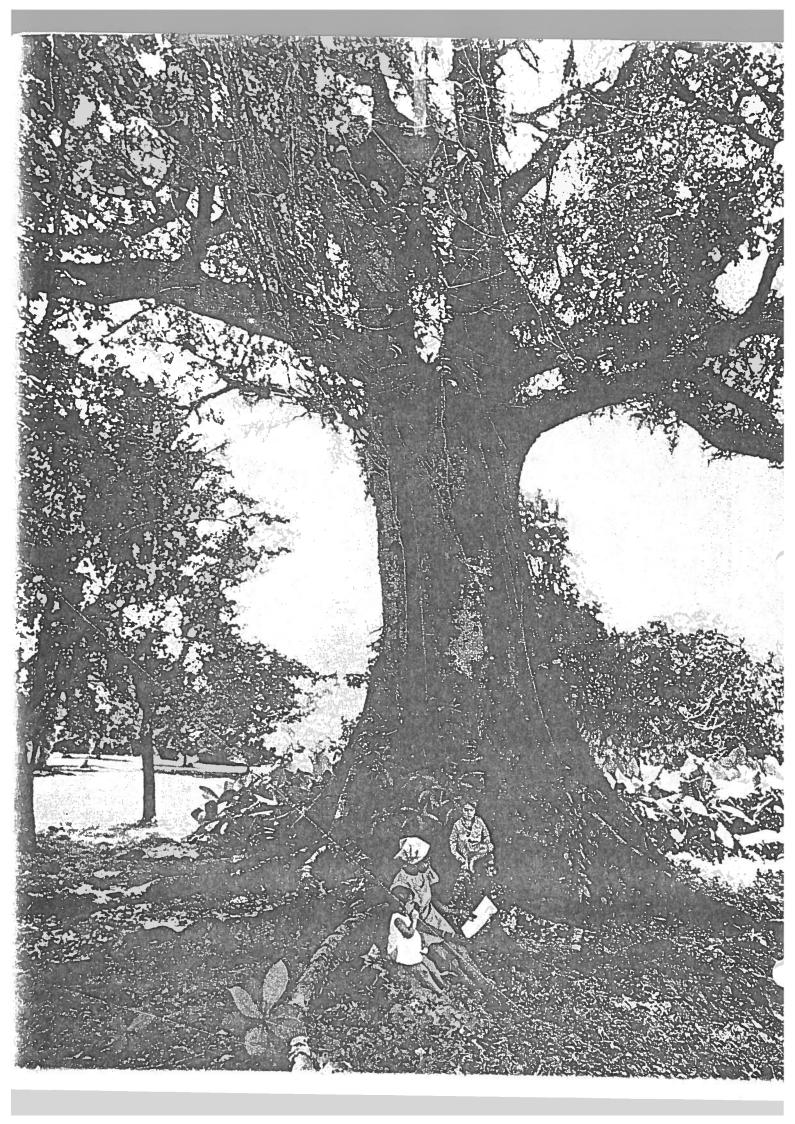
The family of processes that may or must be at work in individualization -centering, habituation, motion cum centering and recurrence, everything supra, such reinforcement as might occur by hand contact (realization of the idea of somesthetic closure could be tridimensionally as important as bidimensional visual closure; as at higher cases, the simplification of prior relations introduced by any quantumic realization of closure could be highly and generally motivating (the question of what becomes of such 'looped' energy, pattern, and arousal from economies is interesting generally: it could serve the consolidation of the change, cause the study of the change, reward the change, reward changes in general, reward rewards, reward some other area (as prefrontal inhibition); it would be interesting to know how the aborigine is lastingly impaired, but esp how intelligent and recoverable an adult or child raised truly aculturally or in the wild is (it is easy to think of irreversible and random bases for culture having gotten man here, if his intelligence is tralititious); re the progression of mental operations, see supra discussion of Piaget's stages and neurogeny, it is easy to account for pattern generalization by habituation (may some cortices, eg temporal, habituate less rapidly than others, perhaps for fastest habituation, thus explaining EEG differences, &c?) (and curiosity; singleness of attention may express the universal properties of tissual activities, but could be variable about a norm by eg reticular mechanisms, or could simply reflect the relative competition between areas and/or the 'irradiation' of problems or novelties; the nature of curiosity is both focal and motile, as in tracking (note that such tracking is capable of great intrinsic and intellectual progression; imagine the hippocampus gets images of total cortic activity and prolongs these over switches of attention and/or/&c 'minor' changes in the influx, then the sequences of attention might constitute conceptual units, perhaps for successive great interactions of present experience with old memory, and economic solutions proper to these time domains might assert themselves by the clothed arm of curiosity)); various methods and degrees of curiosity, thought, feeling, association, &c might be rewarded into fascinated life and differentiation, including reflexive operations for inductions about inductions (it is conceivable man's brain is really peculiarly organized for intellection); analogous to supra on the sensory cortices, the subdivision and expansion of the frontal cortex may have caused motor acts to be seen through and to have beginning in refractive hierarchicalizing clouds, and abstract, complex, longterm, and subtle acts to have arisen (likewise for cortices and drives)).

The following conversional scale may be of interest. It assumes each cortic neuron bursts every 100 sigma  $(\underline{n} \text{ spikes})$ .

TOTAL BURSTS BY VARIOUS AGES IN THE CHILD

neonate	* 0*
day	1016
month	3.1017
year	4.1018
3 years	1019
10 years	4.1019

Against each of these must be multiplied spikes per burst and branching of spikes (together maximum eg  $10^5$ ). Thus an extraordinary flux is available for transcending recognitional problems.



order (akin to Latin ordiri to lay the warp, begin to weave, begin, and perhaps to Greek arariskein to filt together, fashion, suit -

#### ORDER IN EXPERIENCE Pat Gunkel

the enginetion and avolution of ments (powerful, conceptud, cognitive informs betweeners) by affections largely hetera s this consultations, it of war The view of the world overabounds in order and it is this conspicuous and insistent order which I believe is responsible for the successof any nervous reprint system that we see. So the operations of intelligence are really the fittings of this material. I considered and dubbed this geocamptic stoichiogeny. If we disintegrated the world and let it begin over it is very likely the history which would ensue would issue a world much like our own, despite the apparent elementariness of the ashes and despite large historic dissimilarities, so that & something like a geomorphology is inherent in the elements of the world. More curious still, if one examines the face of either world it will be found that it is an extraordinary population of analogous situations or microcosms, if you will. Setting out on an antipodal voyage one would be surprised to find that no place in the world or in time forsakes these rules, analogies, and convergences. Likewise the history and eventuality of all men are delemorphous. Partly for internal reasons and partly, on the other hand, because of external and sensory order. Partly because of the order of our constitution and partly because of the order of sensory influx. By geocamptic stoichiogeny I mean that the elements that arise in mind as mental events are trivial transformations of external elements and events and that in each man we see but the order of

A list that I have already made of high classes of order within the world, and thus within experience, now calls for explanation and exemplification and first I undertake its exemplification by its application to a picture before

The elements of order in experience embrace the following, stated adjectivally with pictorial comparisons accompanying each item where appropriate.

(1) RECURRENT. An event or object which has occurred tends to recur again, in some sense, if just in the sense that everything has some order, even the random but esp the complex; nonuniquity; twiceness, twoness; return to position; subinfinity of variation. The tree before me, its branches and myriad leaves, will rustle, thrash, and twist in the wind of a wilder day but ever it and its components will recur to some average and approximation of their former composition. For reasons of prominence, major design, special interest, projected theme, &c the scanning eye retraces paths and recurs to loci (what the arbitrary will inflicts on the world!). The epigeal roots are periodic rays over which the eye stumbles and the imagination circumnavigates. The eye examines the figures in the foreground in a needlework of recurrent thought, mostly quasiunconscious, about the grammar of the clothing, faces, postures, and suboceanic nuances obviously subscribed by masses of experience. Analyzing the picture and analyzing my analyses I am reminded from what side of the conjunctivae

(2) IDENTICAL. Identical things occur in the world (an object is self-identical there are atoms). At first blink this homely tree might seem excused from most of the sense I intend but admittedly the tree is self-identical and in fact it makes my point rather well, by dendrogramic resemblance and approximation, by geometric and mathematical relations luminously displayed, by the bland sky shooting through its arms, by the artistic mathematics of this sight, by the identical particles and forces of its biotic existence, &c. The dictionary defines identity as "the limit approached by increasing similarity" and how this resonates with regressions of the verdure, structure, foliation, stand, and full componentry of this photograph! It is not without signifigance that communicating men are as identical as they are and the culture, language, &c involve all kinds of identity in great degree.

- (3) HOMEOWEROUS. Having like parts, being like parts, being 'like' parts. Identical, recurrent, homeomerous--consider. If one arbitrarily drew lines across the visual field the resultant parts could have some universal degree of identity with all consequent experience, and in their collection could even function as a sorting alphabet; the resultant intralinear patches could then be compared with each other. Look at one's hand, the faces of one's fellows, the very recurrence of streets, the number of trees, the average cloud, and, in the picture before me, the commonness of the trunk and many branches, the leaves, the grass, even the figures and shafts of light; the leaves are of various and yet foliate types and there are many examples of each type, even the leaves and trees come into comparison, eg the picture is filled with clusters and chromatic and tridimensional areas; the picture has and enforces a 'figure' of texture. Tremendous symmetries demonstrate themselves, the above plus bilateral, radial, and spheric symmetries, symmetries of mere continuities, symmetries of size fits, the tremendous symmetries or disciplines adhered to by forms, symmetries of exploration or signs in experience interrelating detailous and experimental events in time, &c. Symmetries of memories stretched in time. Covert statistical symmetries. It is important that the recognitive discriminanda are often founded in very esoteric and complex aspects of active past experience, and operate systemicly in the present, so that the cues for the recognition and evaluation of a leaf include such things as one's past polysensory acquaintance thereof, of the phases and transformations of such and only abstractly related things, of one's digital manipulation and laceration of leaves in various situations, &c; this is true of these items generally.
- (4) HOMECTRIEUTIC. It is a common occurrence that many things will start out being superficially or deeply dissimilar and incomparable and yet in the end prove similar, comparable, or one; that is, in the end essences or working criteria may emerge, or be arrived at having first been sought. Movies end the same; mix elements and they 'end' the same; convergence; differentiation produces similarity; if one wants to find some identity between things one always can. In any case, similar endings generally and idiosyncratically serve recognition, and many things in experience and often important in recognition are recognized only after a while or a sequence. Relatedly, it is often specifically the process, activity, and dynamics of things or general events which is the matter of recognition or which is primary to further discrimination. Because of memory (of various kinds) the analysis of events and the perception of 'endings' may be temporally discontinuous or simultaneous with a multitude of perceptions. If one analyzed a set of random elements, subsequent groupings could be identified at any point as endings. Various possibilities for change, rearrangement, and interpretation are obvious in the picture before me but the picture is still and the representation is rather conclusive. One's imagination can walk around and climb the tree but there are implicit measurements and these complexly comeasure all manner of associations and ideas and one can think of these as homeoteleutic or variously heteroteleutic. It is likely that the highest discriminations a man makes are intricate reflexes of which we are ironically insensible.
- (5) DENSE. The picture before me is thick with objects, aspects, values, and intricate ideas, heavy with intercorrelation. The mind forming hypotheses is righly enabled to test these by looking further or otherwise or within memory. There is a tremendous redundancy about the real world. Parallel analysis by the brain affords endless certainty, differential perception, and ready recognition; and homology extends forever in experience. Prolonged analyses and countless convergences are possible. And these immensities are obtrusive and inescapable. The world is hardly blank, surrealistic, and monotonous. The

picture has three figures; that they wear cloth is insurable by dense inspection of the material; the lines which suggest and distinquish their bodies are continuous, long, and many, their courses full of information, eg of analogic kind. The tree has many branches projecting in many directions and ways, the surface of the tree is extensive, and the leaves are virtually innumerable; other trees stand in the background to contribute a logical and corroborative setting. The umbrageous mat is a newspaper of heterogenous and homogeneous information. The analogic 'information' of the picture is infinite.

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- (6) HCMOLOGOUS. Like origin; same relative position, value, proportion, structure; a catchall. Branches of trees tend to occur at like heights and apically on the trunk. Within this picture and between memories, secondary branches appear at similar distances and angles, and with similar ratios of successive branch diameters. A 360° walk around a tree returns one to an identical position, as also only turning around on heel. It should be remembered that the differentiative complexity of brain is probably vast, and within this the structural similarity between all trees must be a fabulous coincidence.
- (7) ENERGETIC. Hence preoccupied -- a typical consequence of busyness! The world is a panorama of incessant, complex, and multiversal change, and it is a peculiarity of our world that this transformation is regular so that order increases the more change there is!
- (8) SPECTRAL. Hence continuous! Spectra have the ability to encompass extraordinary change, variety, and complexity, often in tiny terms. Spectra accumulate in the mind regardless of experience, functional and differentiative spectra automatically comparing and abstracting experience; thus the mind naturally acquires hierarchy, versatility, and recognition. The obvious spectra are those of color, sound, somatotopy, weight, velocity, force, size, angle; but there are esoteric and complex spectra, matric spectra, of combination, probability, fine statistics, temporal order, random similarity, acceleration, multidimensional experience, intertransformation, detailous facts of experience, counting, and all the branches of mathematics. Fourier analysis of visual space is just one example of the subtleties and omnipresence of spectra and their utility. The ability to rank the elements of the picture before, me, and all memories, so simplifies recognition as to make it entirely different, og differentia can be assigned and a very simple impression crystallize and assert itself. By spectra and continua the picture is here and there smoothed and developed. The brain may do a parallel analysis of 'people qualities' with such massivity that the human figures are abruptly highly classified and surrendered into probable and possible themes. But think of the statistical correlations and specificities of all of life, present in the mind and the world! And very few correlations may effect uncanny specificity in classifica-
- (9) CONCRESCIVE. Things grow and fit together or appear by or as the peculiar fittings or nonfittings of things or by arbitrary mental arrangement or by arbitrary inequities in analysis in each case stopping at differentiation. The set of movements of the tree in time brings the parts into inevitable mental connexion, union, structure. Ideas and features lodged in the mind, subject to further experience, come into relation inter se and inter res, a large test goes on. This nonisolation, essential homogeneity, and redifferentiation of things, its universal reweaving, filters mind into world. Bis, it may be the modes of interaction and autocorrelation that may be perceptual. The pure chaos of neonate external and internal possibilities fades into modal normality with time and experience. In any event, things that are seen at first as quite unrelated, exotic, and featureless may with handling, time, and regard be recognized through concrescence.
  - (10) CONTEXTURAL. The great order of the world. All scenes have some

positive and negative statistical texture. The dictionary says, "The act or process of weaving or of assembling and putting together parts into a connected structure. The arrangement and union of the constituent parts of a thing. Fabric. Context." My implication is that the world has great contexture, and that this contexture affords recognition of things, eg it is not easy to 'fit things together'. It is interesting that texture is "The essential part of something." I visualize the measure to which concurrent things may be intercorrelated as wholes and parts and to which the mind may exploit the statistics of things and their signifigences across time, as in the tension generated in immediacy by the membership of a perception. The correlation, uniformity, and dissonance of the picture before me are obvious and just as obviously applied.

(11) CONFIGURAL. Things always hold some kind of figure (even interstices) for continual and analogic reasons, configural relations are always informative (as in infinite sets); there are infinite configurations of events and qualities; objects and elements (virtually) always figure in other and many events. If one stares at a pattern of random dots or lines there appear myriad and tireless groupings, similes of the real world. The roving eye pulls clusters, structures, and apparent meanings into attention in the picture before me. Real forms (that is, specific things) are identified, and it is clear they are associated with each other and with memory according to their prominence or the concentration of attention, or the power of mind to alter and discipline the diffuse relations between things (the dispersed embodiment of percepts). The assertion of lines, surfaces, solids, more complex coordinations and ideas is obvious in the material of the perceptual world.

(12) COLLINEAR. Eg of curves in a figure (waves, rows of clouds, bark, pebbles, scanned roses, scanned mountains), intersections of extrapolations (eg bracts, brushes, webs, 'blankets', sheets, clusters, meridians, summary 'flows' &c cover profusely most objects in the eye). Not only is the world gravistatic, but essentially Euclidean, edge and volumes' extrapolations, importance of lines in structure spaces, and quality; all things may intercorrelate edges, even if oblique, displaced dispersed, unequal, crude, &c. The photograph shows perhaps ten to one hundred thousand lines, some longer and plainer than others, so that there is a hierarchy; the bodies of the people and tree, the wooded skyline, the articulation and parcells of the verdure, the overlines of the vines: these outstanding contours may give precedious recognition of an important setting right at the hierarchic top. Needles to say, the stereoscopic cues (panoramic vergence, distance-size inversion, patterns of light, distance-detail inversion and distance-population (qualitative and quantitative) 'invariance', &c), in their synthesis, provide simplified collinearities.

(13) CONTINUOUS (eg vines and streams) & TOPOLOGIC. Cojects are continuous upon omniversall coordinates in perspective, or these coordinates are incessant. tioned spectra supra, but also various (often correlated) uniformities (often supraindividual and abstract) mark the world. The photograph and tree are rather continuous in time, the people gracefully hold their poses, or their actions are smooth or graceful. The flicker of the leaves is continuous and the set of motions have continuous axes and rhythms. The overarching sky is a continuous dome, as is the plane of the land and groupings of objects upon it. Organized fields throughout the photo-however interpenetrant, complex, and graded-vie with one another in a tangle of outspoken continuities. Even curves are continuous and it may be said that a logical continuity belongs even to the groupings of vines and associations of leaves, and the isleted wood. The shades of green are tempered and intergraded by continuities, and the interdigitations of leaves yield to massive continuities. There is an internal logic in this picture which confers great continuities on the elements, whatever they are. One is attracted by the idea that the brain preserves tremendous continuity in its transinformations, eidomutations, and ideomorphoses so that eidetic memory is nevertheless echeloned. Bis, if one go anywhere in the

world its situations recur and the sky and ground are continuous, aoristic hetero- ( genization bringing homogenization by the inclusion of classes, or complexity simplicity ("The world is simple even in its complexities and complex even in its simplicities."). But continuity means relative continuity and thus you have probability and the indivisibility of the whole. A characteristic of the world is the inequity of changes and proportions and thus you have the origins of the idea of continuity and its lodgement in the operations of experience and behavior; thus "freedom" arises from order. The functions of the real world are continuous, thus the puffs of wind have large and graceful cycles and bodies and origins whose interplay generates recognition. The poet sings of continuities beyond imagining, or at least seeing, and yet silently and truthfully working in the world, or, better said, working the world. Who knows, however, what great moments and what entire events the mind, set to its own time and logic, circumscribes?- Invertebrates may & recognize motions and events eased through a day! And mind, grasping firmly a few small particulars or a terrible load of facts, may spring into consciousness things of otherworldly subtlety and parvitude. The continuity of the world is pendulous, as great as all the grassy blades in the world's meadow. By "topologic" I am referring to the qualitative, spatial, and dynamic continuities of the organized world and their replication and recognition in brain; since I think the brain uses dispersed random bits, even as the types of order are differentially accentuated, this means all the irregularities in the random (paradoxically, what we would call "regularitie are topologically accentuated (the emphatic process is as unidimensional as telescoping) so that the mind is "toparchic" and experiences impinge on and act in the mind as hyperdimensional planes (topologic surfaces). Aspects of causal integrity, solidity, physical disposition and rotation, surficial collapse or limitation, transformational invariance, &c are also intended. One can find one's way to the city because of the continuity of the road, and choreology, or the differential duration of large things. Infra "isopores" remind us that streams and lakes represent continuous and minimal declines that belong to any reservoir and lan

(14) COMBINATIVE. Things tend to combine. Things are essentially combined in all kinds of ways or may be grouped, there are some mathematical groups ("atoms"), which can give great predictive power -- the world is filled with all kinds of probability; various properties may have difficulties of combination, sets of elements may be compared, the combinations of the world are its real course or lawfulness, all kinds of things may be combined for prediction, the test of a prediction never ends. There are the supra items eg spectra, continuities, homeomeries - and the infra items. There are various imaginary circumstances combinable with the picture to give its interpretation or prognosticate; eg the fiction, the fact, or the interference of the photographer. Gues in the picture (such as they exist, are chosen, and are handled) conflict and large overall interpretations of aspects compete. Empathy wonders and perceives linear and nonlinear renderings of the specific relaxation, skeletomuscular posture, interposition, psychic attitudes, character, past experience, and universal circumstances of the ensconced at the tree's feet. Mind works to enlarge the photographic wedge into a spherical landscape. More specifically, I have in mind the tendency of the various organizational aspects of the world ("the texture") to fit together in equally particular ways, and the fact that the phenomena of recognition, being somewhat indirect and overlying what is fundamental. change in endless brocadings, scintillations, reflections, tumblings, hammerings, and vertically and horizontally massive and analogically infinite hierarchies; moreover, the combination is accompanied by a type of simplification or diminution of the complexity of the world and by novel complexity as well (as in the organization of a map). As recognitively, toss a lot of things together (particularly in the multiprocessual organic world) and they inevitably combine, fuse, and interact: the texture of the world is rearranged. The people and the tree are easily combined (hence arboreta!),

the sunshine combines in luminance, the plantlets combine in four-leaf clovers, the vines and tree combine in a geographic locus, the planes and solids of the leaves in perpetual contact manifest their geometry by mutual impingement seen by the eye and parallel-processed by the brain in a tridimensional texture, and this picture is combining in memory with all mind'stoparchic order.

(15) CCRCRETIVE. ... and stay that way. The various leaves, swept by wind, interlocked, compressed at the limit of the bough, change more slowly for a moment, as a leaf liberated by conjunction of breeze and bough may briefly but nobly waft with the wind and chart a course to the combinative ground and there concresce with its fellows in an autumnal carpet leading the mind elsewhere. Concretion obviously also simplifies and complicates the world; but in any case, informs by its differentiation and convinces by its order. A man's face is an orchestration of expressions, and indeed the progress and culmination of a symphony may be an internal destination and adaptation, and filled with concrete timbres and regular relationships. Lanquage is a concretion of sounds, shapes, ideas, and associations. Society is a concretion of idiosyncratic wills, a regularization of time, an order to creation, a manifestation of fidelity, a consilience of feeling, and a drama of convergence and concretive diconvergence.

In a grander sense, polarizations typify reality.

(16) CONDUCTIVE. Hg effects (all interrelated) spread and give themselves away, "God is not melicious."; entire fabric of things is dynamically, even definitionally (convergently), interrelated (synergy, web, pool, adjustment) (eg tree blows to side, all leaves adjust, conduction between clouds and microclimates, people adjust underbough); intercausation; see elsewhere. The conductive nature of things is seen in the science-fiction stories where finite, small, trivial, or infinitesimal events transform and divide universes; changes and facts propagate themselves outward through the entire tissue of the world, in agitant and informational avalanches: the massive parallel-processing of brain, the precise intension and firm will of mind, and the harmonious webbed counterpoise of the world mean that these buried conductions are somehow recognizable by mind (perhaps in part because the fluctuations of the world are intramundanely and rhythmically coherent, and because a matrix may analyze a matrix). Tremendous eversions, obventions, evidential multiplications, and overlayering characterize the world. Fortunate are conductions and conductances for sensation:

(17) COMMINSURATE. All kinds of things have common scales and measurements; again, if just by the calculus of difference. The photographic objects have apparent and absolute relative tetradimensional sizes and other primary and 'secondary' qualities, and this relative and absolute commensurability extends throughout the omniverse and the shelves of memory and the mantic museum of abstractive mind. Dictionary, "Corresponding in size, extent, amount, or degree." The period of the boughs' swinging suggests the velocity of wind and the nearness of storm; the color, brightness, architecture, and clarity of the atmosphere tells a fabulous amount of ambiguous things (this specificity amid plurality is archetypal of the world-the intermeasurements of the human figures is an example of an "ambiguous story"); the apertures of light tell something about the fullness and density of the tree and about the process of seeing itself; the recognition of pattern requires the intervention and elaboration of measurement (as also the recession of the landscape serves telestereognosia); the measurement of facial features makes each face unique and "a book"; the commensurability and singularity of causes makes this picture historically, contemporarily, and futurally cognizable; numismatic commensurability denominates society. Objects, things, and events occur in typical (however complex) measurements.

(18) CONCINNOUS. As a crossword puzzle; structural adaptation and sampling (apparent concinnity). The trees are rooted in and rise neatly from the ground, there is a 'neatness' about the sky, in the dress, in the contignation of the tree, in the interposition of the leaves, in the tested & organic & natural placement and extension of the vines and trees, of the neatness of the general existence. This

property is shown in the rowing and piling and paging of books, in the equal hedral tessellation of pebbles on the shore, in brickwork and architecture generally, in the hilling of land, in the combination of streams, in speech and behavior, in typography and orthography in chariety.

typography and orthography, in chemistry, in ecology.

(19) COMPREATED. This is the converse of homeoteleutic (which see). However different some things may be or become, they may have similar or identical origins or beginnings, and this differentiates and simplifies things a great deal. The later course of things can be traced therefrom and this barren homology may constrain things or add their special intercorrelation; it is interesting that all plants arise from genomes. The contemporaneity of experiential introductions is often tremendously informative, and the precision, kind, and complexity of concreations and conintroductions can be 'decisive' (in decision, analysis may be terminated). (29. Webble (and part be)

(20) GONOHOMIC. Everything began the same, and in various ways and degrees and one can point to any two things and say they began the same.

(21) CONCERNEUL. Eg the concerns of everything are in anything and of anything, everything; more specifically, specific but 'important' potential correlations or detail-statistical correlations are 'hidden in everything'; oddments; whole is greater than parts' sum, whole governs, creation dual: large & obvious, & molecular' & basic; world a 'sponge' or hologram governed by mysterious waves (which could explain Carl Jung's "synchronicity" by assuming the world essentially ambiguous and endlessly deceiving). [Mac may be a Communa that there is also affectly antapped in representative

(22) COVARIANT. Intervariant, &c. Thus the tug of the leaves on common stems in and in common space brings regular covariance between all the leaves. The motions of one of the human figures elicits complementary motions in the others. The raintaining of sunbears on the ground is a function of the flutterings of the tree to above, in turn a function of the ground-governed fluctuations of the collisive wind, a function of the solarization, &c. In a magical way, these everpresent in the world. They are the heart of experimentation. Likewise covariations are intrinsic to the brain. The transmissions of sound and light may make the actions of a crowd of people instantaneously one, and in any case the millings of the crowd, informing the mind, are profoundly and novelly covariant and affectable.

(23) ANTAGONISTIC. To do one thing or to be one place is to exclude another, for certain actions or events to occur is for others not to occur. The world is abundant and ordered with antagonism. The decisions of a committee may differ from the parts' sum or average. The games that people and materials play may be of great intricacy, fascination, and information. That the tree sweep once to the right in a gust is to temporarily offset a sweep or position to the left. That we exist in one world is to exclude another, that certain decisions are made is to finally exclude all others, to direct the world in one irreversible and specific course. That the room is dark is to obscure its contents, and that one object falls within a shadow may be to darken or exclude another. Antagonal extinction

(24) HOMOCHYTRIC. In a certain sense all things are centered on the same thing, all events correlated about the same point, as if the various limbs of the tree attach to the same trunk, or the physics of the tree and people is at a fundamental level the same. Certainly the changes that occur everywhere have a bearing, now or later, on any small aspect of the world existing in apparent isolation or no. In large masses of people, in societies, often a consciousness and an even deeper coessentiality pervades everyone and everything. Often one can ascend to some abstract plane or identify some comically specific, if momentary, trait that confers a unity, determinism, or simplicity to the greatest complications.

(25) CONFIDENT. Does this refer to purely or seemingly overall pattern of change, representation, appearance, &c adequate for description and recognition

Various quillion may be acked atout I though a court from he train payed in the train any be appealed in the a very long full falls.

because of its intricacy, constancy, spontaneity, adjustment? One thinks of the scanning eye, the stream of consciousness, the flux of experience, the stream of the controlled concatenations of brain states, the universality of references, the interchangibility of settings, the fluid structure of the world, the common resolutions of its part (as in analysis or disclosure), the interactions of tandem events or the cosequentiality of the world.

(26) INTERCURRENT. Events occur simultaneously, and in this world gain an independence and heterarchy that is a class of recognitions and a source of corroborations. Things happen or pass between things? Things happen together? One doesn't see "things", only their transformations? One's actions changing

things ordered, too? Things prove to be other things.

(27) AIGEBRAIC. With reference to kinds of functional groups in nature. Sautterlays

(28) REGULARITY OF CHANCES. & characterist (6/ (conseque)), produce, proposition of characteristic production, the configuration of the

(30) CBC III. ATION Maguely, Explan, or gest comply com, process, rages, nament, becomes surply " Thereby, properties stay for properties of the properties

(31) DEGREES OF FREEDOM. All though is which weathers on change, 3 - 4 chiarmons - tendana to the consumer, in general, a

(32) PRECISE PERIODICITY.

(33) RHYTHMIC. The various principles defined, such as antagonism within degrees of freedom, create patterns of successive, interactive, novel, complex, and identifying & regularizing rhythm. The rhythmic structure of the world doubtless defies description and maybe belief. An obvious case is the rhythmicity of sound waves or vibration whereby the events of the world are smoothed, qualified, and integrated. The language of the emotions may be constituted by rhythm as it is in music, poetry, art, and law.

(34) ISCEHRONOUS. Synchronicity of laws of events, absolute and relative

time, 'coplacement' in time (a minimum), identical development.

(35) ISOPLASTIC. Changing together, changing similarly, change itself is ruled, changes of all things are the same; react or do to it what one would, it's always somewhat the same.

(36) VARIATION & CREATION. The provision of identifying novelty. Flux and profound transformation are the world. (With each one of these things, you realize, you can raise up your hands and say, "Thank you, O God, for you have given light

unto me, and relieved me of my burden in this way, and made me wise.")

(37) ISCOYNAMIC. Structure of motions similar, causes of effects and signifiganc of motions same; strong. This holds for the collective motions of the leaves and the random sortation of all motions, changes, forces, and communications. It holds for the (however different) motions of the figures as to and between themselves, the different and analogous motions of the fingers of the hand and the branches of the tree. It certainly holds for the course of the sun across the sky and the life of winds.

(38) IS OPORIC. Sameness of path. Example of a class of things. The very complex order of things creates extremely specific relations or their possibilities, even random things ordered ("isopores"), random recognitions and patterns can be highly telltale, possibilities ("in the midst of chaos") can find themselves, every complex terrain can admit of unique, shortest, simplest, best, working, starting, &c paths (streamlike). The oscillation of the branches and the walks of the people

are rather literal examples of a concept much more profound.

(39) ISOPHORIC. Having the same direction. Bearing the same information. Information can have extremely broad, dense, different, cryptic, and arbitrary embodiments; extremely different things can be in ways extremely the same; all kinds of things are equivalent; diverse facts and knowledge may be quite redundant or the different informations may fit together nicely; extremely different things can bear the same features; parallel lines may converge at infinity and imparallels not. The head of the tree, in addition to having innumerable functions, may be a weathervane, a receiver for all the ambiguities of past, present, and future weather The grass and the trees may tell of the wind. Faces may tell ambiguities and diversities. Quite different things, if not extending to the same end, may have

common transient or enduring directions.

(40) ROUGH & RANDOM. Hence distinguishable and orderable: These things may, through their disorganization, simplify complexity. On the other hand, nothing is truly or absolutely random, quasirandomness prevails, and there are various types of randomness and systems for generating randomness. The uncentrolled flux of things enables subtle correlations to be recognized and arise. The gradient and disjunctive topography of the world enables, through mutual adaptation, the existence of subtly dissimilar fields of data. Nothing is regular, or the approach to regularity is strained and hence telltale and differentiative, but is instead filled with errors, flaws, irregularities, discontinuities, marks, adventitia, innumerable qualities and signs, and convergences of events, forces, influences, &c; everything shows a history, histories are always different, the differences are always ordered, the orders are always signifigant, all histories interlock. The random and massive play of forces in the world bares the nature of the world in an opulent and unforgettable display and encourages the interorganization and hence partial convergence of all things. The massive parallel-processing of the brain extracts signifigance from subtle but critical or generalized signs and in this "intuitive" sense makes sense of the weather, categorizes the amorphic and men's faces, interprets timbres and smells, and comprehends the globe. The amount of variation in the world itself and consequentially creates the immense variety thereof.

(41) MULTIPARTITE Hence many opportunities for recognition and cross-recognition

obtain. It is an unusual grouping of the world.

(42) BUNCHID. Weeds and trees and people randomly and nonrandomly bunch and variously aid recognition. Aggregations, nestings, associations, coincidences, intersections, interferences, &c frequently tell the big story. They simplify.

(43) GRAFED. There are types of groups and the objects of the world occur in them, functional and necessary groups with evident consequences often rigorous and decisive; the functional associations and modes of action of events. They simplify and complicate.

(44) ISCYCLIC. Eg different things belonging to the same particular, general, or formal cycle or rhythm, or cyclic continuity across time. A given velocity and direction of wind causing each leaf to assume a characteristic frequency of flutter, the figures under the tree may be lit by an indicative assemblage of many frequencies. Cycles may be concurrent, interpenetrant, complex, cooperative, &c in great numbers and with the creation of novel cycles, all serving nicely the wondering eye.

(45) ISCTROPIC. The world, objects, and perceptions have dimensions whereupon all values are identical; or exhibit properties with the same values when measured along axes in all directions; large parts of the world are monotonous; there are ubiquity and transcendental objects, values, events, &c. Thus the lessons of one leaf are transferrable to the same leaf later or other leaves, and the lessons of

the tree carry to all trees and the entirety of experience.

(46) ISCCONTENTIAL. Large swathes of the world involve the same things. any book and it contains words, letters, paragraphs, and same & similar & interrelat ideas, references, settings, happenings, meanings, &c; and open any book and it contains the world. On the other hand, like and same objects are typically multipartite, nested, &c in a regular and irregular fashion that is extraordinarily indicative. The volumes of space about me in the room and apparent in the picture contain suprachance, indicative, and usable collections of many things. A random nest is self-same. Typical situations are, as in my introduction, universal. Enormously specific and intricate organizations or collocations, as men's bodies, exist multiple, often in extraordinary number, commonness, and reflection.

(47) VACUCUS. Large swathes of the world are "empty", the world is simply not a plenum. The aerial spaces enable light to shine to and reflect from the scene, the tree to grow naturally, the photographer to make his quest; the great uniformiti

in the picture provide graded contrast, continuum, and situation.

(48) ISCAUSAL. Causes are finite, universal, subtle, linked, intergraded, multiple and few, inescapable, persistent, characteristic, proper, and differentiable. To learn one cause is to learn something about other and all other causes, hierarchically. The etiology may be the nature of the thing, and causes may show persistent signs of their effects. The cause of the motion of one leaf and of all of the inhuman landscape may be one—the general and momentary wind. The causes of the behavior of men may be universal and simple. The causes of the wearing of clothes and the day's weather may be intricately one. The cause and the explanation may be one, as the tree and the people are 'explained' by the soil and atmosphere. The signs drawn on in perception, from the depths of memory, may be simple and strong because of the universality, parsimony, power, interlocking, &c of laws.

(49) LCGEAL. The rules of logic and the formulae of mathematics are amazing and lucky worldly order. A comparison may be made to form versus content in art.

(50) NCLIC & ISONOMIC. Same laws and rules, same way of appearing and occurring. There are laws which are the rule and rules which are the law. There are natural and artificial laws and rules. There are such things as facts and as forces or that to which all things fundamentally &/or ultimately refer. After all the detail and variety has been seen in the world, after all things have been discovered law rules.

(51) ISOPHENAL. Same way of appearing and occurring, or having groupings of general appearance. The world demonstrates the same thing everywhere and yet everything has its colors. The same or different things may be isophenal.

(52) MONOTONOUS. Single values or intricate but monothematic immensities may fill much of the world, or values may be held to exactly. Even in its fullness the world is vacuous.

(53) STATIC, CONSERVATIVE, STOICHIOMETRIE & ELEGANT, & OLIGOVALENT. All these things are typical and essential of the world.

(54) ISANOMALOUS. Having anything in common or deriving commonality at change. And everything has something in common, special things, and in special ways. I said above that the forces of randomness at foot in the world, such as the free play of the wind in a landscape, spark forth direct and indirect, often parallel-processed, relationships; a static picture "come to life" may be the difference bet fiction and absurdity, and fact and meaning.

(55) ISCPYCNIC. Equal, regular, or typical clustering or similar density. A good property for distinquishing "nests". The degree of heteropycnicity, or its kind, may tell a lot between percepts. The density or clustering, besides, is micro-, multi-, and interstructural and as a consequence the analogic information is enormous.

(56) ISOTOPIC. Absolute space, relative space, substructural space, typical location on or of an object. The location of apples on a tree may tell me something about the season, as does the orientation, direction, and proximity of the figures at the foot of the tree, the composition of muscles on the face, the mutual position of the elements of the tree, the holding of the magazine, the arrangement of the Vines (if just suggestively and ambiguously, or for future reference), and the apparent geographic locus and position of the sun.

(57) COMCTIE. Things tend to move together (or movement is relative). The degree, kind, number, appearance, background, time, &c of the comotion tells me a lot. The tandem and mutual motions of the leaves, and the timing relative to other trees, enables me to judge this is a tree, the velocity, direction, and structure of the wind. The parts of the body do or may move together and when they do not this tells me something characteristically and preparatorily. The basic or structural motion of all things about me tells what is the world and what is part of it, which enables a simpler mathematics and an interpretation.

(58) IS CTACTIC. Similarly arranged, recurrence of same pattern.

- (59) PRECISIONS. Particular memberships, particular measurements (as obvious or parallel-processed), extreme precisions, the ampliative consequences of precise differences being decisive in the world, &c simplify recognition. It is not realized how varied the world is and how specific modes and entities of combination are, nor in a sense "how much man knows" by the details and order of his experience expressed in his actions or the details of his perceptions (as in the unconscious of feeling) ( professor to by to white to expend)
- (60) MEANINGS. Which are progressive. Everything is the way it is "for a reason". These various items combine. Types and nests of combination exist, stratified, throughout the world. Meanings may be arbitrary specificities ("isopore

(61) SPECIES OF OBJECTS. This is a less 'essential' category. Sphere, branches,

cloud, grain, face, planes, furrows, &c.

(62) COSURFACES. As this. Eg the "line of the horizon" and the "outline" of the tree, or the bundle of the tree, the figures, the lay of the land, and surrounditrees, inches where the property limits programme.

(63) SHAPES. As this. I have in mind "abstractions" or 'more essential', 'least

complex' structural criteria, or their arrangement in sequence as a law.

(64) HULOTACTIC. Having the form of the whole. Thus wholes or the whole may be critical in perception. "Epitropy" may occur to the whole ( which it weather the sheet it was the standard of the standard of

(65) IS GEQUENTIAL. Some or all things follow each other in particular orders

or at least sequentially. These may of course be "ambiguous stories". &c.

(66) PROGRESSIVE. One change occurs out of another, the totality of changes and changes getting out of the way of changes making things possible, the various orderly possibilities of the future obviously or signifigantly inhere in the present future possibilities are restrictive; 'progressive' changes enable learning by bringing systems of possibilities into each other or by being systemic.

- (67) COORDINATED & CRGANIC. Functional adaptation; the whole is systematically correlated, the particular order of the world is historic and highly developed and as such extremely informative, self-revealing, and 'mature'; the present is filled, engraved, and engrossed with all kinds of simplifying, regular, partial, potential, dynamic, multidimensional, cyclic, static, interlinked, deeply imbedded & deeply expressed, typical, systemic, increasing or tartigrade, basic, hidden, interdivided &c equilibria, and innumerable & infinite congruences, ingressions, explorations, results, and signs; now nature is highly abstract.
- (68) INFEGRAL. Everything that now is is that way dependent on other things, it's extremely self-adjusted and compact, the present is a refinement of history and as delicate as history.
- (69) SLOW. Hence studiable and correlable. The tree does not move infinitely fast.
- (70) FAST. Hence full, preoccupied, interactive, and final! The tree does move, and quickly enough and with enough variety so that much may be learned in a second, a minute, or an hour.

(71) ANISOTEMPORAL. Hence providing great variety in time, &c&c, eg a huge

piece of time, cross-sected, can be very informative.

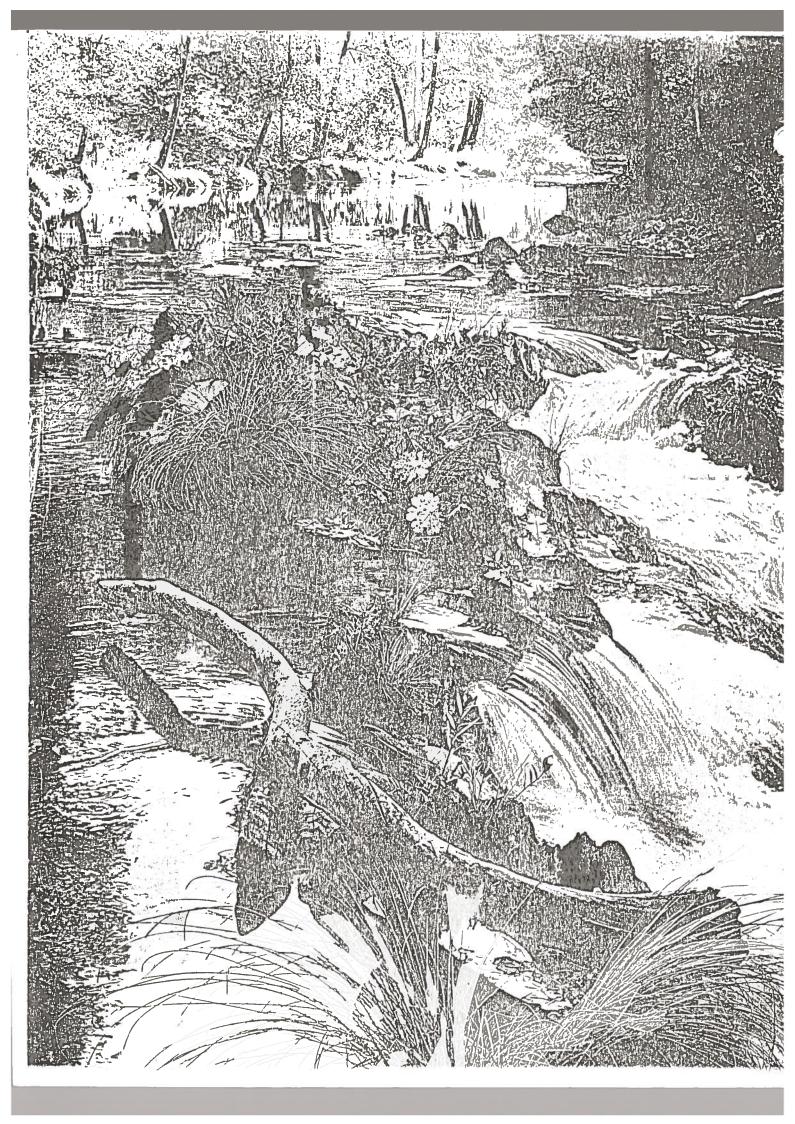
(72) GENERAL VARIETY. Huge bandwidth in 'hue, saturation, and brightness' with great organicity of these things, FM, ultimate complication (cum order!) of 'timbre 'even' and meaningful clustering, good omniversal distribution, self-modulations by society and the individual, many primary qualities, kaleidoscopy and self-variation (automorphism) & interaction & exhaustion & multirepresentation & iridescance 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.

(73) INTERMODULATION OF THESE 72 TRAITS.

It also might be noted that the world is "irenic" (free of change) and simple (free of excessive complexity), or this is the way it finally appears in mind. And George Santayana said of science, "It is willing to reckon in any terms and to study any subject-matter; where it cannot see necessity it will notice law; where laws cannot be stated it will describe habits; where habits fail it will classify types; and where types even are indiscernible it will not despise statistics." Finally, it is a peculiarity of the holographic theory of mind that I favor that it may employ in a measure an aseptate reason wherein induction and deduction are virtually simultaneous, and this may be the explanation of what we call intuition.

This then completes my phenomenology of order. In the world which we perceive about us there is a hierarchy of 'subtypes' that expands inconceivably but not altogether insensibly. Order is so overwhelming, interpentrating, and interrelated—though simple—that nervous systems become less curious.

HOLOTACTY (axes; also cognition using TECH AND A SPORT WAY OF rock OLIGOVALENCE (few and narrow color) RHYTHK (which can even be spatial, dissonant, collective, and rendom) eg PRECISICN (relative heights of windows) CONCRESCENCE (sylvan cliff base) HCMCLOGGUS (mineralogic color) -domo caltance Antagonism (dark v sight) IS GEGIEALY (row of windows) IS CLACIT (horizontal) ISOTOPY (basal trees) "GENERAL VARIETY" whole scene) COVARIATION IS OC CONTENITY POLYMERY HOLOMERY MONOTONY Ship Rock (far left), memorializ-Rock with wings," Navajos call ing a tradition that the monolith once was a great bird that brought CONFIGURAL (and note overall Navajos here. structure of picture) -CONTEXTIONS COLLINEARITY (note abundance of 8 and different types) (trees as a group, individual, trees, COSUMERCES GROUPING (concurrence of colgns and windows) SHEFTRY (width of werticals) IS OPHORY AND RANDCAMESS IDIOTROPY (change-regularity) IS OPHENY VACUITY EGANCE (eg location as pluylaconclination HCMOTELEUTY (terminion) IS OPYCINY INTEGRAL DEES ITY (1sengularity) CONTINUITY CONCRETION of materials)



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## PEREGRINATION ON SOME OF THE SING OND ORDER ORDER IN EXPERIENCE Pat Gunkel

Foreword. Beyond 1st and 2nd order order lie suborders or n-orders, types, examples, and 'finally' the texture of the world. Bis, intersections of 2nd or lower orders evoke singular, plural, and ambiguous things and possibilia in all cases, their full sorting being the proper structure of the world and its subjective minds. Matric application of the adjectives to the nouns may eg modulate either the sense, meaning, or reference of the nouns in the generation of a prospective world or in the suggestion of a possible classification. Various of the terms may refer across the column or row in a trivial sense or way, but this does not exclude some alternative, more detailous modulation. N-order "rings" doubtless tell some fascinating stories about the structure of the world. Some of the sets may seem rather meaningless, trivial, impossible, gravid, wanting a fuller multicorrelation and appreciation of the matrix, &c, but even these may be educative. When redundancies seem to occur, these may be profound and the \*essence of the whole thing". Omissions and failures in the 2nd as in the 1st categories may with study or pragmatically show in another light; there are of course the problems of designation, my irresolution, initial and possible versus ultimate elegance, and the omnipresent regnant need for exemplification, application, and the differences of customariness. In truth, the list was put together by way of suggesting the fabric of things reflected in a single occasion of creation; as the list must certainly suggest, definitions of things may deceitfully belittle the intertranslations of things and the importance of context, and thereby elevate the arbitrary when the secret is utilitarian and inconstant. Having just begun to pore over and focus on each of the intersections, I see that the matrix is successful because it is continually challenging, generates raggedness, suggests the acristic, by its very diversity and power creates the concentricity and simplicity of all experience, suggests abstractly and even practically fascinating possibilities and generally has that novelty of a good matrix, its categories apply generally but sortatively to any comparison, it has lots of color, &c. one refers constantly, diversely, mnemically, at least in some of one's best moments, analytically, synthetically, optimistically, trivially, profoundly, thematically, at least occasionally 'exhaustively', critically and organizationally, effortfully, broadly, randomly, nth-orderly and hierarchically, communicatively, usefully, carefully, truthfully, &c to the matrix I believe you may test, like more, and develop the list, and come to see the world anew, how a brain may function more readily, yourself more deeply, how life, science, and art should be and are conducted, the epistemologic basis of many grand and rarified concepts, philosophies, &c, and so forth. That, anyway, was the purpose of the matrix. It is just possible that anything dropped into the netlike matrix may become and thus be elementarily clear, so that, just as the fourth dimension renders the world static, the filamentous matrix and its nth-order congeners may reveal world to be of childlike simplicity, transparency, fixity, and cognoscibility. Then we should be very happy. The matrix has 5144 boxes.

ISCAUSAL ISCCHRONY. This suggests many peripheral possibilities and at least one central, profound one. The way these are positioned or woven together calls to mind a nest and I shall call the whole thing a "nidulation", the boxes being filled with nidulations. At least in this case the nest is tremendous: an extreme number of very specific things are together in a very specific pattern and the hierarchy is great (and most vacuous) horizontally and vertically. As I espy it the world seems to squirm and shimmer, and its decodation and generalization wells memories and problems as a messianic quintessence. An extrinsic or

intrinsic class of things (the distinction is poor) occur together only when causes or the same cause occurs together. On a plane of generality, all or many isochronies may be isocausal. The concurrence of anythings is concausal or has a peculiar effect. Isonomy or the "absolute evenness of the flow of time" gives an isocausal aspect to the universe. When certain things have certain isochronies only certain effects and thus causes (1) may occur. The arbitrary analysis of things (which may be sufficient) may begin with isochronies taken as isocausalities, Indeed, the analysis of cause may go no deeper than isochrony, and many causes are postulated or described on the basis of explicit or implicit isochronies. Often it may be just the rate or mode of development of things that is critical in causation and thus isocausy. (In many of these cases the 2 terms freely reverse.) As in the manifestation of "meanings", the structure of time and space in its manifold representations may embody a tremendous redundancy, organicity, integrity, density, temporal coordination or "streamlining", &c and hence as much isocausal isochrony. It is worth and necessary considering by way of contrast heterocausal isochrony, isocausal heterochrony, heterocausal heterochrony, isochronic isocausy, and other quasitrivial, quasi-unrelated, and formal concepts. By the way, if this discussion is any indication, one could fill 2000 pages with presentation of just the 2nd order order in experience. What a Bible that would make!

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### COMMENTS ON LITERARY ASPECTS OF VISUAL PERCEPTION Fat Cunkel

I am referring to the interests, problems, results, &c of the literature. I have previously commented that the contents of analogous scientific literature include things better left unseen as eg men who are professional scientists have a tendency to fantasize problems and explanations and invent a large repertoire of useless or wrong ideas. This has precipitated an equally imaginary notion that these matters must be answered before the brain, say, will exist explained. Nevertheless, the literature has some value, and

it is this which is the concern of this paper.

"If not 'good', visual forms will tend to become 'better'. Under conditions such as short exposure time, low intensity, small size, in afterimages, and reproduction of form from memory, (1) irregular forms tend to appear as regular, (2) complex forms as simple, (3) asymmetric forms as symmetric, (4) interrupted contours as continuous; furthermore, (5) random patterns tend to be organized or grouped, (6) disconnected pattern elements tend to become connected, and (7) groups of elements tend to become organized into larger whole forms. In general, the visual field tends to become organized and take form." The signifigance of these truths may be that they indicate a polarity of mind toward the simpler, that all 'ideas' share a continuum therefrom, and that the pole of simplicity has an interesting nature; it is a continuum, because of the lacing of the branches, but it is as well a tree-this is therefore a very peculiar organized system and may be denoted an "anastomotic tree", or rather, since vertical anastomosis is also predicable, perhaps we would be better off remembering to refer to an "anastomotic net", a term with a familiar ring but in this case denoting an epistemological and mnemic system rather than strictly an anatomophysiological entity. I may seem in this way to have shrouded my system with a contradiction, but such an illusion is dispelled by any willingness of the reader to admit such descriptions may exist with qualification.

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Sche North CN VISION Pat Gunkel



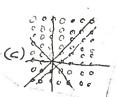
90° biaxial rotatory distribution



rotation learning,
over time
occoordination
(E)

(c)

image structure on
rotina =? as to flat
goniculate or striate?



biaxial retinal coll interconnexions

The granular quality of the center-surround fields or their sensitivity to detail also may make them sensitive to corners -- the rectangle being perfect if the receptoral or ganglial surface is rectangular, as shown in "F". Now certain patterns may lead to various aconnective lines, eg the macro-taxy of the surround-center fields or of various intensity fields. (Obiter, in general, as to these various line fields, a similar thing could hold in audition, certain octaves or periods being picked out or there being some useful matrix for differentiating sound clusters-eg contraspectral acoustic cortic areas A-I and A-II could cause clustering on the runover into lateral parauditory areas-especially as one simultaneous sound must have a complex cross-spectral structure; in fact, the progressive generalization or discrimination could be easy, eg dynamically training neurons already cross-spectrally paired.) These linear fields could have limits imposed later or by themselves (any set of adequate criteria in cells can serve matric correlation, classification, and progressive discrimination -- it justs needs to serve a proper matrix for the sensa).

A grid as shown in "F" only has 90° discrimination whereas David N. Hubel and Torsten N. Wiesel claim 8-12° (= 35-15/clock) column. However, certain polygonal arrangements should be able to reduce the difference over a sufficient cluster of regenerative interconnected cells. One thinks of what horizontal and amacrine cells might accomplish. Now how do ganglion cells already prefer lines (may there be something equivalent about a minimal or optimal summed multi-input threshold both in a 'circle' and in a line—the further extension of the circle, either equal and oblong-fielded eg coming out out as a line, or with the further extension being ideal by radial fraction—the consolidated isodirectional line or series being apt to result in least 'dense' inhibition?)? One reason may be radial fibers or linear cells like horizontals.

It is possible that frequential patterns also give the case or illusion of such fixed, micro, or monodirectional lines. How long do these lines belong to a cell, may the orientation change (why can vertical or horizontal patterns be educated can others, eg an equi-size or equiform, eg cuneiform, environment to test later disharmonious imperception?).

In "A" it can be seen that a particular frequency of spiraling (eg inhibitory/excitory) can produce certain groups of finite or extended transradiations.

It is possible that cells ordinarily and then interferentially declare their allegiance to particular lines natally, and complex holdings, total allocations, and interrelations may then occur. Have isorientive points been tried? In any case, certain critical interstates may commit networks early into bizarre identities. In "B" it is seen that even semirandom clustering or a specified degree or kind of disorder can generate common lines of some length, perhaps in just sufficient number or density to individualize cell orientations. "A" and "D" have the advantage of suggesting why, as suggested by Hubel and Wiesel, orientations may rotate gradually

over the striate. In "C" there arises the question of the relative intensity of the cells' different responses (which, by the way, could be equalized with reinforcement with time), eg where the 90° horizontal-vertical biaxis may be halved (45° < 4°12°) and two lesser intensities fill the gap (0-12-24-36-48); note rectangularity is preserved as an advantageous circuit. Moreover if the frequency, amplitude, or circuit moduli for firing are changed, a larger threshold-space is created with more rectangular radii and the small difference may be achieved.

By the way, binocular displacement may be a surprising similar angle to 8-12° and its compensation and cellular 'specialization' (arising eg in 4-6 week old cats) in binocularity makes one think a similar mechanism might be at work. In "E" it is seen that rotation can easily produce learning over time of lesser angles eg from biaxialit the problem is one of quantization; a solution might be the minimal units necessary for firing. There is also the possibility that averaging over orientation of shapes in time could, eg rhythmically, even quickly, produce progressive n-halving intrafract—say stabilizing per above (how fixed is the angle, and how certain in ontogeny; does the cell response change? &c).

It is even possible that the retinal capillaries and neural processes adumbrate catalytic, definitive, or archetypal lines. Another, random, possibility is that edge-eye following produces heterocellular mixocellular commitment; too, to intersect or begin tracing collaterals of formerly insistently rectilineally traced lines could cause allangular commitment of the remaining cells up to a point of unsustainable and/or pointless complication.

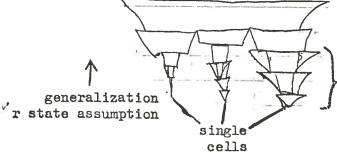
Nothing in the way of lines from chiasmatic interaxonal field, action potential, or synapse as a grating or the like?

That hypercomplex cells can register "angles, corners, degrees of curvature" is perfect: this is the sort of generalization by intercolumnar inhibition and/or excitate that one would expect away from layer IV; it may be chiral and this is easily explained by the above commitment and consolidation, but in any case one sees Euclidean geometry collapsing into Lobachevskian. On the other hand, hypercomplexity might be explained by supraliminal crossover in removed cells (which might be committed or simply automate to any incursion—or even excursion—and degree of learning are possible in any case). Hubel and Wiesel's trouble in finding any more cells may simply be that they have limited themselves to certain degrees and kinds of complexity and fixity in territoric where commitments are vastly more complex (eg n-dimensional, qualified, transient, indecipherably intratissually interactive).

The orientations may in fact be infinitely various and not 8-120, say Hubel and Wie This simplifies things.

Note: Hubel says 40° of effectiveness (=  $360^{\circ}/9$ ) and various cells = any angle as 1 others. Moreover the field is small (eg  $\frac{1}{2}$ °  $\approx 10^{3}/\text{striate}$ ).

Single but dynamic state changes above (eg areas 10 and 39) and below (eg 17 and 18



intra and inter cell groups

The foundation may be laid by isolated or harmonicly interactive cells, and actual at each level each cell in effect starts its own hierarchy as in the overall one show (These are physiologic and need not always be anatomies.)

(note harmonic crossover)

This may circulate by various forms the lengths of recurrents: these recurrents may be parcellation and generalization or analysis. These recurrents may anatomicly or functionally late in ontogeny.



The effect harmonic hi come in slo with a rectangular shape." This exemplifies my point: a rectangle is a perfect combination in an inhibitory-excitory bed or even perhaps in refractory period cells and its preference may evolve over time. A dark-light edge's pattern could easily be preferred by any group of later cells: it supplies a zone of convergence of inhibitory and excitory fields and the change --which could be saccadic but needn't, could be maximal. Moreover, a later ("higher") tissue like area 17 could easily generalize over firing so that it would take this edge condition as critical in an equilibratory set. This firing pattern could be ideal:

Original stick image and traveling wave front. (Line arises from laterogeniculate center-surrounds).

Degree of excitation of line at least half at any point.

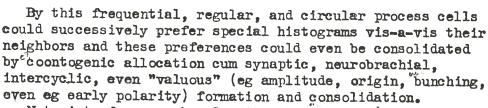
Followed by inhibition?
It is then interesting that such hesitant allocation, and locking in circuits as it does, could gradually apply to the whole cortex, resulting naturally in an interdiscriminatory commitment of various cells to various interpatterns of discharge resultant from interference and excitory-inhibitory relations (by the way, various mechanisms like polyionic bonding, polysaccharidal fuzz, and episynaptic fields dependent on use, could easily create flexible and extensible mechanisms upon this foundation. The secret would simply be the gradual allocation of countercircuits).

By the way, this may explain the report of circles becoming spirals and the op art phenomena of intense rectal and rotary motion, even from fatigue phenomena: a curve may cut a number of rectal cells and create a 'difficult' shape to encircuit rotary lines ("wands") could be the natural product.

Various of these results may imply that these patterned proclivities should be present in all 'recognizable' or very low nervous systems, even invertebrate brains or ganglia--if 'rightly' organized--should function in the same general way.

The absurdity of explaining origination of Jerome Y. Lettvin's "batrachomorphic" optic-tectal spot-following, -switching, -waiting, -watching, &c cells by special wiring and the reason of an interferential-harmonic hierarchic explanation is just about right to explain David N. Hubel and Torsten N. Wiesel's cells.

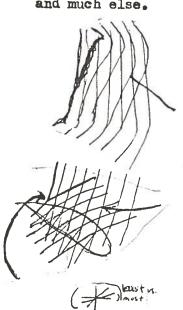
By the way, binocular harmonics and other lateral harmonics in the column off layer IV can explain Hubel and Wiesel's other three cells (to "hyperhypercomplex") and much else.



Note interference anomaly at triple points (anomalies may be picked up as distinquished relative to surroundings—eg by intensity or any other attribute).

Approximation to a straight line decisive in giving greatest intensity.

Two types of cells may be fired by near-parallels and lines versus near-orthogonals and corners. In any case, laterogenical center-surrounds must come first, to positively or negatively ("this is not a speck" over a row of cells) distinquish between diffuse back and a sharp line (diffuse cells being initially prestriate). Striate cells could gradually change in their orientive specificity by preferring cells either a little like or opposite their neighbor (say by the danger otherwise of inhibition). Thus moire patterns could evolve and even create peculiarly perceptive cells.



"The hypercomplex cells detect interruptions of lines." Interruptive hypercomplexi is another thing and also easy to explain eg intersection is general or removed, interruption is lowered response, &c. Also, "complexity" and hypercomplexity may be explained by inhibition and disinhibition and further developed circuits. Hubel's cells may be more complex than he makes them and at once continual—the variety may arise more subtly and in the large—eg matricly.

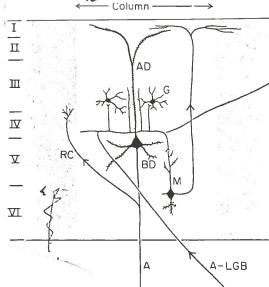
Note the "complex" cells are isocolumnar (explanation could be layer IV feedback or trigger, or triggerless generalization). Moving line detection may suggest inter-histogramic commitment or ab-layer IV intracellular orientation in a local inhibitory-excitory line-sensitive field (and/or the cell may just be to this invarian or variance atop a precedent or underlying net that isn't; too, it may have a frequent commitment harmonious with (there may even be certain reinforcing circuits) such motic eg repeated or iso-firing of some stationary cells: directional movement (how discriminatory?) may have peculiar harmonics (what velocity-response curve?). By the way, movement creates interlacings with simple cells and so mixed curves for hypercomp cells.

The recognition of forms as complex as we do may indeed require these subtle sort of interferential circuital commitments in intra and inter hierarchies. Marvin Minsky localized corner and aspect counting fails to explain what is done with the aspects. A serial concept would assume that a tree is run over, but a relaxed banyon tree might be better.

· Diagonal or angular fields could be achieved by fibers; but what does cause them?

"The column is probably maintained, at least in part, by Golgi type II cells through collateral inhibition (Szentagothai, 1967)." Intercolumnar inhibition could replace suppressor areas and slow transcortic flow or render it dependent on bridging fibers (count).

The monocularly driven (versus other laminar cells) simple cells of layer IV may be deemed stellate; layer IV is seperative and initially driving: note that displacement is considerable so that formal diplopia must be disregarded, transcorticl passed, adjusted in situations (as in bilingualism), or indifferent to the mechanism (it would be interesting to raise an animal with an artificial perspective correspondito 5°-5°-180°--to more complex patterns (eg 'crystalline', ie multifaceted mirrors or prisms)).



columnar width? laterogeniculate afferentation isoregular or random?

Schema of neuronal organization of column of visual area I (area 17, striate cortex). A, axon of pyramidal cell; AD, apical dendrite; A-LGB, axon of neuron in lateral geniculate body; BD, basilar dendrites; G, granule (stellate) cells; M, Martinotti cell; RC, recurrent collateral branch. Roman numerals indicate laminae of cerebral cortex.

Re above. Visual experience semi-inhibitory (explaining one afterimage?), a la the cerebellum? Indicates training of spontaneous activity (explains some positive respont to deafferentation throughout the nervous system?)? Positive pyramidal activation = reticular activating system, plexiform interpyramidal, autorecurrence (eg axono-apical or axonobasilar), specific thalamic, collateral, &c. Or are eg pyramidal axons inhibitory, &c?

#### NOTES ON EYEMOVEMENTO IN THE NEWBORN Pat Gunkel

Note the sets are linear, averaging (13-1-1), diametricly fluctuative (note variable scatter and density, perhaps because of isointeractive diurnal or unknown-periodic fluctuations in cells, or panstiqular biocumulative averaging or dissonant -- note the role of dissonances), horizontal (1/3 base, but particular muscles, nuclei, and corticonuclear connexions may act-consider ways; other stimuli and orientations should be tried and statistically assessed), broad band (narrow and wide; may this mean the stimulus or represent a histologic optimum? May it represent a narrowing and perfection, or tooth-flattening, of random movements (just like a 'curve' describes heteroangular clusters of false micromovements -- an interesting delay with respect to any-cellular mnemes)), micromorphic eccentric multiple duplication (which could orientively drift and developmentally stabilize according to certain probabilistics , possibly motoformal or other histoformal interactions and reproductions (eg annulation of vertical fixative points-eg with dissipation and empirical recurrence-the seen and the done may compete--in 13-1-1), possible (eg harmonic, eg averaged harmonic) parallelogrami retracking (13-1-2?), possible hysteratic temporally complex (or task-focussing) antitheses (eg uncounting-arithmetic may be extraordinarily important and natural in the cortex, indeed, mind may be a labyrinthine or innumerable spring--which may explain counting cells, visual illusions, affective phenomena, nocturnal and oneiric and old age playbacks, mind as arisen from time, &c; ellipsoids, overshoots or mind as a simply impossible struggle for emergence, orthophilia and platonism, reflexual automatization and refined performance --- say with drift down the hierarchy of the nervous system or with K. S. Lashleyan or hippocampal generalization over the brain, reverbatory memory as in fact dissociated 'recounting' (one may assume that all cells are continually counting into one another -- the 'forwardness of time' may in fact be its backwardness -- or playing out of one another and therefore producing memory or an ordered capacity for memory)), curve (19-1-1), jaggedness (or subharmonic and subequalizedpandirectionally-lines), utilitarian any-centric configural motion (eg 19-1-2, which may cause isointeraction at an odd cortic points), &c. Too, various oscillations can be imagined, eg circumscriptions collapsing into a minimal or relaxed point (25-1-2?), and at times different forms ('remembered') might be composed (eg square and triangle).

Subject 13 Day 1 Position 2 13-1-2

Subject 19 Day 1 Position 1

19-1-1

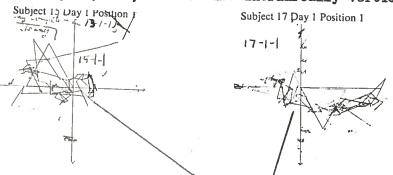
Subject 25 Day 1 Position 2 Subject 25 Day 1 Position 1 Subject 19 Day 1 Position 2 25-1-1 19-17

See 25-1-1. One can also imagine cells trying to build an object, eg by insufficient clues. This makes brain a stochastic-analyzer and means in this way intellect may arise; moreover, if these coded and self-coding strings could be propagated, then any denumerable piece of eg the striate could explore (eg details-details better than simple 'wholes') and participate in perception.

Since the saccades may describe any movement they can cause any point on convergent-divergent cortices to be equivalent to any other, and in this fashion (which might even be stressed by fatigue at successive levels) adaptive phenomena at higher cortices (or a certain entrant contribution to total oculokineses) may develop—recognitive fixation the same as the striate, particularly with competing groups, led on by contiguous phenomena at regressive levels; eg isointeractive recursive intensities at the striate resolution may be one component in a higher cortex that initially has to learn topography and myography. Another idea is that excited primocortic inhibition of higher cortices may cause those cortices to compete for displacement, and such antagonism may cause the lower cortices to evolve less self-excitory behavior (in the sense of new behavior, because higher cortic any-point inhibition would sculpture juxtacortic—or inverse corticofugal—deemphasis; at some point the dynamics of the lower cortices could therefore become quite complex; the same habituative—reemphasizing

adventurous phenomena might occur just within the primocortex; moreover, texture and other forms may now start to be analyzed, eg the population of analyzers may now become large and complex (but, since the eye is solid, smooth) and possibly competitive cancellation as to oculokineses occurs and the responsibility is shifted to a higher cortic level (which may now develop, especially as being more difficult to please ie satiate). Peripheral vision involves slower cortic traversal (more distance between cells) which could stress foveal intensity, blur, peripheral stability, or fatigue (or an adjustable mean).

Lower cortic inhibition of higher cortices (or intercortic) could have the interesting effect of imposing 'cages' or obstructive barriers to transcortic fluxes—a line or a texture could involve a sciagraphic noogeny. What cortices could serve noogeny: single areas, cubes, two areas with lenticular connexion, two areas point—randomly connected, several areas, some stochastic order in the blur, some 'microscopic randomization', an ideal infinity of layers with marginal, arbitrary, or shuffled differences, &c; too, what occurs intraareally vertically and horizontal



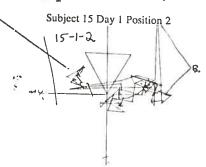
Are these isointeractions (13-1-1, 15-1-1, 17-1-1) on the cortex, eg a form seen at one point (and most effective during least motion because of time, threshold space, and perhaps autocell and cellcell interaction, and so naturally stabilizing, eg 'regressive' introoscillation would cause the oculokinetic mechanism to acquire (i) fixation and (2) resolution; conceivably tremor would arise to obliterate adaptation -- and even measure, eg by vibratory regularization, eg least aspects of stimuli--also to maximize effect by exploiting optimal cell number, perhaps per optimal firing (check) -- the lines would come to be 'fixatively' followed because trajectory maintenance (cum ideal tremor) would maximize isointeraction cum some source of further motion (eg refinding, or per 'long' adaptation or habituation, setting forth on a new line (which might be preferred as angular for the sake of a new cell group, or perpendicular. It is possible too prolonged a stimulus trigger aversion by some intrencephalic intensity (relativisticly, in the supersimple world of the tabula rasa neonate, negligible differences and summations could be subjective enormous, eg a tiny sound could be virtually deafening or there could be no gradatic of sounds in the sense that the largest would be perceived first (which in visual motion could paradoxicly be the least--eg least motion) but any stimulus would be ultimate) (perhaps acetylcholine and motoral summation, eg with distraction from

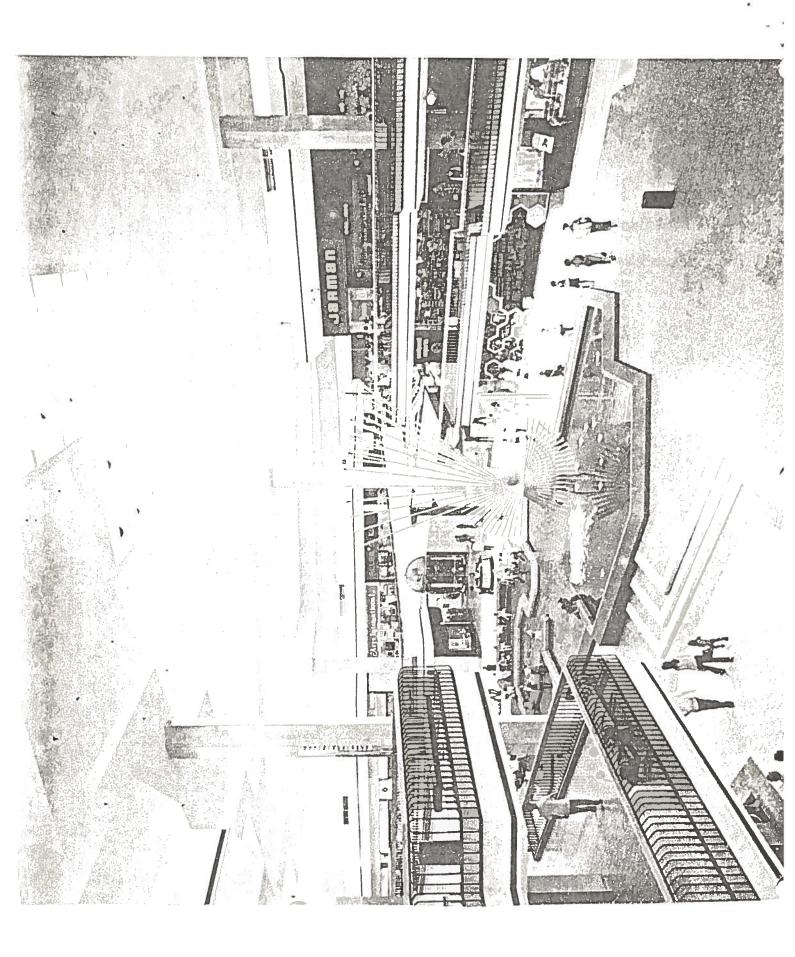
restful pleasure), which could be the origin of pain, and could be antipolar to normal or just balancing pleasure, perhaps found in some equilibrial novelty, and then an ideally orthogonal or acute (reflective) angle could follow).

See 13-1-1. Tied to vertex and average axis (perhaps two cell groups ("A") are active and orthogonality to the resultant base would cause its detective

negligibility and hence the choice would be optimal).

See 15-1-2. Recursions or reversals like this ("B") could easily be reinforced and 'instantly' axiomatized (overshoot might be asymmetric by the value of the neighborhood: movement might be sharply controlled: this would be stochasticly easy for the cells if it were probabilistic).





## "AN INITIALLY VACUE DESCRIPTION OF HOW A SCENE IS RECOGNIZED" Fat Gunkel

One has to start somewhere, as does the brain, and so in this paper a tentative, partial, early, and hypothetical account is made of how one picture of a scene is 'recognized' by the brain. It must be obvious that, eg on the basis of principles I have put forward elsewhere, a brain many years old will long since have developed administrations that are by no means obvious, retrievable, or even formally decidable; eg it must have in its repertoire a number of "circumventions" developed by retrospection or simply representing "saltations". What is always impressive is the alacrity and equity with which it is able to recognize things, so that instances of relative slowness, even when they seem to form classes, seem an unrelated and inexplicable matter, or a form of "pathology". I know of no psychophysical attempts to find and measure real or systematic differences between rate, degree, kind, situation, &c of recognition of various stimuli intrinsic to the stimuli, eg in terms of the relative type, complexity, context, interrelation, isolation, basis, definition, simple attribute, redundancy, interference, purity, originality, &c of the stimuli, eg within evoked potentials; some things suggestive of this Mio direct, thorough, and beginning work; this is merely in reference to static and plain stimuli, much less a continuum to stimuli and recognitions at the limit of regularity and metric dimensions. At the moment I put forward no hypotheses or venture any predictions of theories; this effort might be interesting but unfinal. It is uncertain to what degree appealing accounts of how things are recognized, such as this (eg drawing their appeal from randomness, comprehensivity, maniness, elegance, interest, simplification, analogy, &c of apparent account), are beyond a point illusory or insignifigant and indecisive of what the brain does or especially of how it does it, which is akin to the danger of rationalization and a posteriori explanation and the odd truths of the multicausality of things and the multiplicity of explanation as performance. Still in all, exercises such as this may relieve the tension of the belief that the mind is in some sense inexplanable, dark, and forbidding and cast some game into the arena that are encouraging or even the proper conquest or a facet thereof, even if belonging to a quantitative myriad of facets.

Small letters off in the corner of a picture are marked at each point as to internal position and thus structure by the biaxial conformation of cortices and a long history of spatial learning crystallizing in the cells associations of absolute and relative position, eg converging to, of great precision, redundancy, reliability, diversity, &c. Eg the vast collections of textured movements in the history of this tissue, whether of the eye or more nearly external, surely deposited ready routes of coordination whereby kinetic and parallactic lines will substitute as determinants of the linear structure of the contoured areas of these letters in a word; indeed, an angular process of comparison must have gone on to stress and then assemble

in recognition of proper configuration here.

Now it can be imagined that the total arrangement of representative configurations or random continuums will since have evolved in successive cortices a correlative structure on the basis of the comparison of all the products of the vergences, in response to the same and variously different forms, with each other in the cortices where lateral or interareal interaction is possible or in terms of the invariants in the relations of the cells with each other vis-a-vis the external objects; this total structure will be of sufficient complexity to discriminate different forms as to metrics of similarity. The product of these identifying cells might simply be dispersed but regular "tunes" telling of the general inherence in an object having any flat or depth orientation or any size. To the notion that rotation in depth will attach special problems (and likewise distortion, &c) it may be answered that the set of descriptions of the object or of the totality of past experience may be of adequate complexity that a multidimensional averaging over and integral selection from without the diversity may give a linear convergence between all forms and orders of experience; moreover, specificly the plenitude, reliability, and redundancy of the signs of the degree and kind of slant, &c may supply easy terms for the integral correction of the rotatory inequality of different examples of forms. Especially will the tissue have established 'absolute references' for the coordinates of space, monotonous gradients of values (as of shade), &c so that the peculiar gradients of shading, & visible in the objects will be reduced in the gradients to a description, all this being modulable by the set of indications operating by the total average of experience on all possible discriminations; but the tissue may in that way be extraordinarily (if semiconsciously) perceptive of the complex description and classification of gradients and multiple gradients and multiple objects under gradient availible in a scene. An important point may be that nervous tissue does not concern itself with particulars but with generals, so that particulars are subfunctions, subsistents, or complex arrangements of generals, and differentiation does not occur but by the analysis, provision, however you will, of generalities, and so that further generalities emerge from generalities and not otherwise; thus what all the random continua or representative configurations or cells scattered around a tissue would be looking at would be exactly generalities, which would answer the problem of rotation changes of identity, and the like.

How might this scene be analyzed serially? What goes on in a tachistoscope? The problem can be approached as a successive deblurring of the eyes, whatever distortion appear from temporal disrespect. Sets of possibilities may be suggested from the sheer (even fused) color of the scene, which after all is a complex and specific spectrum of hue, saturation, brilliance, multiplicity, and choice well able to discriminate continuously between and within the variety of experience and conceivably in this case, tell as much as that this is an indoor shopping center with such-a-such structure! All detail erased from the scene, the gradients across the scene or just centroperipherally may, in their multitude, tell such a story, only more so. the angular, zonal, and linear structure of the scene may come into view and narrow choice; predictions from memory may refine discriminations by seeking and organizing unique signs. The overall structure (eg massivity) and range of sizes (with its specific distribution) may identify the perspective and scale, giving all kinds of discriminatory predictions, and even when individual elements are hopelessly lost in the blur, they appear by interference effects if the elements form regular collection If now the time dimension is considered or focused in on, the image otherwise being perfectly clear, the identification of a single detailous figure or body may tell a great deal about the rest of the scene and draw on the above early discriminanda. may be that the above interferential recognition, so-called, signifies a Fourier comparison of objects and Fourier basis of perception in generals, since I would gues it appears via the superposition of nevertheless regular blurs.)

It may be that a nidulus receives patses from the constant variety of experience in such a way that -- through the intervening cells, the angle of the inputs or path through the neuropile, the very structure of the experience, &c -- the variety is classified distinctively in the various cells of a column, &c, so that automatically, in a purely positive way, the possible patterns of experience are seperated, and the recurrence or near occurrence of the structure or aspects of the structure, within the foregoing complexity, leads to peculiar or quantitative record by the nidulus, or a record that would distinquish between alternative structures or even, combinatorily, say something about the nature of the structure (eg variations in size, angle, length, intensity, degree, &c). Then one imagines all the niduli doing this classification simultaneously. In this way, or by secondary niduli, any experience would be so deeply analyzed that eg universals could emerge by their being consistent in the continuity of objects despite the other changes, would cement patterns of cellular activity that were in this way both analytic and outstanding by sustaining analysis over variation, or eg simply shapes undergoing these changes would still have some unchanged representation in the variety of patterns open to the niduli, even despite translocations of the object; or on the other hand all the cells or niduli might get activated by the pattern of presentation of the objects because neural activity would spread, but all the while preserve in a direct or transformed way the structural characteristics of the object adequate for recognition. All these possibilities are not a little confused as it is difficult to choose among them momentarily, if, indeed, the overactive tissue does not in fact draw on these possibilities indifferently or multiply on the same or different occasions.

If one imagines a Fourier analysis somehow transpiring in the tissue so that all the spatial frequencies of an image under presentation are undergoing representation and comparison in the various cells with the imaginary frequential 'rings' serving as the generalities classifying particularities, say by the division of points or shapes between the rings at different loci, then translocation becomes a matter of potential indifference and there would remain in this tissue the various emphases represented by intersections of rings in given cells, with the possible structure spread over the cells as only slight differences between loci by major differences in the annular and intersective spectra, representing a random continuum indifferent to location. The property may be here that all Fourier so-called frequencies will constitute a random continuum evenly spacing a galaxy or universe of possible intersections or set of order-having configurations; any object would have some representation in all the cells, niduli, and possibly configurations and hence, as said above, generalities and not particulars would be the matter

of recognition.

In other words eg the initial dissonances created by the vergence would be followed by consonances or a unification of the dissonances with an immediate and developable emphasis given to the structural variety of all objects of experience, say modulations "carried" on the new consonances, consonances inter alia emerged from the various overriding regularities of the tissue, of

the physiology, and of the order of the experiential world.

Since in experience tendentially objects moved continuously, regularly, and enduringly across the visual field, and since the interrelations of cells and cortic areas overswept by pulses largely remained invariant, the tissues involved would very soon and lastingly embody in themselves comparable concepts of order, of gradience, of division, and complex and potential scaling, &c. So this means that the tissue would have no trouble in effect remembering the spatial relations of parts of the visual field and of objects seperated functionally by the decussations and other minute flows of information over and within the tissue. Thus an 'automatic' rescaling of complex analyses or

"structures" would occur uniting the possible elements of structure with the absolute spatiotemporal geometry or concurrent invariance of experience.

Along with this "geometry" of external and internal experience and of the spatial and temporal analysis of the material of experience for "structure", a third group of elements serving recognition would emerge and readily be integrated, such as the so-called primary sensa of color, intensity, perhaps vibration, aspects of the visual depth mechanism (convergence, accomodation, textural overlaying), &c. It is obvious that purely by the unalloyed tuning or setting of these primary sensa highly specific combinations could emerge, as described above, and contribute in the guidance, firming, and further discrimination of the other elements.

By the competition of different types of reinforcement (condivergence) closure and finite figures would be emphasized and thus developed in recognition, as in the tendency to bound and interknit sensory homogeneities, and regular scaling contours could surround the 'mountains' of experience in topographic maps whose organization would serve as the subject of the random continua in their evaluation of forms. Indeed, the key to such organization might be the presence of some mixture of heterogeneity and homogeneity or perhaps of irregularity of what is regular or known experience providing a means for grouping cells into memorizable groups, or one might say that cells experiencing homogeneities would have a tendency to bind their activity together homologously heterologously, or multologously. This might serve the spatial conjugation of a scene and the definition of its spatial arrangement or recognition of figures present.

It is conceivable that the possible "rhythms" generated by specific figures would be skewn over into adjacent territories so that the scene would in fact be a bidimensional continuum of skewed rhythms or rhythms skewed over borders. It is apparent that at secondary niduli where punctal rhythms would come together the superimposed and locally dispersed rhythms would be able to match off to one another as to similarity, say by the superposition of isorhythmic figures seperated in space, and as to dissimilarity, say by variations in those rhythms or by cross-spectral competitions and similarities between heterorhythms represe different figures or figures sources to the rhythms. Now Fourier analysis may be done of "intersective" properties held minutely because of a random-continual analysis of all figures, at the point these rhythms converge. In any event it can not be said too often that these are not single and unique rhythms but compl collections of rhythms nevertheless regular with respect to their source and the source in the tissue, thus the discriminations of similarity and dissimilarity, and typogeny, would take place within the fantastic variety of random continua and would involve a sorting and cosorting of all aspects of the figures. It may clarify things to say that to the extent the rhythms are single, their specific elements would be immeasurably complex and specific (on average, where the tissue (by "cross-familiarization") employed nothing but functional multidimens: averages) (so that the peaks would be unequally spaced within the virtual histogram, their amplitudes would be incredibly specific as also their interval: the "peaks" would in fact be an analogic amalgamation of peaks or contours or pulses, &c), and it would be this specificity and complexity that would be analyzed in the crossrhythmic association in so-called secondary niduli, and elsewhere.

Among the shapes that may emerge in a tissue by condivergence, &c may be identiques like 'perfect lines', 'perfect circle', 'perfect sphere', &c; eg the circle may emerge because disorientation can only occur around 360 degrees and the excessive manifestation of this simplicity within experiential variety will lead to "continuous classification", inhibitory or other condivergence, an the valued assessment of all other shapes by this one or "appointment". Likewi may all the types of order in experience and their contours of combination becomidealized and generalized over all further experience.

It may be that a certain amount of simplification can occur in recognition and it is interesting what must be the processes that follow some criterion or degree of recognition, as in the prolonged study of a scene, say serving memorization. It may be that once some aspect or part of a scene is recognized or an example of any element is found that the mind then, perhaps literally, springs on a trajectory the identification of other examples of or variations on that element or of the degree to which that element occurs. Hence once a ceiling is, grossly or locally, perceived the mind may pursue questions of its range, congifuration, details, variations, substance, messages, supports, parallels elsewhere in the scene, &c; once one person is recognized, others may be sought with similar considerations; once a general or particular scene is recognized, others in the wault of memory may be raised for further gross and detailous comparison and mutual discrimination; once the familiar nature of a scene is recognized, novelties may be traced and the observer may ask himself what he shall do in the presence of this provision; possibly the mind may seek out ways of discriminating this particular scene from any that may come along in the future. It is unclear the degree to which these things hold,

may hold, and should hold.

Returning to the scene at hand, the following things can be imagined of importance in analysis and recognition. The coplanar floor, the coplanar ceiling, the parallel beams, the similar and coplanar balconies and their angles in space, the identification of connected, adjacent, and distant related or like elements or populations, the list of materials, the list of designs, the color scheme, the paths of persons or the 'ways', the clustering of the bodies, the distribution of lighting, the determination of the vertical and horizontal, the 'relief' of store interiors, the suggestions of categories of goods, the activities and postures of the bodies, the messages of the signs, the suggestions of atmosphere and ambience, the interrelation of levels, the dress of the persons, the list of possible functions of such a shopping center mall, the aesthetic design of the whole, the measurement of distances (size of space, height of ceilings, length of ways, conformation of seats), the overall and external structure of the courtyard including the axes of space, the analysis of idiosyncratic features and unknowns like the black cylinder on the lower right floor, the vents, the information booth, &c. One thing that is often not recognized in neurology is that the provision of synesthetic polysensory association areas in phylogeny, and their stressing, could at once provide a tremendous variety of forms of analogy between experiences, forms that could lead to infinitive spectra, to novel intellectual functions, to multiplexing spectra, to a dynamization of otherwise static things as well as their fluidity, to fluidic operations, to extended criteria of analysis of forms, to coupling of the extremes of forms (eg tactile vision could render inconsequential and/or abstract the size of visual forms, as well as leading to the solidification of forms, the transference of texture to an entire landscape (as in a circumscription of environment); contrarily and then reciprocally or synergisticly, tactile textures could then be invested with the vividity, plasticity, variety, extension and environmental incorporation, &c of vision), to a motorization of and bodily identification with experience (sensory criteria could become operational and in this way higher intellectual operations could have emerged or enlarged greatly, savage animism could be explained by the externalization of will--as well as, below, emotion and one's inner life; the operationalization of sensa could lead to the genesis of symbols (as in a new stressed hierarchization of things or inequity of sensa) and grammar (or especially as a modulation of a loop of consciousness, attentio behavior, feeling, &c)), and to an emotionalization of these things (as in an exclusion of lower and simpler affective and expressive routes, even some exclusion of lower sensation, possibly) so that eg sensa and personal acts would become regulators of feeling and behavior and ends in themselves.

### "RATHER SIMPLE EXPLANATIONS OF SOME IMPORTANT CONCEPTS" Pat Gunkel

Two or more concepts that I have recently postulated could with explanation suffice as a general theory of the brain. Though simple, these weren't adequately explained in their original contexts and this I essay to do now.

The foremost idea was that of so-called random continua. This strikes me as a very new idea in the entire brain literature. Many things are meant and many implications are had. It is widely felt that information is somehow "dispersed" in nervous tissue, especially in an omnicompetent neocerebrocortex, though typically in the absence of any further statement of the form and function of this representation and always without any definitive and entirely convincing treatment thereof; one is forced to use one's imagination, and indeed many men profess to be intuitively satisfied that dispersion is a fact and some method equally. A second problem of major stature revolves around and may derive from this dispersion, for it is not at all understood how a nervous tissue triumphs with universal recognition over the variety in which stimuli present themselves naturally: eg abstracts universal form from a cascade of inconstancies in position, orientation, size, distortion, obscuration, imbedment, velocity, intensity, color, and so on. The notion of a "random continuum", which to some degree answers these difficulties on its own or with some supportive notions, leans on what need only be a very rough or general neurohistologic landscape: that of neurons randomly connected to neurons save that a smooth broad slope describes an emphasis of connections about centers represented by each neuron, "hypsicentrically"; in the neocerebrocortex this takes the form of successions of areas projecting onto one another by long fibers such that a given point will have such a probabilistic central population composed of a sample of projections from another area approximately isotopically homeomorphic, at least in the vicinnity of primary afferent and efferent cortices. Not entirely clear in my mind is the importance of variations in landscape architecture, such as may be presupposed over the brain and phylogenically. The consequences of this partial divergence and convergence of points between fields are (i) that the homogeneous information of the initial field (as in the retinal map on the area striata) is diffracted into innumerable new possibilities of combination, (ii) that the range of clusteral configurations is extreme and extensive, (iii) that the range is also so intensive and fine, (iv) that the clusters, aside from being hypsicentric, are evenly random in their loci and constituents, (v) that these continua embrace both loci and all qualities, (vi) hierarchically and successively over time and projected areas deeper descriptions are natural, (vii) that a calculus of differences will abstract subtle homogeneities from heterogeneities, in a continuum, and that this continuum points toward the world of ideas or any plane of intellect, (viii) that the diffuse flow and incorporation of diverse information over the brain is no longer hard to understand, (ix) that-by the fineness, diversity, randomness, continuity, myriadness, naturality, basic uniformity, &c -- the information may be consistent over cumulation and accessible over experiential change, (x) that certain changes in representation-of supra-become trivial because of the overdominant diversity of disjunctions and transfigurative new conjunctions, (xi) that the differences between perception, thought, feeling, and action cease being problematic, (xii) that all sensa or neural events acquire virtually linear relationships, (xiii) that whole environments may be learned "unidimensionally"-with only ranked disturbance of subsequent novelties, (xiv) that all sensa or neural events are intercorrelated or "transcorrelated", (xv) kc. "transcorrelated", (xv) / &c.

The second major concept was that of condivergence. Borrowing on the peculiar diversity of random centinua and using a neuromechanical scheme it showed that probabilistic ranking by an extremely effective, "large" set of classes may create a conceptual hierarchy, such as gives man his intelligence, by pure sorting. It vertically and horizontally differentiates experience and enables random access and great mental complexity, as a progressive conformation of neurons and pulses with the heterogeneities and homogeneities of experience, a capture of the probabilistic interrelations and order of the world. Generals are extracted from particulars, spontaneous general patterns occur, and a dispersed and pointillistic memorization advances. Logically speaking, "subthemes" and "deviations" are allowed to appear and assume natural importance, eg in disturbance of the 'whole', along with association and synthesis in an integral pattern of consciousness.

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The occasions of sensation are so different, both for same and different forms, that random continua, stratified at their level, will long since have captured complexities and specificities far transcending the elementary dimensions of differences (that are the dramatizzed concern of present neuropsychologists); this refers both to minimal and maximal (responses of representative configurations.

Random continua are "diagonal" to the terms of classification, both the vertical and horizontal elements.

Typical contributions to random continua:

"specificouniversality"

Therefore the typical averaging for random continua or jus "scatters" will yield complex formulas as straifications "transverse" to particular types or instances of forms—yet highly specific: Secondary convergent scatters are the in an ideal synthetic or euparallelistic position. Tertia scatters could only-naturally involve the interplay of the syntheses, as in arbitrary and dissociable (yet thus more abstract) combinations.

# COMMENTS ON THE DISCREPANCY BETWEEN PROBLEMS OF HEARING VS SEEING Pat Gunkel

Obiter, it would be extraordinarily interesting to see what would happen if you raised a chimp having only the tremor movements, as to his perceptual attainments and the peculiarities of limitations.

An imagination of events between cortic areas 17, 18, and 19. representative configurations in 18 from 17 would be figure-distinctive over a seperative continuum, bis. The representative configurations x intelegence in 19 from 18, however, would be clusters of clusters: but note that cerpours the groups of sampled figures would be both 'small' and consistent and lodged in a continuum. The sources of the area 19 niduli being diffuse, there would be a certain interest in forms independently of location, of movement, and perhaps some other things. Now it is conceivable a local or intensive process of condivergence could have led to metaorientation in niduli by virtue of inhibitory averaging and generalization over rotation of the same figure -- that is, the ideal figure ("dispersed" over a continuum) given by the structure of the representative configuration (furthermore, perhaps otherwise, an interferential mechanism working intranidatorily could be rather uninterested in exact or any rotation, or interested in both; now of course a similar mechanism could work for size-discrepancies of sensa with miduli and inter se (and could perhaps be smoothed over a continuum), and for size-discrepancies in the sense of a ladder of sizes of nidular fields or, better, successive cortic areas). At some stage one might begin to look for more complex temporal analyses to emerge because of the foresaid diffuseness: eg the temporal extension involved in movement could lead to a unit of metalocation in oriented cells as in the cells that are called "complex". It is conceivable the rigidity of the tissue leads to only a very slow and regular breakdown of specifities, as in "hypercomplex cells".

It is worth asking whether a filtering might tend to occur for anything more permanent within the more complex analyses tending to occur: after a number of colls, number of areas, or period of time responses actually invariant after these transformations could be raised to the top of a functional hierarchy and, moreover, these rankings and elections could change over a period of time in a search producing or in the simple production of most-invariant transformations (therefore also most general; there could be something like a random-continual residuum or perhaps history, whereby old possibilities would be subsumptively retained within the full differentiation of the latest tissue—this could lead to even-spacing, say within the types of order (in other words, or further, habituation would lead the tissue on to explore different types of order or concepts (conceptual development, supposed leading to the ideas man uses))).

Obiter, one type of partitioning would assume that a tissue just naturally tends to get broken up into or to form into or consolidate a hierarchy of agreements between cells; now it is possible an aspatial 'tissue' of many types of agreements or many hierarchies between cells with many possible transitions might tend to form; it is unclear how

such a tissue might tend to change over time, or whether in multiple ways—such a process might or might not focus on local or on dispersed relationships (see the 68 types of memory classification for analogy), one can imagine some stress on isopycnic ranges or structural ranges thereof, say with the pole on some modulus of greatest eveness of spacing (in fact, this creates a random continuum, perhaps additional to others).

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One can imagine that in a high or since-converged area the choosing consideration might be, through a focal interest in the whole (perhaps in self, through integrocorrelative intraconnexion), the relative

predictability of response of all the cells to the form and, obversely, of the form itself, the form and the forms of course being those arranged in natural experience or the consideration for prediction being the variety and character of that sum experience. The two antidirected, processes of convergence and divergence could be polarized about that experience, centrally; so there would be favored, concomitantly with any tendency to homogenization,

a tendency to differentiation in orthophenomenologic criteria.

In sum, how would this predictive idea work, this Darwinian evolution of predictions? The prior structure would have analyzed visual experience by random continua and condivergences. What might be a tertiary cortic area would then predict the nature and future of its input--which might of the input diverged or diffracted to 18 from 17, and converged from 18 to 19 so that the forms or possible analyses emerging in 19 and thereafter would be a function of the extent of the neuropile -- conceivably moderate or universal lateral interaction and intraconnexion in 19 &c would serve an insurance of homogenization or an infliction thereof for the sake of integrocorrelation and whatever are its resultants (discuss elsewhere; one possible function might be temporal unification and sharpening for the sake of the subsequent generation of temporal analyses through intertemporal contrasts). In any event, and between these two things (space and time), the convergence in 19 would serve an analysis of the 'essential' structure of the momentarily or enduringly seen, a synthesis of scene, perhaps with respect to integral scenes given as past moments of time (as in stases in oculokinetic intervals).

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## FURTHER COMMENTS ON VISUAL PERCEPTION Pat Gunkel

If the contrast on a picture is reduced from 100% to 0% some rather interesting things happen along the way. For one thing, a 'window' is involved on the sides of which excessive concentration of shades of black or white remove features. Another spectrum is that of time, from the tachistoscopic instant to the moments thereafter and the unending persistence of a picture. Clearly this and the following spectra involve each other. One may imagine different zones and levels of processing will give some recognitive structure or, that is, some preperceptual dimensional pattern able to be analyzed for perception, in a more complex and useful way than is immediately suggested by looking at a picture in order to judge how it is perceived, which may be deceptively simple. It is quite natural to suppose that the act of perception may variously go through, and even have or develop complex mechanisms for the simultaneous or adequate

analysis of such pictures. In this connexion, very many peculiar questions must be asked about, for example, whether (given that perception has a certain course over milliseconds which should be determined and considered) a picture is progressively analyzed in terms of going from smallest, most compact, most symmetric, most homogeneous, simplest, &c features on through those at opposite poles, or whether certain mean sizes or, on the other hand, certain collections of sizes, shapes, themes, &c in some average but superficially meaningless "stereotypic" perspective are used first, particularly, or at all. Returning to the beginning, a window may across or even back-and-forth such a spectrum as contrast, and on this basis supply the tissue with a certain group of collections of censuses common to which there may be unusually obvious or the important themes used for perception. In any case, along the contrastic spectrum or eg near minimal contrast, a pole giving one hierarchy by the stratification of features as this pure approached and/or/and left, will stand forth signifigant features such as configural lines; it might be noted that likewise homogeneous planes will stand out, succeed one another in supra- and infraclassificatory planes, give threshold lines that will move over planes as measurements of intensity and descriptions of planar curves, &c. In any event, it is interesting what a difference attitude makes in perception, eg whether a subject believes that inkblots are or contain real objects, scenes, themes, &c and regards them as all-important; thus natural conditions of perception may be ill-replicable experimentally and it may be that a tremendous concentration and acuity belongs to so-called minimal and abstract presentations. Therefore in normally skillful perception the temporally first bare signals may involve a field that could be anything, or rather a field organized for everything in a linear series of probability, the very first signals may contrast these possibilities in the following way: infinitive importance may rest on the first features aspects (there are signs of signs of signs of signs) such as precise line length, uniformity, width, plainness, orientation, curve, figure with other lines or features, &c; infinitive important and transformation may lay in nonselective or selective gradations as the 'contrast' changes, such as the emergence of new features, and especially on the total process of the manifestation and integration of the overall picture; this process may be an extraordinarily rigorous decisional tree or an extraordinarily large and precise arboreal matrix or an "anastomotic matric net", that may be generated not at once but over the lifetime. To the objection that details would be too few to allow the isolation of invariants over the scenic alternatives, it may be replied that neither is it known how much detail is required for this nor how it is done with respect to the nature of the sufficient detail. The work with so-called gestalt laws and development (which is extremely incomplete) in fact argues that such a process might be natural and the case.

Likewise there are spectra of brightness (the initial picture may be very bright and/or dim, obviously or functionally), color, and in fact every imaginable type of order (as these are synthesized or imagined). In terms of the above and any spectra, in addition to the extensive range there are intensive details which might be variously used and deserve study; especially detail through reversal.

But an extraordinarily important aspect which also is spectral is focus. passing, it is rather interesting to imagine a tissue such that over it each point would have its own lenticular focus, emphasizing center over periphery, so that millions, billions, or howevermany idiogradient microfoci would apply themselves, say with the accompaniment of a polar spectrum over time in the center of focus or however, and then combine in temporal synthetic spectra, say via a decisional tree or one of the aforesaid mechanisms. In any event, the specific contribution of focus and some or continuous differences in it might well be that it, in contradistinction to the contrastic process, would be principally indifferent to lines in the indication of forms or areas. In the same process of going from 0% to 100% to 0% focus, or the like, a hierarchy of designations would appear and perhaps be exploitable in ordered and/or idiosyncratic ranking and integration by decisional tree, matrix, and/or net. Likewise here and elsewhere we would have a continuum whose operation may formerly have been disguised or whose potential may not yet be understood.

Therefore by the combination of these two, or any number of, aspects or spectra such powers may be availed as additive or synergic integration of figures-by-line and forms-by-mass/homogeneity, or the like. Moreover and maybe in addition, topologic properties may be abstractable or generalizable (say by the above minimalist criteria and the employment of such mechanisms as trees, matrices, nets) in a comparably simple and obvious way (such as a, eg concomitant, tendency to closure of all lines and servant organizers (and remember that, as above, all criteria may appear holistically, and thus surprise one by their fact, nature, organization, and power) such as criteria of curvature, localism, net value (eg after gradient reversal, as above), microstructural (detailous, intensive, however you will) textural lattices donating envelopes, subcriteria of corners (such as spacing, interfeatural or situational salience, hierarchic and discontinuous fewness, projective correlation, angularity, clinic complexity, slope complexity (such as start, simple and complex curvature (which we may not now even know about), finish, point, homomery of the minimal enclosure or polymery of the corner, minimal straightness or regularity, continuity, regular meric gradience, &c), &c; roles may obtain for the synecdoche and enclosure of both lines, patches, and whatever else). Obiter, as to topology, qualitative topology may mean that by various criteria as subtle as the above a picture may be collapsed, topologically transformed (over a spectrum) so that eg holospectral or merospectral qualities such as color, size, texture, even shape, &c may be be bunched or united transpatially and intracategorization proceed therefrom (note that algebraic processes may occur; that is, any elected quality may be dimensionless and assigned an arbitrary operation (ie any of these things may be arbitrary); these things are not trivial, especially because the tissue may use groups and fabrics of various algebraic and nonalgebraic processes simultaneously and may in this way be exploratory). The answer to the protest that this or any of these things presuppose excessive, arbitrary, or uncharacteristic subtlety or complexity, is always that that appearance is or may be ideal, temporary, r/&c and that such bases may simply lead to a very economic or particularly exact mental operation, an operation typically buried under a mass of speculative and secondary mechanisms or amorphic in appearance. The preeminent fact remains that the first milliseconds of protoperception are evidently critical, are fascinating, raveled, and unknown and in fact the first microseconds or the like may have the same said of them, each of these things deserving underlineation.

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Some really great tachistoscopic experiments can be suggested because, for one thing, they could well decide the brain's perceptual mechanism. Eg what would happen if one varied or transcended one's tachistoscope to the extent that trains of images were presented with false and real gradual changes or partial identities in successive images, both structurally and meaningfully; moreover, these things could be combined. Always of interest is prolongation of tachistoscopic series and sittings for the sake of developments upon fatigue, and total variation in the range of detail per image. Now let us say the object was the intentional and unintentional detection of some or any specific or general changes against a background of similar or neutral changes or uniformities -- an example being the quickness of detection, location, and identification of such as a dot moving regularly or erratically about a picture (eg random location) -- and their discrimination for the sake of knowing the random but basic powers and means which are only perception or recognition. Suppose we combine with the tachistoscope our interest in what would happen if the frequency of images was increased independently of or in relation to their brevity and variety, or the specific purpose of the experiment; of course we want to explore the extremes of these situations by having the greatest variety of these or the above images follow one another with imperceptible velocity (of course what would happen if the velocity exceeded the threshold of consciousness in the senses of two trains of sub- and suprathreshold images interacting, two individually subthreshold trains together suprathreshold, two at the threshold, variation about the threshold, &c?); what would be the selectivity, heterogeneity, coadaptation, plasticity, reference, hallucination, moderation, &c of the brain? The same can be suggested where the given oscillations would be to degrees redundant and the oscillations vastly multiplied, with or without changes in frequency, in an examination of intercalation. Suppose that the successive image in whole or part is translocated, size-varied, 'fuzzed' &c, distorted, varied systematically (recolored, reshaded, run through contrastic spectra, &c), &c--what is the systematic effect on the quantity and quality of perception? Likewise this suggests an instrument wherewith images would be simultaneously superposed, tachistoscopically or not, say in very heavy layering or with specific choice of materials for the total melange or any of its 'layers'. Even where systematic or quasisystematic, and measured, predictions and conclusions are impossible, much intuitive science could be done and result in brilliant insights. But returning to the beginning, it would be extraordinarily interesting if regular or average continua could emerge eg so that a stepped or continuous scale would have a slope for tachistoscopic duration, frequency, &c, as to degrees of perception, and, a fortiori, tying complexity or type of image with the velocity of perception, implying some binomial minima, some multitypal complexity, or simply some extension, smoothness, and direction of the binomial relation. In terms of the original discussion of this article, one might tie this to the fact and nature of all and any of the previous mechanisms or phenomena, such as to the qualitative minima of stages of perception, their content, and their organization. In passing, other interesting experiments could involve the absolute trainability of tachistoscopic perception (re duration, frequency, &c), an effect of eg isopycnicity, the curve for criteria and conceptual complexity of images eg in interest whether conception is basically different, &c. Of course one wants to know how the duration, frequency, complexity, trainability, &c curves behave with respect to whether they are apparently continuous and extrapolable or, on the other hand, nonlinear and terminal. The specific effects of semi-knowledgeable expectancy are also relevant since they may tell of the quantitative and qualitative (theoretically improper) heterogeneity of the investigative cues and the real sequence and particles of 'instantaneous' perception.



the street is frequency

## WHAT ARE THE VARIOUS WAYS IN WHICH A PERCEIVED SCENE COULD BE KNOWN? Pat Gunkel

(SIRTHING A METROLOGY MINERSAL TO VARIOUS VARIANCES')

The first consideration is that loci of particles would be carried on into higher cortices by the simple fact of the prior cross-familiarization of these cortices under the permanence of their overall spatial and even functional relations and the overwhelming spatial logic in the array of experiences having come before in the lifetime. Specific cells or, put otherwise, specific space relations (bear they on location, rotation, discontinuity in motion or structure, &c) would serve the identification of loci in the same fashion as do servants of color in occipital cortex, representing peculiar retinal cells. In this manner apparent changes in location owing to receptors, environmentals, or dispersion, diffusion, decussation, or confusion in the brain would be corrigible and seperable from modes of processing superficially disregarding loci in their fascination. To look at a scene is to note that it is composed of parts or an overall texture inconsistent in its local, as well as distant, quantities of variety as well as by virtue of the various orders with which we are familiar and which doubtless form a hierarchy giving the orders without change (or the changes are consistent in the generation of the orders, with the orders the averages of the changes). So in an obvious way the eye is struck by, for the two cases two examples, patches of identical color and light, line-contours running about, and collinearities grouping the scene as in the specification of orientation in waves over a lake or, more complexly, in the frequential and yet multifrequential and multiangular collinear harmonies setting a pattern resolving into details in an obvious hierarchy, in the archetypal instances of a forest scene from afar with its bundle of tumulose trees and grainy boughs or leaves seen (in closer inspection) lobate, serated, and textured ad infinitum; by this complexly textured structure the brain is given thousands, millions, or who knows how many chances to identify and converge the overall and consistent thematic construction of a scene or such a scene appeared on the cortex. The brain may be able to resolve objects of any size presented individually in early life, but with ontogeny may occur a progressive ability to simultaneously and overlayedly perceive a progressive complexity of mixed sizes, patterns, objects, and meanings, so that very complex scenes become comprehensible. Why, if the macula and periphery of the eye are fairly discontinuous, do objects become regularly less clear from the center to periphery of vision? Is the former more continuous, is the continuity unsuspectably extant on the cortex, are the transcorti connexions less efficient peripherally, or is there some functional or processing favorance on the center of vision in the cortex (say through reticular dependence on foveal activities, a centrocentrism of eyemotions, a derivation of formal definitions from the fovea by a process of knitting, or, returning to the third of the former, are the horizontal plexuses or striae denser and broader in the foveal cortex, &c)? This relative homogeneity or, put otherwise, heterogeneous homogeneity would simplify the criteria for involved cells and inhibitory habituatic or differentiation would be precedent here; throughout the tissue, this latter activity would distribute itself in a manner corresponding to the degree of homogeneity. In any case, homogeneities would easily drop out or shift into a different-common for the homogeneity and 'uncommon' over the tissue, phase, frequency, fineness, or what ever and however (yet measured over the tissue in terms of size, essence, consistency, loci, &c), vis-a-vis residual comparativelyheterogeneous concerns of the tissue (as in the heterogeneities between or within homogeneities, the matters becoming the differentia in conception) (this process might be called "vacation", especially if its clearance of prior things, especially successively, is necessary for computation of residua or the operation of ratherfaint high traces or for the onset of nonfaint but substitutive operations:or transformed traces; on the other hand, the traces might not be functionally faint if the postprimary areas involve pulse flows and structure that has already, in the lifetime, arrived at great delicacy, eg responsively, with the effects in these areas then being faint or massive (a 4-matrix)).

#### AN HYPOTHES IS ON VISION Pat Gunkel

When an eye is at a point on a scene the texture of the scene will be analyzed by the cells. This means, in a simple sense, virtual waves will spread from every point on a scenic figure or from every point in the scene, accordingly as there is discontinuity at each point or accordingly as the values over the discontinuity differ in cell firing. Viewed from any point, these waves will serially reach the vicinnity of the point and will there describe a static histogram, or perhaps a histogram representing the first wave fronts followed by successors until redundancy (or continually, as above) or perhaps just the first few waves or some sample thereof; the wavefronts will interfere with each other in terms of the emissive scenic figure on the cortex; on the other hand, it is possible that these fronts interfere with each other so severely that before they reach a point they will have become to some degree transformed, with however the production of waves still adequate for recognitive processes or perhaps peculiarly adequate as some synthesis, and possibly in any case there will arrive at all the points of the tissue a, perhaps static, wave pattern comprising a very complex distribution of curves whose periodicities embody the structure of the figure in what I have above called a texture. The scene being immobile on the cortex, the neural texture will be, as we will see below, oriented. Upon eyemovement the figure will be displaced vis-a-vis the former coordinates to a new static perspective embodied in the new fixation for such movement, which is the constant of vision, has the two properties of consisting in pauses at new angles and distances. What effect will this have on the wave patterns received by any point? It will will have exactly the effect of regular transformations, enabling cells to learn to transcend patterned transformations as, in a sense, neutral. It is a little like slopes were to be inserted into histograms (representing celerations, segmental transpositions, and negative numbers in reversalsthe angular changes, the eversions, the inversions, and the law of distance). The isolated question might here be asked whether and if so with what difficulty can a tissue learn celerations and other mathematical transformations if these are densely, invariably, regularly, and simply represented in all its experience? The answer, one feels, is a strong yes. The effect of this would be that movements and especially jumps could leave transformationally invariant textural sensitivity evolve in a microcircuitry. It is a little like the waveform could now run up hills. From this and/or similarly the tissue could develop a certain indifference to such distortion as represented in sets and intertransformations of square, rectangle, rhombus, rhomboid, trapezoid, and trapezium (a cruder reason could be there myriad cells would interdivide, commonly, all rotatory, sloped, and structural criteria in combination with all textural criteria, and then eg yield an average upon convergence universal and invariant for the transformations), harvesting other details basically invariant over these substantial uniformities of transformation. It must be recalled that the ordinary complexity of percepts is not so simpleminded as the previous geometric figures so that they exaggerate the ambiguity of experience. (Obiter, the importance of foveal corepresentation, especially in some areas of the cortex, could mean that an essential coordination occurs between paracentric structure and central movement, giving "centromorphic analysis" or a derivative construction of the periphery and visual complexity.) It may be wondered whether David N. Hubel and Torsten N. Wiesel's "hypercomplex II cells" are not what would be expected as the orthogonal anomaly appearing where celeratory recorrelation of waveforms fails? In any case, the above mechanism could cause a universal continuum to branch from an invariance over these allomorphs:

## COMMENIS ON PERCEPTION Pat Cunkel

Ironically, part of the difficulty and/or delay in perception may have to due with refranation (by what mechanism?) of the brain from giving a response. confidence, or conclusion prior to an indefinite massive amount of quasi redundant analysis and comparison of a scene or a memory or at least some superfluity, the reason for which may be in the sake of the future, perhaps in the sense of a prediction of the complexity of the future, perhaps in the sense that the tissue is actually engaged in the synthesis and test of such predictions, say in the analysis of suitably 'large' units of 'time' (one of course is always in the position of guessing mechanisms for the mechanisms, although this is not always obvious). I used to get a kick when I was young at fixating meditatively on a near swatch of meadow and mentally excluding any particular stimulus from concentrating or snagging my attention and developing (evidently this happens all the time) for the consequence that timiest simultaneous absolutely innumerable changes due to intersections of weedy blades and appendicular movements of countless (previously hidden) insects then became obvious in a universe-telling-a-story. Likewise at controlling my mind in bed at night so that I caused myself to see precisely and consistently consistently hypnagogic images, since this resulted in an acceleration of replacement of images, an intensification of detail, an intensified change of detail, and a maximal variety and contrast of successive images, producing a stream of images such as two or more per second (or per instantaneous association!) for hours so that evidently there were ten thousand images in an intensive caravaning of the world of possible images and a sature of the notion of art as necessarily painstaking, slow, and complex creation in favor of the notions of the ease, infinity, automaticity, intensivity, and self-antithesizing nature of art, imagination, human behavior, feeling, performance, and thought; indeed, it might be asked what would lead to and what would be like a self-antithesizing and maxi-diversifying process, say in the arrangement of intellect. Similar exercises I noted improved my eidetic memory so that the very use, 'filling', and complicating of memory produced its maximization, its readiness, vividity, detail, flexibility, &c and burdens did not seem to burden but rather to lighten the load and complexity seemed to clarify itself; I noted as well at the time and used the fact that this application led to an awareness of or dependence on certain very subtle or seemingly very minor cues in everyday scenes as determinate of signifigance and management of that scene or, then, the process of thought as a derivative; thus it may be hypothesized that there is a relaxive tendency in the ontogeny of human intellect and progressions in the treatment of certain features. In passing, I always used to remark as well that the mind used some semiconscious "structures" and that these described any thought, feeling, &c of the individual despite the difficulty of their external reproduction, their eternal neglect in the literature, and their intrinsic subtlety, with the intimation that these structures (which, as I discuss in item #63 of "Order in Experience", may in fact be certain universal, simple process of intertransformat between supposed typical shapes with a quintessenfialization invisible in the shapes but well analyzing experience) are actually few, general, and universal in all mentality, and whereas I may not understand what I meant too well, the point may be that the "isotactic and heterotactic" pattern of thoughts and things may be similarly invisible cum decisive in mental process and recognition, as in the sufficiency of a moderately large set of associated elements inhering in percepts or as perceptual transformations (seperated here because infinitely repetitive or, otherwise put, irrepetitive self-transformative). In any case, both these things may represent an indication of the value of matrices, parallel processing, and alacritous serial processing (it is interesting and a case in point that the velocity of occurrence or processing may accelerate according as a process is finished or miniaturized (as in the vibrations of a bouncing ball compressed to a tabletop) and the brain may use infinitesimal calculi or even progressively organize itself so).

In fact it may be wondered whether the function of reticulocortic connexions is not in part, in the main, or exactly the inhibitory habituation or freezing of a particular overall tissual response so that a perception of discrepancy goes beyond simple recognition, self-transformations of a tissue are enabled, exact computation occurs, cells "lock in" memory by a diversified representation, potential recurrence, consistent representation, and the like of a fixed image or material, and the like; working selectively, two locked-in exogenous and/or endogenous "images" (say locked in by simple degree and time of reticular emphasis or eventual self-management of the tissue, say in processes) could process one another in inspecific detail or specific directions, as in some 'filtering' of subsequent input. It is always worth asking whether the frontal cortex, &c exerts such a complex-fixative effect directly or indirectly on the entire posterior or posteriormore cortex or does so with a complex pattern that is in fact the work of the imaginative and fresh intellect that spins out of this fabric new workings, dispositions, orderings, and dimensions of mind in perception, feeling, thinking, and action? In this connexion, perhaps the prefrontal cortices added on to the motor involve, as the frontal cortex, a seperate realm from the posterior cortices, where hitherto in evolution motor or efferent modulations of perception and its conception were simple primitive motor concerns in opposition to the high-phylogenic extensions of the motor cortex functionally independent of the arousals and intrinsic activity and thus concerns of the postmotor cortices? Assuming something like the above reticular semi-inhibition or inhibitory fixation holds (and note that acts may also be inhibited and so woven into specifically dynamic fabrics and hierarchies), the high-phylogenic consequence of this might be that in one's imaginations and in one's subsequent memory of imaginations a given scene, idea, or act may be seen from a series of different perspectives which may then concur or occur in a unified processual figure of analysis and synthesis, so that transpositions between and correlations of different and essentially different representations would be possible, that process triggering off the indefinite proliferation of images in higher animals as a qualitative difference or advantage of these animals' intellect.

### SUBJECTIVE IMPRESSIONS OF GETS ON LOOKING AT A PICTURE Pat Gunkel

In doing introspective science one immediately thinks of the success the Greeks had. But was it just random sorting and commonsensical transformation? My work on order certainly suggests the potential range and even power of so-called intuition and its uncircumscribability.

The impression one gets is that asymmetric figures (a kangaroo in hop with a thrusting tail, as opposed to a circle; or rather, a circle has its own asymmetry, perhaps by nonstraightness of circular path (dynamic qualities seem to be involved and, indeed, have been demonstrated psychologically), by frequential transformation, or by dislocatory difformity of histograms) get instantly computed into a 'symmetric' frequential component along with the more obvious frequencies of clusters, diameters, and sizes and the 'interlocking' of the textural spectra. In fact one gets the impression that this may be what the perception is all about, this asymmetry of the figure and its wave reduction so that all figures are arboreally (smoothly) comparable. always has the impression that the crosstemporal isotopy is very important, as if the external world were for that brief moment a guiding memory for the other transformations (of course the brain may snap afterimages like this and I have suggested the phylogenic role of redesigned koniocortices therefor). More directly, might a figure be transformed onto a linear or mass waveform representing its planar structure in such fashion that a detailous variety would exist between figures-one feels so. I have suggested that the structure of turning or interconnexion might do this. Perhaps by that I meant something like the following, which is tentative. Imagine that a tissue might well involve circuitry peculiarly or only naturally involving loops or topologic holes (or perhaps orthogonal squares, tetrahedra, or random-continual shapes proceeding therefrom) (the holes might become the structure of space) or unicentric or polycentric concentricities (eg pancentric with the rings being few or partial) and that then the tissue did figural analysis by taking all these loops (poi the holes!), equalizing the lengths, and serially processing them for the structure of turning (somehow defined) (or could the topologic three-dimensional chaining of/the circuitry be used as the basis of perception??); this structure might then be /random-continually isospectralized as between all the so-called loops and rand/m-continual multivariate (see the 68 schemes of mnemic classification) averaging might then occur and result in both the structural ranking and size, position-, orientation-, deformation- (partly because of the process being topologic;), intensity-, clarity- (because of averaging over preexistent/circuits), variety- (as above), population- (because heterotopic and perhaps supernumerous), color- (because structural), setting-(see above), time- (because so intercircuitally exact), motion- (ditto, metalocative, &c), &c-invariance: "turning". The fundamental difference between this and what I have formerly called random-continual representative configuration would evidently be the equalization (it is still not clear how much I would want to reduce the bipolarity ("asymmetry") and multipolarity (multikurtosis) in favor of unipolarity ("densiformity") or to what degree these tradeoff in a multifunctional tissue) but such configurations are also equalizable and I must now compare the contrasting schemes in this alternative way. It is at once obvious that somesthesia may be directly analogous to vision and employ turning. and likewise muscular cortex. Of what value may it be to audiognosia, other cortices, and the subcortices? What phylogenic microcircuitry might facilitate it directly or indirectly such as by disengagement of other mechanisms, local (vs circuital and expansive-circuital) habituation, temporal alternation (eg electroencephalographic or evoked potential), &c or what macroparcuitry? May there be anything more of comparable stature to turning, following in analogy, such as some handling of and value of time? ( Exercise & small)

#### COMPETITIVE HOLOGNOSIA Pat Gunkel

I suggested that predictive evolution may be an important ideomorphotic and perceptual principle. This immediately incites questions about the motor, goal, site, and mechanism of prediction and evolution. Indeed, I arrived at the concept in a nontrivial fashion. Finally, what is the elegant interrelation of this with my other concepts, both antagonistically and cooperatively?

The reason for the prefix, holo-, is to be found in the importance of the full correlation of an experience, present or recorded, with the brain; this is arrived at naturally by a totality of processing. One reason for this is that at an area like 19 diverse processings and loci may be imagined converging and forcing integrocorrelation for the resolution of the resultant and remanant dissonances, and indeed the persistence of the object in lower excitations would encourage this attempt at integration. Dissonance would remain until the confluent asymmetries (since peculiarly, crudely resolved and rigidified at lower areas, perhaps for the intensified provocation of the higher areas by the invariant strength of the lower) were transformationally invariant and hence simpler in area 19 (indeed, the dissonance may itself reflect the modal ingrainment and progressive simplification of the terms of the higher invariance in progressive exact conflict with further experience), and the removal of the dissonance would of course be habituative submersal. The brain is of course unipolar in the rather odd way that the only real source of order in the brain is a limited sets of objects in experience and hence this influx establishes its own emphases. Obiter, one can imagine it as a characteristic of higher association areas that there the information is so integrated, dispersed, and interconvertible (withal abundant, specific, complex, and functional) that it is at once slowed, speeded, interested in the silence about it, transcendental (eg a formerly one-way sequence may occur in it ("interest it") backward, colligations of objects and relations may occur, there may be an associative agriculture of slow organic synthesis or slow random (unidirectional and multidirectional) change ("sea change"), landscapes may form, libraries may flow into each other, meteorology may form by the exudation of vapors, cycles, and electricity over the landscapes). anisotemporal (eg avalanches, explosions, phase transitions, random periodicities, hystereses, random developments, random large complexes, "pivotal" transformations of the whole, cumulative curiosities, &c may be very typical), &c.

Competitive holognosia would occur for best resolution by predictions of all features of an object. One may speculate variously. Is there a certain 'distance' between objects or (holiform) criteria so that in the absence of a unique identification of an object these criteria will compete (perhaps because the nonuniquity reflexively causes the criteria to be ambiguous with all other criteria and creates dissonance, or may the problem merely be one of the resolution of all the criteria by which a new object differs from one past or those past (if some criterion offered the possibility of some match with the object, this might contribute a dissonance)). It is rather interesting to see here how conceptual differentiation might occur: obviously the constellations of order-having and eidetic criteria (and all their, eg lingering, correlations) in this tissue would be just enormous and there would at once and continually a massive confluence of perspectives on the same object, a tying together of complexes in a speculative order, a multiplicative-associative process, a 'finding of ideas' process, and a pairing of all kinds of ideas in a heterodoxly tremendous process of seeing; moreover, clearly there might be a certain tendency for successive images or objects to form complexes of peculiar kind and released only later.

#### PERCEPTUAL MINIMA Pat Gunkel

Perception goes on all the time, in all forms and degrees, but we pay little attention to anything but the derivatives. Therefore it is an open question what the source of perceptions is, and, here, we address ourselves to what few things, not derivates but not full descriptions either, allow ordinary perception by their salience or selection. As time passes in the course of an actiof perception, of course, series of featural complexes may interrelate in an act more involved but perhaps having its own elegance. Furthermore, our topic may be independent of a much larger encompassment of detail in the mentally visible and mnemic full description of a scene or an object.

Why lass color who is with if An excellent example of a reasonable simplifier would be color. The rates 1 Does accentuation of chromesthesia (at least by anatomophysiologic The engly open part-machinery, the use is unknown) in primates toward man, &c suggests asisent, which was the possibility of special importance, and the work of Ekaterina " Des unilation G. Shkol'nik-Yarros suggests that the structure of the visual analyzers report force . such as the area striata is drastically modified for the sake of color; spiral estation? how drastically or how purely, and perfectly why, we do not know. The since in champ fovea is the essential chromatic receptor. I have previously suggested spins, To that the ambiguities typical of shade are enormously greater than the They said of can? contemplable specificities of experiential color in the makeup and definition of objects, sensu stricto, so the informational content of typical "colors" may be incomparably greater in the complexing of environmental objects and demands. It is of course at once important to define familiar color, partly to shed the rather cheap idea we have of it, but we must be even more careful that in this definition we do not lose account of inherent structure of the types of order and their naturally subtle construction, since after sufficient analysis these may, basically unconsciously, convey the determinative elements of experience or the minima. The signatures of colors, alas, have never been either analyzed or inventoried in either the first or the profound sense, but the follow hold. Punctal color may convey in a frequency spectrum the peculiar spectra of the elements, of the molocues, and of the supramolecular structure -- in their quantity and variety -- composing the substance of an object; the basic spectra are randomly distributed and reliable; moreover, any object varies over its points. The substances of the typical world are frequently familiar and typical. The source of light for reflections is rather white and to the degree it is not may also inform, and the other conditions or lack of variations do not conflict with the specificity of colored reflections. Another uncertainty and source of information may be the granular texture of objects or fine, complex chromatic juxtaposition; which may give useful bunching and grouping. Other types of chromatic order that may be important are ia covariation, randomness, isocontent, isotacty, isotopy, isanomaly, precision, isosequency, integrity, monotony, isopycnicity, nomy/isonomy, polymery, homomery, concinnity, variation, contexture, complementy, degrees of freedom, antagonism, density, isometry, gonohomy, continuity, concern, configuration, recurrence, identity, and all the 29 7,00,000 other types of primary and n-ary order, such as the combinations of these Literations, I have listed. There of course the hue-value-chroma Munsell chips and 1442 + 1/1215 the like. Again, the exact degree of color specificity and variety, or \* (n. w. color-object covariation and narrowness, is an esoteric matter.

The fact it is so difficult to see and remember later the contents in a scene turned upside down suggests that both recognition and memory occur by a seeing of wholes and a comparison of whole scenes may go too, and need forms for recall (ie in memory for intensive comparison. Turn words upside down-it's the same thing! This suggests

that such parts are analyzed seperately but 1 and overall things involve matching-but deta preorganization).

Accomodation, convergence, and the complex-convergence of Bela Julesz are systems for immediate and simple stereopsis; one can add whatever value a local-comparison would have monocularly (eg via microparallax; distal consistency eg in interruptions, natural puncta (color, sensu lato), distal phenomena (eg haze, general diffusion, subtle changes of shading or large changes, differences due to orientation of plana) - which might, just as immediately, be integrated over large areas (eg in area 18 and eg by the like of a 50% chance of the first ratio being correct)). In any event, the area of a sensum could rather automatically be given by dispersive correspondences, by addition, by spectral consistency in wave patterns for homogeneities, by interspectral sets, &c&c, to the degree that this area is relatively, sequentially, or even important to figure or anyway recognition. Above all, there are of course all the random continua by, within, and between all the types of order, such as #61:species of objects and #63:shapes: Another rather interesting point is this -- the internal homogeneities and heterogeneities within species of homogeneity making each self-consistent (including the texture and "color") are doubtless and by average-and-comparison so differentiative and heterogeneous with the exteriors of the homogeneity, and the very exteriors are so varied, characteristic, regular, and random in their contingency or at least compresence with the "interior homogeneities", that quickly homogeneities would be seperated generally and identified specifically (and in fact there might be (various) contextual random continua). It is time for the introduction of a new concept, the "flat tree", meaning a tree with a lot of dimension which would give a chrestomathy of its products to a recognitive surface that might be anarboreal. Obiter, another concept might be that of a "dense tree" (pachydendrum?)

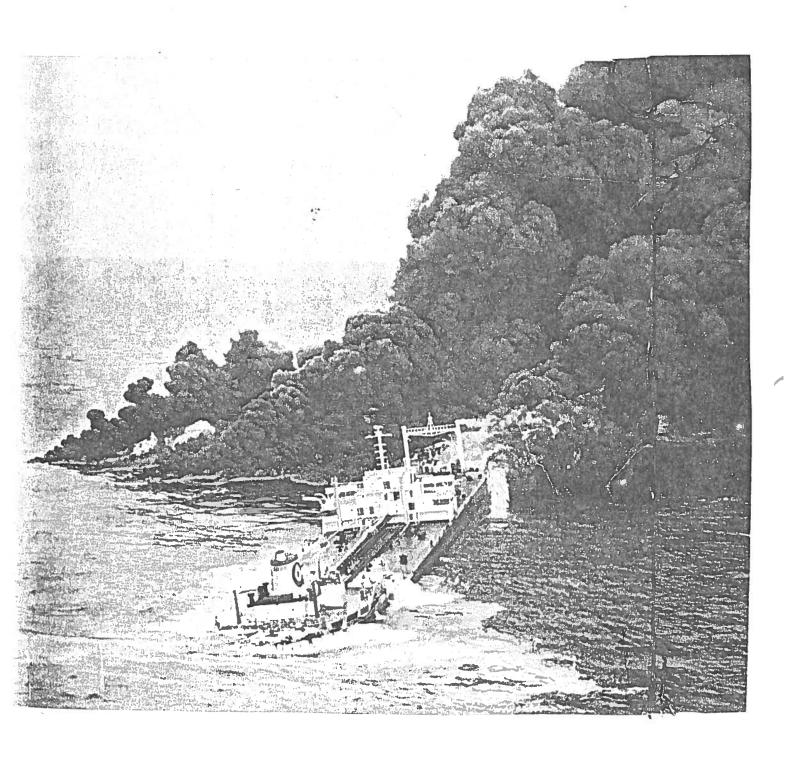
Then returning to the beginning for the application of these ideas in the sense of perceptual minima, except to say that the intent of these two trees is that there would be a very strong emphasis on the pruning, eugenics, and landscaping of the trees, on the ultimate elegance of the criteria used in any and/or minimal perception (see the 68 possible schemes of mnemic classification), and on artificial evolution. The basis, origin, role, elaboracy, structure, interconnexion and importance of such trees is not clear. but they are of immediate interest to any discussion of perceptual minima.

The point I was going to make about the homogeneities above is that, being as I suggested them, quick self-enclosure or easy (eg frequential) differentiation from other homogeneities present and past could mean they surrender, as may come about in general, extreme textural specifities which, while not per se requiring great detail and typal detail, could suffice as arboreally and matrically combinatory and exact (or at least as "cues" for ecphoric material usable in simplified analysis or analysis enlarged but expedited). One suggestion of how easy it would be for the brain to have and use such elegant criteria is suggested by the fact that in effect a matrix could be used to create a matrix, ie, since indeed a few combinations can be highly specific and general, a matrix of matrices could involve coexistence and competition between these matrices (with all possibilities having matric variety in experience) and a postliminary selection or continuous generation of a superior matrix.

A typical scene (especially when it or the object to be identified represents a great variety of choices) involves a sufficient diversity of elements and probably such an essential heterogeneity of elements that, even within a focus of attention, there will be a partly random distribution and at least one element with the sort of giveaway intrinsic specificity suggested above and of course similarly all the elements may intersectively combine in synergic specificity, withal using the above primitive or intrinsic phenomenal specificity. Bis, some indications may seem subtle, eg the very smoothness of metal. The parallel processing going on of all the points, co-points, and aspects of a scene could lead to the elevation of first and most specific (and most important by combination "indications" by the simple mechanism of insight-value in "retrospection" and its propagation, as well as by any propagability of "local perfection", and both

Such prediction might be seen another way or at least operate like the following crude description. Suppose the object is a hand. The initial events in time might go like this. Two collinear lines (the sides of a finger) might be picked up plus an articular crease (the palmar bag of a digital segment); this correlate with or "predict" a range of possibilities (pillow, leg, branch...) (note the obvious importance of order #59:precision!) or this range then imply or "predict" corollaries (which may be enormously more detailous and specificatory, eg a set of other fingers all with creases, crosshatching, extremely specific color, regular orientations of the hatching, cylindric, highly specific in curvature, &c and especially in direct contrast with other cross-excludable forms) whose single presence, by matric combination (matrices being diffusely distributed), would suffice to confirm or perhaps progressively "contradifferentiate" the percept. (Note that drawings of fingers that are typically shown in psychology papers are deceptive because the simplification is proportionate with the familiar ranking of objects and all sorts of odd coincidences and configurations are precluded.) -

1 Go on to show that many objects may be recognized by very elements (when the latter combine).



FREQUENTIAL ANALYSES ABOVE AREA 17 of period enel as may Pat Gunkel

10 a perange ( Color 1000 (50/50 - 360°). It may be that area 18 or the like is specifically concerned with the disposition of homogeneities at area 17 or, for other areas, a lower level. Obiter, the frequential pattern at a point might be identical regardless of rotation (eg concentric) or dislocation of a figure. The nature of figures is that they involve planar structure. When one looks at the planar structure of the external world one is immediately impressed that it represents a perpetual or huge turning of lines. I have shown that it is very easy to show that rotatory, continua should appear in cells, measuring and averaging angles, eg especially right angles, on the basis of waveforms. But where do lines turn but at the endings of homogeneities and where do they turn but by the random directions of turning of the homogeneities of the external world. /The homogeneities are the degree of homogeneity from the "textural universe" of an object, that is, here, all the frequential dull and detailous identities by combination of different neural points; in the presence of homogeneity one has the harmless equivalent of noise or summary inhibition, as the case may be; the textural universe of an object is all the active possibilities of combination in a tissue result from the congruence and real stimulation of all the points of the object registering in the brain, and the continuity presented in that case in that tissue, or in any tissue as that plurality which is summarized as the "resonance". Through averaging and/or orthogonal bias (as discussed) elsewhere) all turnings may be analyzed in terms of unipolar deviations (any turning seen) or bipolar deviations (as between 0 and 900, likewise Cfor 1800-directionality, in its case) and eg in this fashion scored; in any event, the question the tissue may put to itself is collection of turnings of the homogeneities and the tendency of this to close at any point (eg of size) as well as to unite at all sizes. In fact, the circumscription for cells of the homogeneities at the level of area 18 may automatically give rise to closure as the differential intrusion of the borders of homogeneities (if there is lower inhibition, virtual central inhibition and peripheral extrapolated, direct, or the like closure may occur over the line and summate, tur according to the probability of closure resulting from the understandable the Winn habit of closure and the exclusion of counterarguments to closure at least within some criterion of simplicity; one reason might of course be proximity The become and proximal continuity, as well as the angular congruence and continuous togette a correction or interlinkage about the figure leading to local unity over the Figural . spread of area 18 or 19, or the simplicity of the sets of these factors in independen "virtual" points of area 18). In any case, in areas 18 or 19 there eg may be disturban an arboreal intraclassification of shapes or figures by a frequential process dipodega indifferent to size but fascinated with the structure of the wayeform (rather on the interestingly, the structure can be and can easily be acentral and distributed seg ) or "densiform"-the density would of course be extremely intricate and/or Como th specific, so the term is deceptive, and the information represented could be intensive and coreferent ("idiovalent"?) so that what would be signifigant really would be the structuring of turning (at any size of homogeneity) as a spectrum of importance otherwise indifferent to frequency /; consequently in Wareas 18 and 19 most-probable overall shapes would emerge as progressive differentiation of forms (by specificity of turning which is simply the structure of homogeneities) at each point of size and structure; of course, because not all turns, so-called, are equal, equally evident, equally unambiguous, equally noncompetitive, equally marked, &c the choice and progressive emergence of forms must not be expected to be itself homogeneous. The consequence of the densiformity, directionlessness, &c of turnings is that the presence of these

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1 Hypercomplex-II corner cells may appear in extrastriate cortices because once a displacement has occurred in one direction, the greatest novelty and

information would consist in a nonparallel sweep (ideally 90°) so naturally the cells would tend to identify with toward-900 union of 2 lines (the old and new) ie corners. The preexistence of lines in area 17 means that the motions initiated, modulated, or eg-kinesthetically in 18-19 would create remembrant corners. By area 37 there could be a correlation of collicular leaps or 'ranges' and occipital details (might area 37 integrate pro- and reversal information to give the form, construction, serial, transcrial, &c possibilities inherent in an occipital primitive visual form language, or in fact nothing but the serial assemblage and recognition of aspatial strings of complex occipital forms, or, in being passive (?) (vs occipital as active), sense of 'mere' memory of movements, morphic series, interkinetic reposed wholes, &c?). By area 39 occipital detail and form could be imported into primitive and then complex possibilities for vocal synesthesia (first eg simple intensities, reversals, fittings of subjective 'size' of movements and figures, complexities of movements, velocities, &c). By audiovocal synesthesia in eg areas 22-39, subjective concomitants of causes of vocalizations could be common between to allow mutual comprehension and the basis for differentiation of symbolic communication ('understandings'). Combined with the contingencies of visual and general somesthetic input to area 39, primitive-then-complex interpersonal transmission and coordination of larger spheres of hierarchies of symbols could occur: the symbol here would be uniquely the points of contact between beings and hence would have a discrete tendency of substitution, eg since the symbol might refer to irreducible but 'now'-combinable and intercombinable occasions. It's quite reasonable that only toward, esp or only in man did kinesthesias become bidirectional and reflected back to modulate perception, whereas heretofor the flow was unidirectionally sense -> motor cum motor (somatesthetic); this immediacy\_ and regularity of motor->sense modulation could lead to the sensory symbolization

Another, related method:

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congruences would occur along the contour

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(Could this give rise, by tangential loci, to topologic structure recognition or morphoclassification?)

Summation of approximative congruences of targets.

The question of the handling of intersections by turning integrals (simple extrapolation but case of antagonists equals?).

2 eg acquisition of full connexions differentially delayed;

3 Eg the densiformity may be distributed between all types of curves, it may give the number of curves, and quasi-'aspatial' shapes of the curves.

different frequencies, figure comparison waveform waveform lengths, and to mean closure for colengths of circle; the angular angular forms functional analysis perfect circle may be preaveraged  $(50/50 \text{ minus } 360^{\circ})$ waveform analyzed into angles-at-- ← analyzable into 'major sequence-points density correlations. Pour of it & frem treef of same and Aspatial hierarchy of angles distributed by eg number for kind and evening for \*limb\* 'confusion'. If intensive (for angles at every point summed and sorted), a Fourier analysis could be done rather emphasizing large figures as 'densities' for subcorrelation. 2 Equation: (((turning within turning) within turning) ranked). 3 Turnings are transceleratory? ah, ha! so the patterns of turning that come in over time are eg-densiformly universal: the "turnings" are in fact the pattern of celerations, which is autospectrally averaging as a form-invariance common to the irradiated (or simply reached, however so!) cells. 4 It has to involve change? Intrinsic dynamictextures will correspond and inhibit, as changeless and static, the familiar? 5 Might "simple cells" correspond to frequencies of 'rotation'? A "complex cell" could then be the escape, denying rotation by areal sensitivity and requisite parallel movement (itself frequential): rotatory cells could then equal dimension zero (point), "complex" cells dimension one (as progression); (the hypercomplex two, and other hypercomplex three??): where these aspects would then be used in construction of figures (eg dimension 1...) (you know--lines together give points intersectively). The simplest material for certain cells would be the turnings and for others, subsequently, successions due to closings of turnings, where successions would all then be compared together as a figural universe independent of size, distortion (independence of angles, focus on changes and sets), dislocation (same thing), and rotation. There also might be the fact that internal relations of the figure would remain invariant or at least distinguishably contravariant to extrafigural relations: this could certainly involve a "relative peace".

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cells or concerns may be inobvious and nonrepresentational, ie eg the microscopy or macroscopic count of the tissue may be of the density and structure (eg essential closure, essential transformation of form, perhaps gestalts) of turnings ~ characteristic of a scene (and these may be eg only pulsatorily represented in probes). The reason for the turning might actually be the 360° ambilocation of discontinuous homogeneities across time (and after all., scenes are in constant oculokinetic motion) and the planarity of figures so that in order to define and pair homogeneities variability of turning must be transcended or registered. To rank a picture one would therefore look at it and say, "What is the densiform structure of turnings?", which supplies a continuum for the progressive but uniform differentiation of all shapes. By 37

Bis, one might look for a similar role for eyemovements; there are after all hundreds of millions of them in the first years of life. If the eye jumps from point to point after having "snapped" the scene from each point, the cells in area 18 &c would be in the position of learning redundancy again but at the same time there would be laid down a language of transformations of forms or of anticipatory structure; it may similarly be wondered whether the cerebellum is concerned with a switching of bodily, neural, and possibly cerebral states for the sake of forcing 'maximal distances' of correlation and operational evolution of parts of the brain, &c? Obiter, were certain cortices developed so that at first they were purely passive and recipient and only later became inhibited (or at first purely excitory or the like), such as the prefrontal area, would this have some special result, such as a concern with large units of time, space, experience, or the like?

We may consider that area 19°s cells are concerned with turnings so that they receive a total mass of turnings and the total mass of forms, divided by homogeneities, and are able to recognize in this way a shape or detail with little regard for size or compatible with their other information. Again, turnings is a deceptive term because what one has is a structural continuum that is form-invariant or at least progressably form-explicit.

It is possible one function of the fovea is to make peripheral sensa more form-signifigant by enlarging on their details, as in the peripheral perception of very large forms and of background details. Also, the intense fovea may use the periphery for the interrelation of details with large, complex, and locable visual structure; that passed through the fovea may be remembered so that the periphery serves as a kind of memory and reference for the foveal memory; even over a long period of time (eg quasi permanently) the foveal memory may give the periphery its complexity and apparent detail, and furthermore the fovea may actually give the periphery a system of classification and memory, if perhaps just by reference to the fovea's.

It may be imagined that the consistency of cell function over homogeneities causes at least some cells to "refer inward", ie the oculokineses would not only be tagged directionally and orientively but also in terms of pointing to the \*average\* (whatever) of the various homogeneities in the signification of inside and outside and the specific production of closure, say by combination with the border-continuous and other cells or cell functions.

A summary example. Suppose one just traced the outline of a figure and converted this into a serial code representing the turns in the outline and their continuity; in fact one would automatically expect such cells as those of area 18 to do something like this by the unition of continuous and collinear cells in the niduli of 18-which would also give an aspatial or "densiform" or 7 spectrum of the convexities, concavities, continuities, degrees of turn (and note the degrees of turn always average out the same between figures, so that white. a homogeneity may be circumscribed and closed by any border). Then one would have metasize through an equalization of length and comparison of figure in turns, or through some emphasis on certain corners, or even by the alinear method suggested just above. This would be "turning" in practise.

# IS DAVID N. HUBEL CAPABLE OF INCAUTION? Pat Gunkel

I address you, David Hubel, deictically.

Do you paralyze the recovery movements of your animals' eyes? Then the preference for moving objects shown in "complex cells" &c could represent static fatigue. In general, it must occur to you that a paralyzed anesthetized animal is a very atypical observer and it may well be that all the data you have gleaned is peculiar and artifactual, quite misleading with respect to the occipital (or lower-visual) activity of a free-moving spontaneous observer? It is well known how disinterested the cortex is in diffuse illumination—no wonder, since fatigue is associated with cortic events. The escape from this fatigue is a moving line or what you have called a "complex cell". It is said that there is a slight purposive fuzzing of geniculocortic fibers for stereopsis—would not the statistical distribution create anisotropies and effect "simple cells"?—no matter, a little imagination can cook up a multitude of reasonable hypotheses derogating such cells and probable in the net.

\* "Complexety " (or motor preferent lity in anymony.

### THE SECUND ORDER ORDER OF THE ORDER PRECISION Pat Gunkel

In the course of extending my investigation of the incredibly complex variety of primary, secondary, and higher order orders, their inflections, subcategories, complexes, examples, intracognitive and mundane texture, and in the course of thoughts elsewhere, it occurred to me that the type precision is at once obviously extraordinarily interesting as an epistemologic concept in itself; my theorizations and observations had already suggested to me a number of concepts of noologic mechanisms possibly relying directly or indirectly on some form of precision to some degree - even centrally. (These and other concepts, and sorts of order, by the way intimate that other interpretations of Gestalt phenomena are possible and plausible, and the full set of interpretations may be very large and simultaneously active in affording us whatever degree of insight we have into things.) Two things that may be pointed out in advance in this discussion are that any type of order may be "singular, plural, and ambiguous", and that any single type of order may stand in adjectivizing or adjectivized relation to any type of order in two sets. One thing that might first be done is to orismologically compare the various types of order for the ordinal and cardinal ranking from the base, precision.

One reason for interest in precision, incidentally, is that—because of such concepts as higher-order curvature, euparallelism, various kinds of trees, ascending elegance, anamorphosis, ultimation, attributive reassociation, redintegrative abstraction, integrocorrelation, &c—transformations and integrations necessary for simplicity and variability of precision may be easy, obvious, and probable. It may again be noted that the operations necessary for

precision to work need not be euparallelistic - ia.

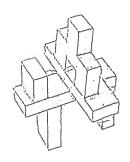
There may be something especially satisfactory or complete about tertiary order. If one takes a primary order like precision and looks for its modification of all the other orders, one may look for examples of this modification of any one of the latter by looking for instances of any of the types of order in it; in other words, in this reflex case one is dealing with the 350,000 or so types of third order order in a rather natural and autosymmetric way, and one can just by glancing learn something about the ummanageable variety. When one ascends to the higher order order the phenomenon is encountered that the subtleties in and between the types and within the world suddenly become critical and one might as well count atoms; there is beauty but it defies analysis. (Automaia)

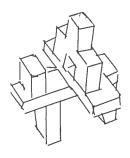
### HOW THE BRAIN HANDLES GEOMETRIC SCENES Pat Gunkel

When problems of this kind are presented by analysts or even when tackled by engineers the representations are a little out of the ordinary and often most different from the natural material of experience. Bis, the situation is itself biased, both subjects and machines, and negative and positive criteria; to conclude how badly this is true, to quantitate the story, you would have to go back and examine what you have seen and what others have seen, but the lack of control for, awareness of, and measurement of these things is suggestive. Let us say a single closed line figure is presented and it suggested man can or cannot, would or would not recognize this; that might be very dependent on the understanding of the situation or even the customary environment; experimenters are highly ignorant of these things. But were 'all' the factors concerting in a recognition stated by an experimenter it would then be necessary to go on and correctly weight and interrelate each of these and this has never been done nor really approached.

Here is someone's scene:







Note isangular and whole isoplanes are isohetero-shaded, the continuum (other edges, eg upward, sideward, 'and' forward) is systematic (simple and neat), that the perspectival gradient is simple (tridimensional: hexadirectional) and extrapolable and interpolable, the same shapes are paralaterally gradient--regular, the entire solids-configuration may be computed (and this equation, used often, is redundant and so 'essence-reducible' (a la "celerations")), &c. Of course, often the photographs are ill-reproduced in texts and one does not know for sure what was intended or accomplished. As to the idea that this scene is atypical, say in its complexity and regularity, it may be noted that natural scenes are typically multi-level, multi-object, complex, 'skeletonically regular, clusterally simple, concorporate, hierarchic and 'ultrahierarchic' (ie involving subhierarchy, hierarchic composition, holistic hierarchy, good organization of the possibilities, superordinate hierarchy-class, &c) eg relative multiplanarity (relative smoothness, definition, tonal gradience of surface) or relative angularity cum multiangularity, relative or absolute figure-ground seperation, and the like; that American everyday scenes are artificially geometric.

I would make little distinction between essentially bidimensional and tridimensional representations and see the sensory concept of solidity as trivial. What interests me is the means for finding invariance over rotations, distortions, populations, settings, and obscurations. When I suggested the brain has an easy time using (versus other cues or chaotic detail) celerations to cope with such problems, I meant it is quite interested in recognizing curves in place of what it considers excessive zaggedness, detail, complexity, irregularity, complication; large patterns or features, perhaps, in place of small; certain features or elements; and that it uses these things indicatively. But "curves" are complicated things and must be defined, eg what appears a

curve may not directly or indirectly paired with collaterals and collateral transformations, and curves may be logarithmic, additive, or have various other large sets of functions and withal be regular, simple, and also freely organized in a tissue (the brain may acquire, sort, and use an indefinite number of curves, say in the matric production of their order, in the derivation of the obvious and practical ranking of the amassed detail of experience). Furthermore the important point is just whether the brain could average and scale curves because figure could then follow from the analysis of the mass of experience. Obiter, the mass of experience which constitutes a lifetime deserves analysis and depiction, in part for what it hides and in part for what it has as obvious.

How are "curves" or 'figures of transformation' recognized? In any tissue one can imagine cells and synapses that only naturally count (eg particular or any consistency, details of a line or corners, &c). On the other hand, counters may be stacked or netted so that 'orders of magnitude', relative counting, rate of counting, and infinite counting may occur algebraically (including extrapolable counting), and/or the entire mass of tissue may count over a just or arbitrarily huge range. This counting or estimation can be analogue or digital. Likewise simultaneous, contra-serial, modulated, complex, abstractly independent, massively complex, subtle, &c estimation or counting can occur, such as the measurement of relative flow. Beyond cells and synapses, nets of cells may work; especially favorable is the fact that these nets are thickly extended and intermapped in space, in terms of the orientation and composition of irradiations, and the mere fact that all these are so very innumerable, as well as that function interpenetrates and may evolve to infinitive density, ie eg functions may become part of one another.or third functions unite and replace two. Apart from counting one may look for memory and its various representations, eg palimpsestic resonance equiperiodic for digestion of figural wholes and perhaps fading thereafter (and again, functions may interpenetrate and be extraordinarily complex so that huge mnemic ranges may work on equal ranges of figural transformations skewed "simplohierarchically"). It is already obvious that range of periods may be captured, so the only signifigant thing is that rates of change and changes of changes (of any type) form an applicable and indefinite continuum; it is to these last that I allude in speaking of "curves", so the term is slightly misleading (but less so because continuous). In a certain sense the recognition and universalization of a curve is no more difficult than cellular association for other recognition, in part because what is taken might be nothing but a cross section of the tissual functional pattern or its return in a rate or pattern of change, in part because curves or complex patterns of change are typical in even spatial experience (eg explicit on the edge of designs or implicit in such things as the patterns by which trees branch in pictures, and certainly better examples or just better statements are possible), and in part for more reasons, such as the pattern of movements seen by the eye or constituting the world.

Consider for the moment isopycnicity. By its agency isoheteropycnic gradients and contractinal gradients or relative edges or points of reversal may be picked up, hierarchized indefinitely, and averaged across experience to seperate objects in a scene &c, and these things may extrapolate anyway; moreover there may be operating in perception &c (but always parallelistically masked) successive and coexistent levels of definition of individuality and levels and kinds of representation, giving multifunctionality and multi-individuality in what for all the world seems simple individuality (or this precision may deliver the impression by the subtle parallelistic choice of some aspect over all others). The isopycnic gradients, their transformations, and their details may be regular, sortable, and rankable by any nervous tissue; likewise for gradients in any of the types of order.

# SUBJECTIVE IMPRESSIONS ONE CETS ON LOOKING AT A PICTURE Pat Gunkel

In doing introspective science one immediately thinks of the success the Greeks had. But was it just random sorting and commonsensical transformation? My work on order certainly suggests the potential range and even power of so-called intuition and its uncircumscribability.

The impression one gets is that asymmetric figures (a kangaroo in hop with a thrusting tail, as opposed to a circle; or rather, a circle has its own asymmetry, perhaps by nonstraightness of circular path (dynamic qualities seem to be involved and, indeed, have been demonstrated psychologically), by frequential transformation, or by dislocatory difformity of histograms) get instantly computed into a 'symmetric' frequential component along with the more obvious frequencies of clusters, diameters, and sizes and the 'interlocking' of the textural spectra. In fact one gets the impression that this may be what the perception is all about, this asymmetry of the figure and its wave reduction so that all figures are arboreally (smoothly) comparable. always has the impression that the crosstemporal isotopy is very important, as if the external world were for that brief moment a guiding memory for the other transformations (of course the brain may snap afterimages like this and I have suggested the phylogenic role of redesigned koniocortices therefor). More directly, might a figure be transformed onto a linear or mass waveform representing its planar structure in such fashion that a detailous variety would exist between figures-one feels so. I have suggested that the structure of turning or interconnexion might do this. Perhaps by that I meant something like the following, which is tentative. Imagine that a tissue might well involve circuitry peculiarly or only naturally involving loops or topologic holes (or perhaps orthogonal squares, tetrahedra, or random-continual shapes proceeding therefrom) (the holes might become the structure of space), or unicentric or polycentric concentricities (eg pancentric with the rings being few or partial) and that then the tissue did figural analysis by taking all these loops (poi the holes!), equalizing the lengths, and serially processing them for the structure of turning (somehow defined) (or could the topologic three-dimensional chaining of/the circuitry be used as the basis of perception??); this structure might then be random-continually isospectralized as between all the so-called loops and random-continual multivariate (see the 68 schemes of mnemic classification) averaging might then occur and result in both the structural ranking and size, position-, orientation-, deformation- (partly because of the process being topologic;), intensity-, clarity- (because of averaging over preexistent circuits), variety- (as above), population- (because heterotopic and perhaps supernumerous), color- (because structural), setting-(see above), time- (because so intercircuitally exact), motion- (ditto, metalocative, &c), &c-invariance: "turning". The fundamental difference between this and what I have formerly called random-continual representative configurations would evidently be the equalization (it is still not clear how much I would want to reduce the bipolarity ("asymmetry") and multipolarity (multikurtosis) in favor of unipolarity ("densiformity") or to what degree these tradeoff in a multifunctional tissue) but such configurations are also equalizable and I must now compare the contrasting schemes in this alternative way. It is at once obvious that somesthesia may be directly analogous to vision and employ turning, and likewise muscular cortex. Of what value may it be to audiognosia, other cortices, and the subcortices? What phylogenic microcircuitry might facilitate it directly or indirectly such as by disengagement of other mechanisms, local (vs circuital and expansive-circuital) habituation, temporal alternation (eg electroencephalographic or evoked potential), &c or what macrocircuitry? May there be anything more of comparable stature to turning, following in analogy, such as some handling of and value of time?

The surrounding universe is observatent ! coordinate linearity? collinearity monotony isopychicity

### THE NERVOUS REPRESENTATION OF A PERCEIVED LINE Pat Gunkel

There is a stimulation. The length of the line triggers elements that normally belong to the set indicating inclusive extension over an area when objects are areas, esp since the absence of the other usual concomitants of an area representing the second dimension of areas and the entire absence of simply correlable paralinear concomitants on the present occasion both facilitate the synecdochic symbolism of the line as if the adequate identification of area; the absence of these concomitants, however, causes a simplest identification of congruity over the anomaly and presses into action analytic processes, so that the line, as less than the area, at once elicits two sets, one accentuated and satisfied with the simplicity of the line in its analogy to area, the other accentuated as dissatisfied. The cells at any point have already acquired familiarity with the spatial properties of the nervous region and the sensory receptor (including succession, addition, consistency, gradience, intermappedness, relations of logical quantity, &c) and consequently direct identification of points and properties occurs over the directly and indirectly stimulated nervous points, relations that are reciprocal over the various points and may be used by each neuron to predict the structure of its field, a mass activity demonstrating simplicity of the whole. The line has the peculiar property of being both consistent over its length and imparallel, so the cells receive a bitonal message indicating simple split integrity. The nervous region has averaged over itself long before and thereby acquiring the equivalent of a line since a line is the perpetual interface of areas within a neural mass, or the mass acquires the equivalent of a continuum of lines at every angle and point, so the present phenomenal line has an innate complement and in fact, drawn from the continuum, a unique complement signifying its angle and point; moreover, past sensation has been discontinuous in time for flow gradients accenting the above line consciousness, in space because of points creating acquainted loci and points irregularly distributed, and points emissively creating waves that approximate and are texturally essentially lines in general, and areas approximating and even specifying lines and continuous with lines over the continuum of their length/width ratio and accentuating lines by contrast with their exclusive areas or making lines by making a webwork by "ergic" collapse over their homogeneous area, and explicit 'pure' lines belong to experience. The usual dispersion and irregularity (eg zaggedness) of features, approximating various kinds and styles of randomness in a proper continuum, has already created in the tissue means of normal and efficient shortest-cuts so that lines actually shortcut the shortcuts and, furthermore, stand as extremal (straightest) and mediate (180° versu other degrees) poles or, averaged over all the tissue, self-abstracting legally inviolable pole (the concept of the line). Again, the relation between all regions in a tissue is everywhere an interline or interplane, and interplanes rotatorily summate as interlines (conversely, interpoints regularly extend and summate as interlines; all in all, a transformative and universal fabric exists including as an important term the line). The ideally breadthless line has another peculiar feature, innate and/or learnt; that its linear continuity contrasts with its mull width to create, in contrast to an area, a direct invasion of all its parts by inhibitory or excitory paralinear cells, an effect only appearing at a minimum narrowness; also, its breadthlessness permits the above transactions to skip the (preexcited and in any case anomalous or allovalent) line and act interlaterally. The absence of a continuum in the transverse axis causes the continuum responsive to the line and representing normal stimuli and another representing the functional blur of the tissue to undergo an anomalous inversion and thereby contribute to the nervous uniquity of a straight or at least sharp line or border; eg normal specific inhibitory-excitory equilibrium may disequilibrate as an overshoot (perhaps as a complex but typical excitory-inhibitory transverse figure - a la an inhibitory surround The continuities down the line (regardless of whether, eg in some cells or largely, excitory) could have special conductivity for any or neighboring stimuli, perhaps serving extremal detection and summary or transareal summary. The molecular and moler

structure of the tissue already prefers sensory lines because its short and long fibers are both actually and temporally linear, the tissue being a matrix of lines of all lengths and orientations (in fact, whose 'collapse of space' automatically provides an excellent sorting mechanism for lines and figures via crosscorrelation). Another source of line preference would be that parallels in experience would have such peaking: the coincidence represented by emissions crossing from one line over to another imparallel line would be extremely less than that from parallels, speaking in terms of plethoric transient relationships and even reciprocities of continued position and continued emission. To correlate information from any two or more points in space a line must necessarily be involved, thus insofar as vision does anything more than mass intrapunctal analysis, it employs lines.

Assuming that cortic neurons involve various pieces and aspects of lines, therefore, the bisynaptic convergence from these initial cells will bring into interrelation all the aspects and pieces of perceived lines and the secondary and higher cells will be in a position to pair such things for the perceptual reproduction of the figural simplicity of the experienced input, as in the extension and 'fasciculation' of bits of lines into completed and well-defined wholes. Discontinuity in such extension might bring into play typical alternatives associated with the anomaly, and a preference for verticial and pontine' interrelations with this locus; if in this way there are corner cells in this secondary tissue, the concern of the third synapse might well be with the polar continuum of simplest and alternative conjunctions of corners in the construction of figures; in other words, over two sets of synapses the assembly of mere lines into 'total' figures might occur, or by then adequately complex transformational invariants would have been created that the discrimination of the universe of all spatial visual shapes could involve just linear specification over a comprehensive bipolar continuum (bipolar in ranking any figures with respect to each other with respect to any one figure, n-polar in drawing on indefinitely divergent aspects to create a democracy of associations and wherein any figure -- depending on its essential frequency -- would be well-spaced with regard to any other likewise).

In the recognition of and cellular commitment to figures, lines might be preserved as specific values in intersective ingredients of the derivative figures, much as, in the case of lines proper, points might be preserved as the intersections of lines; in the former case, lines would be preserved as the universe of possible interrelations of possible figures, is as the material for the figural axioms.

A line has another characteristic: modulo the length and the width, their ratio would gain a special representation by the interdivision of the length into the width and the width into the length, creating both harmonic values and anomalies, but also a road of transformation, so that a special analytic axis having a value for the line, any line, and any object would be created. Obiter, it is interesting that an axis of harmonic value, extensible to any figural asymmetry, would be size-indifferent and form-specific for any figure. With regard to the by now familiar multiplication and proliferation of analytic dimensions, or the growth of an n-dimensional idiomorph, it is comforting to note that their intercombination, mutual dispersion, universality, gradience, conspicuity as a negligible fraction of the total population of possible and standard correlations, conspicuity as far-distributed and far-sequential along the hierarchy of necessary associations, and contemporaneous parallelism in tissue operation would seem to permit random-access recognition such as we see in man using oligosynaptic correlations and dispersions.

## WHY CORTIC CELLS CONCERNED WITH VISION PRIZE LINES Pat Gunkel

The reason is simple. The brain is concerned with intensest discontinuities and a bulky object like a filled circle (the perfect "antiline") would not exceed a line or edge provocatively (for the interior is redundant) and might be less provocative (for thick interior might be expected to spill over gradiently onto the exterior and blur the compresent linear contour, and in addition the intensity advantage conferred by sharp interlateral interaction over a mere line would be lost, where the ideal convergence might be minimum narrowness, or perhaps the orthogonal asymmetry of a line indefinitely long and infinitesimally wide). On the other hand, grossly inferior stimulation would be supplied by a point, collinear points, or an interrupted line (tho actually the maximum provocation might in fact be presented by a suitably interrupted line, as can easily be imagined by thinking of the complicacy of the image presented by such arrangements of reflective depressions on lakes in miniature). Possibly another reason favoring lines over solids in neuronal fidelities is the censual extreme predominance of lines in normal experience. Moreover, solids and plana are such more obvious and thus simpler stimuli that at any one moment or over the lifetime their ready habituation would minimize their provocativeness or render their activity covert (by complexity, or alacrity of response, rc). Another reason would be even simpler: in the neonate or adult such a disadvantage might be conferred by distance of tissual transmissic (by natural or inhibitory attenuation) that the opposite perimeter of a plana would be inconsequential (and its homogeneous interior would be indisturbant) and, conversely, the optimum distance for contribution would be near the breadth of a line or zero. (Moreover, the least rhythmic similarity would be provided by orthogonal axes so that, for opportunistic reasons, a mere line would be phasally exempt from greater planar inhibition answering the direct excitation.) Some consideration may be given to the fact of the predominance of linear over pansive movement in normal experience or at least the application of the above deficiencies of plana and solids as compared with lines. Also, when a solid or planum first appears its existence will be communicated at first and continual by a dispersed and nondispersed peripheral line (around a dull interior), and when compresent shapes interact they will do so irreciprocal and reciprocal linear fronts. Therefore the ontology of all figures (lines, plana, and solids) in the perceptual cortex will consist, for practical purposes, in but lines. In fine, lines are natural! For these reasons one need not consider an exclusively linear or hereditary mechanism for explaining vision.

### EXPLANATION FOR THE SERIES OF CELLS SEEN IN THE VISUAL PATH Pat Gunkel

If we first imagine a situation where there are only, in addition to a central cell, contiguous cells and thus a ring of these about the central cell; and we begin after one of these contiguous cells has been stimulated to fire and is supposed to have exerted some simple transmissive effect on the central cell, then it is easy to suggest that the ideal for the second stimulus to the central cell, within minimum time, would be another contiguous cell but the one farthest from the first stimulating cell, at 180°, to the extent that this would involve the greatest temporal seperation, with respect to phasal and nonphasal considerations in a certain, typical environment of reactive inhibition, or simply in an environment of isotropy and uniformity of law over a planar tissue. The next, third ideal contiguous cell would or could then be either of the two at 90°, with respect to the central cell, to the first two cells. We see in these elementary formulations an explanation for both 180° lines and 90° right angles at a minimal or atomic stage of development. At the next stage, we introduce a row of cells external to the contiguous cells of the central cell, therefore a minimal set of noncontiguous cells. It becomes of interest that the ideal stimular cells and multicellular stimuli would apparently preserve the elementary linear and orthogonal arrangement, and that any further increase in rows of cells (to a presumed limit and a limit posing no obvious problem) should merely extend the arrangements.

To analyze further the above, cells and stimuli falling along such a line (whatever its origin and function) intersecting a central cell or cell whose response is individually investigated, should summate their input to the central cell with an ease impeculiar to plana (as against lines), since areas may not give the clear seperation (necessarily maximal at 180° and 90°) of contrasignal (excitory and inhibitory) stimuli natural to unidimensional lines.

Now consider the case where cells have arisen with ideal stimuli that are lines of a single orientation and station. The contrasignal context of a successive layer of tissue (such as cortic area 17 after the thalamic laterogeniculate nucleus) could compel the substitution of a new ideal stimulus for the new cells (it may be asked whether an intermediate stage of cells sensitive to intersective lines regardless of orientation should not be anticipated, followed by a stage of fixed orientation?). That the stimul1 and transfer at this stage were already only lines could compel the new ideal to be fashioned at the simplest ideal stimulus at this stage could then be continuous from lines. The simplest ideal stimulus at this stage could then be continuous and/or repetitive movement of a monorientational line (to the best of my knowledge it has never been determined if semicyclic motion is equipotent with holocyclic motion), and the ideal directions of motion for different cells would be spectralized within the contrasignal matrix of that tissue of cells.

At higher levels a redivision of lines and axes could occur within the competitive contrasignal matrix (and the whole transformation from points into lines and back into points could serve the perception of extended forms) and there result, in this hypothetic way, hypercomplex-I'cells embodying extension, definition, and linearity. (In reaction to this, a series of hypercomplex-II' cells could be hypothesized to come about as simply orthogonally complementary or superimpositional to the 'hypercomplex-I'cell delimitation.) In terms of these comments, it is conceivable that the particular transformations and phenomena suggested are trivial with respect to the full information processing occurring occipitally.

\*Hsand? that thexedo Dog: A was

# THE REASON FOR THE SERIATION OF THE CORTEX Pat Gunkel

In the simplest nervous system imaginable the sensory and motor nerves would be wholly dispersed and both dispersed on the same lone region. Something like this decreases as we move to man, eg the rat's occipital lobe is intermediate. In the simplest case, concepts that would evolve would only involve simple sensorimotor correlations with the emphasis on simple reactions. The addition of regions in series would bring qualitative improvements, to some extent corresponding to each addition. If the visual projection to area 17 is precisely receptotopic, the creation of an area 18 would have a twofold effect: the dispersion of fibers from 17 to 18 would dually emphasize structure and detail, so that 'for the first time the apprehensible structures would become detailous, since an area would be 'added' (17) wherein points-outward detail is a special matter for analysis, and hierarchic eversions would occur to area 18. The further creation of an area 19 would be a qualitative addition, for the difference represented by novelty would simply be satisfied by structural criteria in 18, so that 19 would therefor be superfluous, and becomes differentiable only by structural transformations linking structures in 18 and developing hierarchically and aspectually in 19; in other words, the 'events' in 19 would be the there-localized dispersions, in effect, of 18 onto 18; whereas the points in 17 would be locale-specific and in 18 structure-specific, those in 19 would be transformation-specific. It might be suggested that the points in an area after 19, say 37 or 39, would be Hr 19= 1 New How nontransformation-specific, evolutionary, general, universal, conceptual, and/or semantic, and might be a qualitative, albeit indescribable, addition, and this series of additions continue thus. Nevertheless, man's unique intelligence might have involved the sudden evolutionary addition of a switching system with its own sphere, bringing progression: perception, conception, effection, and/or activation might be that switched. If the cells of 19 are concerned with structural transformations, these might form a closed system; might the effectual dispersions of 19 onto 19, in a 37 or 39, qualify as a qualitative addition to the series through its points having a concern with transformations between transformations themselves since the points in 19 would be, in continua, transformation-specific and thus heterogeneous, and would these cotransformations or "ekatransformations" not have something of the nature of logic ie logical transformations? If this qualification is good enough, there is good reason for thinking that yet another qualitative addition to the series, of "dvitransformations", exists and would be important. Then how long a series is necessary for human intelligence and what are the various additions and how do they work and where may they be located? In any case, one hesitates to draw the line at any time. And, one must ask, what are "logical" transformations? The process is 'reversed' at the motor end:

ogical transformations? The process is 'reversed' at the motor end:

| locale-specificity |
| structure-specificity (static transformation) |
| transformation-specificity |
| characteristic transformation-specificity |
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If complexes intersect with complexes at a secondary cortex then multidimensional selection can occur through complexes cutting off complexes, giving "multidimensional abstraction". This might be particularly interesting temporally inasmuch as special sequences could in this fashion be selected (eg particular sequences of timbres). It is particularly interesting at even higher cortices since the successive "sequences" abstracted in this way would be heterotypal, giving progressive levels of generalization. Is there some resemblance, at the very next level, between sequences of sequences and thought? We would in this way, theoretically, in the auditory case, have progressed: 41 (complexes), 42 (complexes intersecting complexes and thereby selecting sequences), 22 (sequences of sequences giving a mimicry of thought).

Of course the intersection of complexes with complexes could also or just be a way of sharpening association for the sake of generalization since, what could not happen in a primary area, clusters of particulars could compete and overcome (even completely—a true process of abstraction) one another: "cookie cutting". Any such fine-tuning could of course increase the discrimination between percepts, increase the discrimination of analytic dimensions, and enlarge the number of percepts simultaneously and

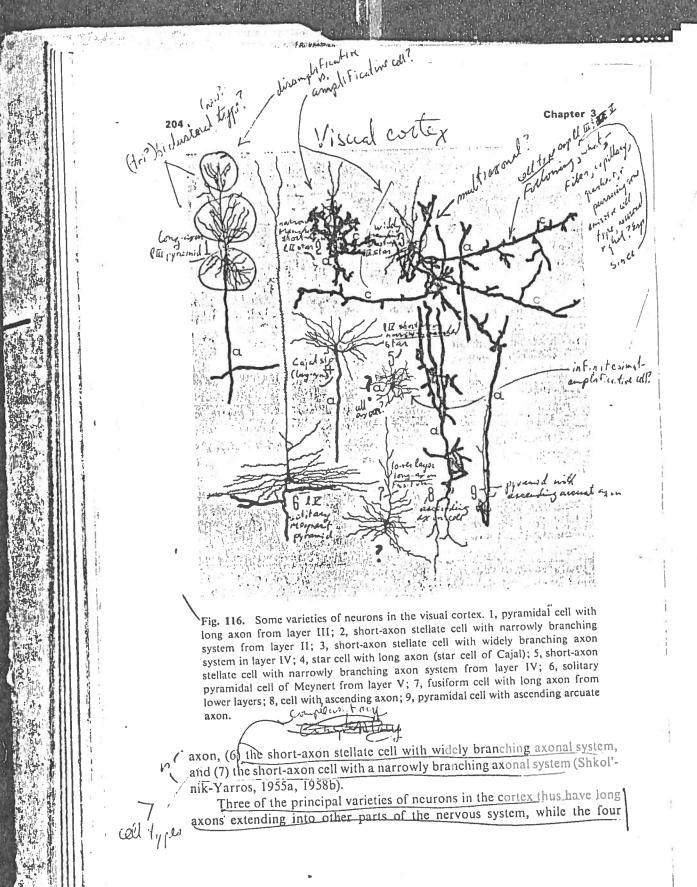
generally discriminable.

It would be interesting to compare phylogenetic differences in the number of centrifugals from primary vs higher cortices to lower vs higher vs reticular stations on motor vs sensory paths, both relative and absolute, as well as and together the matters of centripetals from these stations, in a total and directional picture of phylogenetic change to man. Eg one can imagine the importance of independent regulations of at least three levels: details, objects, and associations of objects as independent and hence mutually reinforcing realms rather than inseperable confusions.

A particular consequence of intersections of complexes with complexes might be that the mind would be absorbed in these types and ranges of distinctions or in "peculiar n-dimensional manifolds" (but note the external adjustments) and that these dimensions

would intensively become very large.

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#### COMMENIS ON OCCIPITAL CORTEX

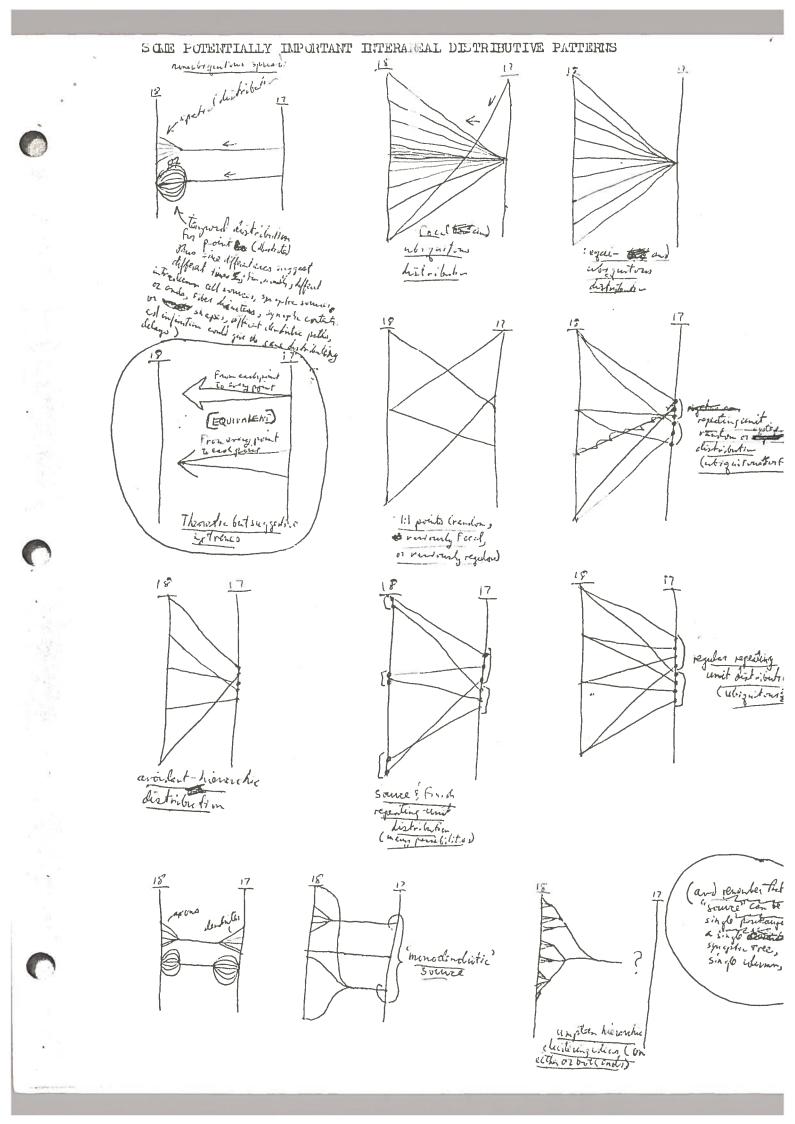
If columns in area 17 are all oriented there might be a natural tendency of the tissue of area 18 to replicate these columnar orientations in its own columns due to the regularity and familiarization of the tissues and the simplicity of the original map, despite the fibrous dispersion between 17 and 18. A gradual decay might be anticipated as area 17 became progressively remote.

If any intercolumnar inhibitions existed in area 17 so that the ideal function of these columns would be asynchronic or successive then it is easy to see how, for any of various reasons, these columns would tend to become uni-orientational. If for any reason the cells within a column have an exogenous or endogenous tendency to fall into synchrony (or biphasic synchrony) then conceivably their allegiance to perceptive lines could be due to the spreading or intersection of annular wavefronts. If there are a certain number of orientations into which the columns of area 17 tend to fall in contrast to one another, or a certain preferential number of degrees for the single orientations and their polarity, this number might owe itself to a certain necessary set of adjacent columns in terms of a described spread of lateral inhibition or the like; in other words, this would be a sequential fractionation of a circle, with a certain independence of sufficiently separate orientations.

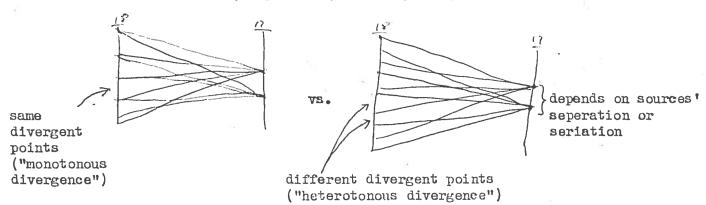
The dispersion of fibers in area 18 might insure the selection of an orthogonal line as the "simple" and "complex" cell properties broke down.

Due to the peculiarities of mouse area 17 it is extremely interesting to know the receptive properties of cells in this animal. It is possible the field width of "complex" cells in area 17 is alike the range of lateral inhibition or excitation.

If the field width of area 17 "simple" and "complex" cells is the fixed spread of stimulation, then the negative boundaries of "hypercomplex" cells could represent the broad dispersion and haloing of these specific introductory fields or the incident juxtaposition of twos of fields. If "simple" cells have long but breadthless fields, "complex" cells could represent the isofrequential squaring of this original length (is there some tendency to aliquots or integers with eg 2°1 rectangles?).



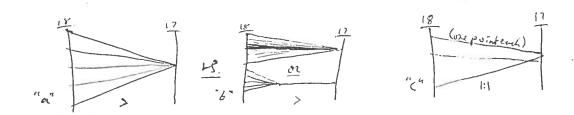
(Three: perfect, imperfectly perfect, and perfectly imperfect)



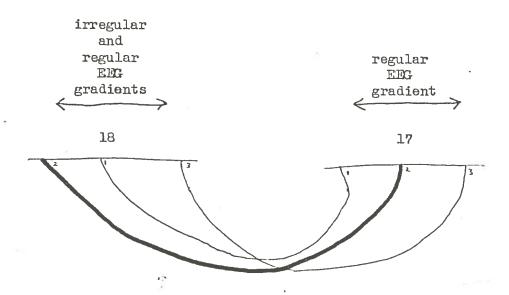
(These 2 could have quite different consequences for Fourier analysis using the EEG for relative or absolute synchrony.)

If the dispersion of fibers from area 17 to 18 increased (less subtraction or more multiplication in 17:18 ratio) this could have had phylogenic consequences such as more detailous perception and more or perhaps less (tradeoff is?) complexity of analysis, association, &c; referral of analytic and other operations to (cubically) increasingly small tissual features or components (eg properly or emphatically, columns poi cell branch fields poi perikarya poi synapses poi membrane points (figuratively)). The reason for the phylogenic increase of 19 and 18 relative to 17 might actually have been to greatly or fantastically increase the axonal ramification of 17 in 18 (and the intracolumnar subramification in the increase (if there is one) in the size of columns); if so, a 17 >> 18 & 19 hodology might give more of such an effect than 17 >> 18 >> 19. (Similar explanation for area 4's shrinkage as the recipient of more frontal areas, and for area 7's enormous increase relative to areas 3, 1, and 2?)

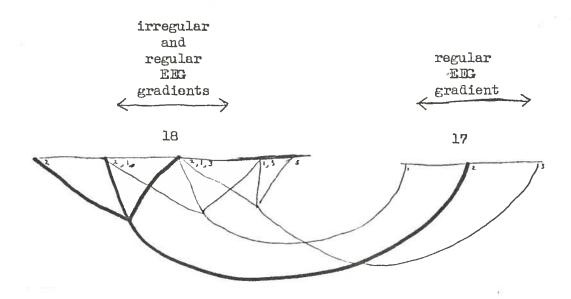
If the contrary occurred, it is necessary to think of the function of phasal or microfigural processing (terms presented elsewhere).



In terms of these figures, each suggests a difference for Fourier analysis using the EEG. The presence of microconic arborizations, as suggested in "b", could suggest 2 basal spatial-frequencies; but various random or (particular) regular terminal arrangements (see "a" and "c") (among other causes) could so disperse the frequencies that one seeks another function for these differences, eg that source proximity might in one case be emphasized and in another relatively ignored. Also consider that the terminal distributions may be random in various ways, with implications for the functional frequency spectrum. Otherwise (or in fact) one might seek a (quantitatively and qualitatively suitable and limited) hierarchy of clusteral dispersions ("hierarchy of cones"), rather than a 1:1 or ubiquitous equi-, random, or "monotonous divergence" distribution.



The flux of pulses from area 17, originally EEC-'synchronized' in that area, will be dispersed onto area 18, having its own spatial-frequencial EEC gradient, as irregular with respect to the EEC gradient in 17, irregular with respect to the arborization of fibers in 18, and irregular with respect to 18's own gradient. Yet since the incoming dispersed EEC will be regular in space and time by virtue of the static or relatively static pattern of interareal fibers and the regularity of its area 17 source EEC, and since phasal adaptation in a complex tissue such as area 18 is easy, 18 will amalgamate and standardize the exchange (first order "cross-familiarization"). The superimposition of sensory information on this exchange (entered at 17) could then or originally exploit this "familiarizing" process ("second order cross-familiarization"); the cross-familiarization could become either greater or more specialized.



- 1. Most primocortices (4, 3, 17) are larger in absolute but smaller in relative terms in man v other animals: the only exception is 41 which is relatively larger.
- Star cells of Cajal are difficult to detect, rare, and give off few branches in hedgehog; in rabbit are clearly bivarietal (radial, & semilunar) and are much richer in dendritic branches; in cat are esp rich dendritically and covered with spines; in monkeys (Cercopithecoidea) differentiation: larger & sometimes giant are found in layer IVb, medium at a lower level in IVb, and the shape of the cells & esp dendritic distribution are very typical; in man there is a very considerable increase associated with absolute increase in cortic area (also in layer IV a considerable number of delicate cells, like the larger but very small, are present; so the contrastic range in size and fineness increases); in primates 3 varieties. (Typical star cells of Cajal: thick axon descends directly downward, to subcortices, may play a role in reflex eye movements, identical with pyramids save for total absence of apicodendrite (indicates involuntariness?), lie in the center of an afferent plexus, have more synapses than any other visual cortic cell, axodendritic & axosomatic synapses of afferents & other axons on these cells, largest pres send back excitation to subcortex rapidest, some Cajal stars distribute but locally, very numerous & most varied in animals with highly developed vision (squirrels, primates), dendrites occur in layer IVb (sometimes far & wide well-developed horizontals, sometimes radial), thick horizontal afferents give off thinner fibers in Gennari's band ending on, connections of with thin axocollaterals & endings running in direction of Gennari's band & also from higher layers, their synapses thus principally specific afferents from lateral geniculate & are mainly axosomatic (pres axodendritics mainly intracortic), fail to develop in developmental defects of eyes (esp susceptible), cones in macula lutea 1:1 ratio & other stars 1:125 receptors (? von Bonin), IG → layer IVb Cajals for eye movements & IG → layer IVc stars for visual image (?), IVb is the region receiving the most geniculofugals; IC layers  $1-4\rightarrow$  area 17 layer IVb stars-pretectal nucleus, IG layer 2, central gray, &rc?; lack of apicodendrite serves faster action sans special delay of excitation in slowly conducting apicodendrite (?); dendrites often like wings of bird in flight.)

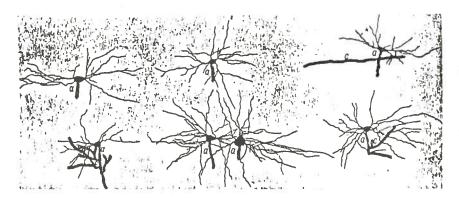


Fig. 47. Star cells of Cajal in layer IVb of Area 17 of the green monkey. Some axons give off collaterals. a, axon; c, axon collateral. (Shkol'nik-Yarros, 1955a.)

#### REMARKS ON VISION

If you're looking at a shape such as a dog you want to preserve the conditioned stimulus or the invariant (which is the familiar, monotonous, or monotypic detail of the dog body's 'interior') along with the variable or dependent variable or more various category and the category which serves the natural motions of the eye, head, and body and perhaps has novelty and/or salience as the division between two (situationally) less attractive zones of features of the random or heterotypic or relatively complex background to the dog's body and the relatively monotonous interior of the surface of the apparent dog's body (ie the category of the linear or grossly linear perimeter of the dog's body. Thus there is no surprise in the fact that we study scenes by tracing paths over features in such fashion that loops form and particular attention is subjectively or objectively paid to the contour; through such tracery and over time differentiation of figural complexity occurs since overfamiliar oversimple shapes (or analyses of shapes) habituate with disfavored rapidity and in any event hold less absolute attraction to the eye which is free to wander; similar to the choice of other shapes, the eye seeking novelty in relation to its past experience contrives to find novelty in the shapes previously exhausted or subsumed at some truncated level of possible feature specificity so that smaller, more complex, "allopopulational" (the choice of eg curves is to some extent arbitrary and a backtracking mind may switch over to other criteria, eg in the sense of regimes of criteria that may temporarily be pursued with an intensity disproportionate to the overall terms of novelty of the object), and allotypic eg-curves may consecutively be turned to in the intercomparison of objects in memory and the present and a progressively intricate, yet well-seperated, analysis may occur. (If one wishes to distinguish synthesis from analysis one might suggest that the particular parameters and values generated momentarily and ontogenetically in the course of analysis may subsequently show themselves improvable through refinement, combination, substitution, or elimination of unnecessary parts or the whole of analyses and that this latter improvement is "synthesis".)

It might be suggested that area 17 is concerned with small focus whereas area 18 with dispersion with the consequence that movements of the eyes such that they obey the perimeter or closure of objects is explanatorily bipurposive: it either clears or confirms cells in area 17 and at once is that minimal and optimal dancelike movement which clears and/or confirms cells in area 18 (eg the two areas might by this gesture be thrown into maximal contrast); since area 17 fires 18, there is a reason why the motions might more-or-less keep to the region of the object, if just by the superaddition of the preferential reactions in 17 to those in 18; also there must be considered the possible ideal for, say, motor extensions in 18 combining with their source through 17. The continuity of motor activity in 18 naturally centers around the reference and motorally traceable continuity of the contour in 17 (or the translation of the excitory point along the large and circularly continuous contour (or virtual contour, through closural average and the preference of continuous discontinuity in the midst of eye motions)).

It is conceivable that nondispersed area 17 is concerned with contour whereas dispersed area 18 therefore with circularity (in the case of a mere looped line against a surrounding monotony) and area (and thus closure and center) or at least with disconnected "homogeneities" (eg many identical objects or a texture).

It is apparent it might be nice if cortex took "leadership" away from lower centers ordinarily causing and regulating eye movements in a relatively or absolutely reflexive fashion, since in this way particular objects or features could be chosen in the arbitrary way of a cortex. But lower mechanisms might be ideal randomizers and contrahabituaters for lower and yet essential features concomitant with occasionally or generally intrudable 'nonrandom' or 'nonhabituating' studious choices of the cortex.

The function of sensory centrifugals might be to allow the higher or highercortic simplification and redirection of analysis, such as the removal of lower analysis so that the higher brain can substitute its own version of the situation at lower levels of analysis (eg visual details, or figures substituted for unnecessary puzzlement over details). The intercalated or substitute supposed details (related to the supposed whole) might serve to bring about closer judgmental comparison of the propositive details with other features of the situation and in this way lead to an experimental evolution. On the other hand it must be noted that the stream of consciousness is a full and economic thing and the retirement of unnecessary details (gradually over the lifetime) could bring about the appearance of ideas that hitherto would not have fit within the lifetime, fit (densely) within the periods of 🍘 analyses crowding each other intensively, or occur because of formerly insupportable complexity; thus the new analyses could be qualitatively different; they would exponentially combine and transform the overall analysis; and that would be vastly more numerous (manifold) than possible without such centrifugal suppression or modulation. Possibly the sensory centrifugals, so-called, suppress sensorimotor reflexes (eg fixations) mediated at a lower level. They could definitely serve active perception by releasing or directing the mind to other stimuli. Ironically, it is conceivable the function of foveation is to serve the serial alternation or comparison of wholes (defined by centers) instead of details, per se.

Another nice thing about common following all the way around a dog body's outline is that creates an inside and an outside in eg area 17 where the alternation has a simple cycle and where even the invariant size, configuration, &c of the dog swinging around in a perimeter as an eversion of that perimeter as the eye moves once around, is a useful constant in the cyclic rhythm discovered and defined in the action. This creates a kind of hole or average annulus in area, lated and thus the monotony of the hole constitutes a proof of closure.

One function of granules in koniocortices could be to give an intervallic snapshot memory so that the first impression of a novel scene will get recorded and subsequently there will be a hull or an indifference to similar impressions, eg so that this first impression may be favored and, as example, intensively analyzed both in itself and by its prolonged comparison with one or many subsequent experiences; this could favor the analysis of fixed structure over undesirable variety of detail or structure. Novel scenes might be filtered through this or filtered at a higher level through transmission of area 17's impression to later areas, and novelty complex accentuated.

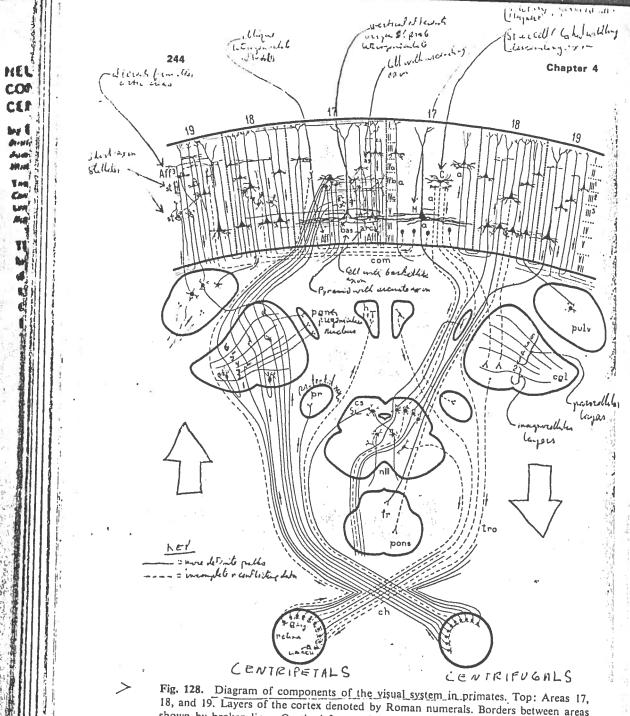


Fig. 128. Diagram of components of the visual system in primates. Top: Areas 17, 18, and 19. Layers of the cortex denoted by Roman numerals. Borders between areas shown by broken lines. On the left, centripetal connections; on the right, centrifugal. Subcortical structures are shown in the middle of the scheme and the retina below. The diagram emphasizes the principal quantitative and qualitative differences between neurons and connections of layers III and IV of Areas 17, 18, and 19, mutual connec-

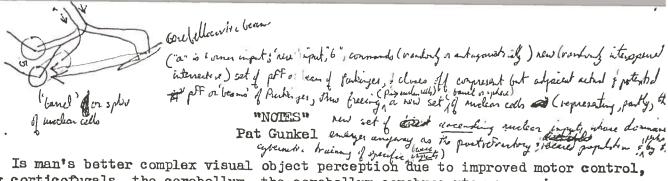
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eg corticofugals, the cerebellum, the cerebellum-cerebrocortex connexions, expansion in visual association areas with/out motor connexions (eg 18, 19, 37, 39; did this account for the expansion?), &c? If so, the size increase of these areas might be much inferior to the increase in their 'importance'.

Similarly to motor processes, is there any tendency to 'roam up and down' the spectrum of simple or complex sounds that could be randomly spectralized and be improved by sensory corticofugals, cerebellar associations, or the like? If all this is true, then man's entire cognitive (eg motor) complexity might owe itself to fineness of peripheral (sensory and motor) control, for the fineness would inevitably be multidimensional or arbitrary (eg, put it, "intelligently wilful"). This fineness would be in 2 directions: toward complexity and away from lower School automaticity.

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Rem

The function of the cerebellar cortex may be relatively simple if its folia serve longitudinal equalization (or over many transverse strips) via parallel 6 10 fibers over a whole muscle re and homuncular or allomuscular succession over the rel transverse axis so that via the cerebellocortex such a virtual line or "whole" ocal may be taken out or (at other cerebellar parts) put in by Purkinje inhibition of the apt nuclei so that efference would be distributed in or outside these nuclei dion if it reflected continuing afference as opposed to nonafferent or postafferent Fa efference, so that new active afferences could push aside (switching) relatively unequal extracerebellar activities (wherever). The function of the extensive inhibition in the cerebellocortex might be to maximize the instantaneity of relevant input or control and the rapidity due to this and due to adjacent inputs and activities (lines). It is obvious that all the cytologic phylogenies known could easily simply increase the complexity and precision, in short the elegance, of this competitive, switching, and heteronomous process. As the parallel fiber is longitudinally or 'linearly' extensive in synapsis, the climbing fiber may be \*punctally\* or sterically so. The climbing fiber could thus serve umpteen purposes, eg removal of specific inputs (causes) as opposed to or subtler than in whole lines (effects)(eg thereby disentangling afferences and activities; note that new patterns and afferent sources would be independent only through climbing fibers), ontogenically sculpturing particular patterns between inputs, regulating the general tonus of the cerebellocortex over the major scale, confirming certain general but specific simultaneous patterns in the mossy influx or cerebellocortic activity ("moment selection"), acutely or chronically removing the corticofugals from the cerebellar activity (eg due to duration of the postexcitory refractoriness of the Purkinje cells, or elimination of their bursts or reduction of their maximum-as-spaced pulsation), causing the Purkinjes to summate certain or general mossy and mossy-related patterns, &c.

It is clear that sensory corticofugals would serve complexity and sharpness of potential or actual attention through looped selectivity (∞ -differentiative homeostasis) since the evoked potentials and pulses returned would inhibit and excite aspects of the efference which could directly or indirectly lead to complexity or "voluntariness" of attention (regardless of seeming mental "highness" or "lowness" at these levels): "subjective attention" and its "mobility". staging of cortices serves any purpose, it might be interesting if special or multipurposive cortices were staged for sensory corticofugals.

Did development of at least the peculiar neurons of area 17 (large star cells of Cajal and solitary pyramidal cells of Meynert) toward man serve the purpose of giving visual excitory orientation, inhibition of other automatic activity in the brainstem (they don't go to the hippocampus?), and/or as centrifugals to sensory stations to inhibit further input upon reception of a non/novel impression so as to create or enhance an eidetic snapshot memory? Since the large star cells of Cajal lack an apicodendrite, this might be specifically so that simple impressions would first have to be processed at the lower levels so that complexity, 'at' higher levels, would be encouraged (and, furthermore, this might not interfere with new impressions, or not without even more complex return through lower levels).

The function of the neostriata may be to somnally clear the or (eg prefrontal) part of the cortex as much as possible so that—against a blank, smooth, random, 'regularly' organized, retentive, 'black' background —each day be started with ideally efficient probabilistic machinery (eg serving best alternation, serial—parallel complexity, uninterferred thought, &c). Maybe the prefrontal cortex has been specially developed so that it could be specially 'cleared' nightly, perhaps functioning as a tabula rasa or as such as some level. One ought not pass up the possibility that similar 'clearing' (for similar purposes) may occur within and beside the amygdala &c and even, even instead, intrastriatally (as the special function of striatal tissue).

### VISUOMOTOR PROCESSES Pat Gunkel

Here is how the visual cortex with visumotor leads may develop phasal states suitable for automatic location, movement, and fixation of stimuli that naturally involve this. Prior to any learning on the part of the cortex we imagine subcortic mechanisms causing fixative motions of the eyes so that the occipital cortex is sensorily informed. Regardless of whether the efferents to the ocular musculature from the cortex are bipolarly or continuously mapped or just randomly distributed in the cortex, the excitations produced in the cortex by sensory experiences triggering movements and by sensory experiences resulting from movements are in a position to become phasally coordinated with oculomotor activity and visuomotor coordination by virtue of the crudely rhythmic or irregular mass and single waves of excitation exiting the cortex through the corticofugals to the centers of lower oculomotor control so that that mass of routes or that mass of cycles or that pattern of coincidences common between the cells (and eg confirming itself infinitely) modulating the eye motions one way or another may be reinforced by the pure sensory events, the associated 'arousal', or a correlable wave of activity deriving from the interference in the motor centers through some intraneural return to the cortex. The gross waves of activity spreading from the cortex may in this way be periodically reinforced in the cortex by positive selection of its phasal activity and subservient substrates. At once, that activity and structure of the cortex ultimately asynchronous with the elicitable activity may be emphasized in specific contrasynchronous modes or negative selection. Clearly these phasal interadjustments can extend their regularity for an infinite complexity of cellular interpatterning or backup and so in practise the distinction between positive and negative states is unclear. It may also be that the motor centers supply afferents to the cortex so that the infinite phasal states of the cortex may be filtered for progressive coordination with the visuomotor operations: the cortex might use the gross and/or fine information of the visuomotor nuclei for gross and/or fine coordinations. In any event, we see that the overall instantaneous pattern of the cortex would be subject to phasal classification. The attractant for ocular fixation might simply be the complexity of the visual stimuli for this would produce the greater excitation of the cortex by producing the greater irregularity in intercellular relations.

## MUCHANISMS FOR VISUAL LAVARIANCES SO THAT OBJECTS CAN BE SIMPLY CLASSIFIED Pat Gunkel

It might be that responses developed by cells in visual cortex develop so that they become reciprocities to activity in distant cells so that units of distance in space and time are gradually ignored in favor of an average integral over these reciprocal cells and the total reciprocal activity. Of course it might be that this mean-integrative orientation also gave the cells a precise (eg orthogonal) set of coordinates (emphasized collaterally, partially, or absolutely) and the information had and required by the cells might specify relative and even absolute orientation and structure in space and time, in short, some degree of minute object perception. The activity of single or grouped cells might be specific in the other cells. One reason for the above might be that "multiplicative engrams" saturate the tissue so that local activity might be deemphasized or equally emphasized with respect to overall or reciprocal activity, and activity specifying complex pattern or again.

The points on the striate cortex might be in the position of taking the circular diametric distances of objects appearing about them (as radii from their loci) as multiples of each other on frequency spectra (this might be in terms of the intrinsic cyclic activity of the cortex), eg such that specific distances would assign values to specific frequencies on a spectrum giving the relative density of any integrals (where there would be only relative and approximate choice of frequencies for the differential comparisons). Since such spectra would be taken it would be irrelevant what position (translation and rotation) an object took (apart from certain distortions due to 'perspective'). Distortions or variations in the specific form took by a type of object might be irrelevant because the definition of multiple classes of object would already have occurred and occurred multidimensionally so that the confusion of forms would only be by the limits of informational criteria or the absolute ambiguity that we already have or that presumably exhaust the situation. Given these prior invariances and their multidimensional classification, the multiple 'viewpoints' introduced by the cells at different loci might easily be averaged over for total field invariance and, furthermore, the precision of perception increase in this way (rather than perception be utterly impossible). For one thing, events occurring anywhere in the past would have coetaneously stimulated these mutually distant cells so that the patterns in cells concerned with this total field invariance would long since have interacted and integrated spectra based on random sets of continuous properties on integral occasions &c. Since Fourier analysis using multiples would at first have been, size would already be generalized and is not a remaining problem. The above is also able to handle many compresent similar and dissimilar objects (and multidimensionally!).

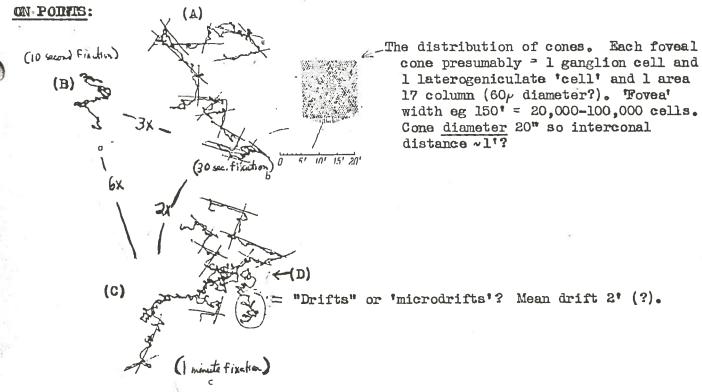


Fig. 54. Records of eye movements during fixation on a stationary point by the subject. a) Fixation for 10 sec; b) fixation for 30 sec; c) fixation for 1 min. The scale of angular measurement in minutes of angle is given in record b, and the distribution of the cones is indicated schematically on this scale.

(A) Note drifts might average lines whose average length equals the average diameter of striate columns so that the latter might easily enregister 'lines'. So are these true or fully random walks or are these intercolumnar adjustments? The Tile

(B) Accurate start or ambiguity of point in areas 18, 19, and 17 (eg producing a random walk-ideal since randomness best for Wiener-filtering nonrandom form)?

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(C) Average 'long drift' (=?) ~7' ≡ average "small involuntary saccade" 7' (identical or do they mimic 'each' other?). (If 7' = 17 cones, then = 17 striate columns = 1000, (if Hubel's physiologic columns are much larger than anatomic columns, do they then suggest the length of these saccades and/or drifts?)). But if 1 foveal degree equals 1 millimeter of cortex 3 16 column diameters, then l column diameter equals 4' so 7' equals 2 columns equals what? (Intercolumnar atomic pairing, as "line" origin?) In cat, optimum line widths for simple and complex cells (in or near area centralis, in area 17) ~10° (eg 7°1) so ~71. Do the field sizes ("simple" 1-20, "complex" 2-3 up 100 or more) approximate some saccade or movement size?

(D) Convergent recurrence over many walks since ambiguity (see above) partial? One cause for drifts and "line receptors" could be that habituation, aversion, re 'momentarily' occurs within a circular field (eg fixative collapse) and then regenerative rectilinear displacement occurs to an optimal distance; thus at some stage on the visual path, for some reason, cells would initially become "linoceptive"

The ironic point of 'these' eye movements might subjective attention by the latter echoing objective movements. It is obvious that because

columns (of cells) in area 17 are phasal, neighboring columns will disperse along spectra and originally solidify invariant orientations.

If "drifts", per se, average 2' (?) or whatever, these could give the center-surror diameter of geniculate cell fidelities as cells prompting jumps (see above) (%), only the lines would not be 'visible'.

What we need is some idea of the interspecific spectra of properties such as receptive line width, length, field dimensions, cell loci (cortex, geniculate, retina), &c. The spectra would then have to be explained.

Does 7º (7 minutes of visual arc) = striate "receptive line" width?

#### SUMMARY

I believe that the sensory experiences of the brain have sufficient order that the function of the brain is not troubling to see. If we think for the moment of visual experience where an object is falling on the cortex it is obvious why the brain is able to generalize over its experience so that we perceive as well as we do. The complexity of events and representations in the cortex created by the basic impression of an object is so great that a great diversity of means will be created by visual experiences for the comparison of different experiences and, furthermore, these means will be so randomly, integrally, and functionally distributed that many aspects of the same object will be brought out or generalized. What experiences come next will only naturally have such similarity to the foregoing experience and such commonality of dimensions that terms of comparison and generalization will begin to sort forms into cases and attributes, beginning with all that is necessary, namely a few terms of comparison that are capable of internal differentiation in the sense of finding the complex, peculiar, and specific generality that exists within the life of experience. Other examples of simple helps lie in the fact that objects that are typically seen are seen for a duration rather than instantaneously, that this duration is comparatively long, and it matters not, partly because of these durations, that the same or similar objects are seen repeatedly albeit discontinuously. And in the variety and yet uniformity with which objects, types of objects, aspects of objects, and aspects of differences between objects are experienced (quite apart from the diffusion of the cortic activity triggered by and reflecting an impression), eg so that objects move and transpose in space simply as a matter of natural experience or even as the simple and complex (yet describably simple, since anything may be begun with or used) averages of their incidence.

The tissue is presumably extremely interested in following lines for these are continuous functions (and as such resemble eye and object motions), hence it's multitudinous cells might be supposed to extract from the irradiative material those pulses with exact or approximate differential continuity (eg color, luminance, texture, size, mode of oscillation of line, regular gradience over continuity, regular tilt or curve, &c) and to pursue these as snakes (or in terms of relative continuity of properties as between alternative pursuits, or multiply simultaneously) to their limit or extent the same cells are able (the long &r high commitment of these cells to the same pattern of activity could, if this is interrupted or just in any case in the next cell-part of the tissue, cause the distant or postsynaptic cells to transfer this pursuit to themselves, so that the tissue would display functional continuity). The commitment of these cells (and the parallel and serial or reactive commitment of their neighbors, so that the population of cells committed would increase) (in terms of total activity, time, &c) could cause the cells in later areas (of interareal projection) to commit themselves to these pursuits; figures could then be removed from a complexly lined scene in order of their ease of assemblage or according to their power from simplicity of construction where the tissue would be assembling in all kinds of ways all kinds of figures from the plethora of small messages coming from the preceding area (where only such constructions would interesto these cells and so that the weaker possibilities would drop out and the stronger possibilities, regardless of absolute weakness, would be selected as relatively more characteristic; it goes without saying that the intensive and random-extensive continuity of the properties of lines would cause their parts to be gathered together and seperated from other lines in this successive tissue).

### ATTITUDES AND REAL AND IDEAL THINGS Pat Gunkel

There is a tendency to suppose that an abstract triangle (whatever that may be, since eg it may be dynamic and complex mental processes expressed to a degree, even in the best insight a man ever had) is what the mind is occupied with when a triangular form in the real world is perceived. Yet concrete forms such as concrete triangles may actually be much more specialized and even much more generalized 'things'. It is a truism that things are perceived as a function of setting and position in the stream of consciousness and biases of the observer. In fact a brain is continually in the midst of subjective perspectives as if it were specifically these perspectives, and not real or seeming parts, that are the brain's concern and, for practical purposes, the brain's means for seeing 'things'. An example might be a triangle sitting on the ground and confronted by a rabbit. The typical occurrence of any such form (and it is typical occurrences wherein a triangle has signifigance) might be with a particular type and proportion of triangle with its large base down or continuous with the ground or foreground, and certainly with what only approaches a rigidly and properly geometric (much less axiomatic!) triangle and a 2-dimensional, nonsolid, and perhaps empty triangle as opposed, say, to a nose or treetop. It may actually be advantageous for an animal (or a man:) to customarily perceive a triangle as basedown and without high, complete, or any rotatory invariance (indeed, the rotated triangle may more nearly suggest to the animal another form at another orientation). rotatory invariance may actually bring unnecessary complexity into the scene or act. Men have difficulty substituting perspectives, even if the adopted perspective is arbitrary: reversing optical illusions, reading upside down, reversing thought processes, re-examining a picture, &c. It is possible the very frequency of things or the complex associative frequency of things determines much of the way we look at things and gives a certain arbitrariness to perspective (since alternative associations of things and depths of association are potentially infinite, some exclusion and some choice must occur). It may be that animals differ in the length and complexity of the evoked potential and in the tenacity with which the hippocampus perpetuates interests, and hence come to differ in their quotient of self-dissatisfac tion and in the degree of their fascination with 'types' and 'degrees of perfection' of invariants.

It is an interesting idea that mnemic associations build up in association cortice so as to yield excitory confluences inducing invariances by having become, in phylogeny, more strong, acutely or chronically, than the lower cortices or rest of the brain in seizing the motivational centers of the brain and hence the center of the animals attention, wherein its attitudes toward the real and ideal may be suppose to form, with quantitative &r qualitative progress in recognizing and attending to invariants. Phylogenesis of masterful two-way connections of the frontal cortex with the hypothalarms &c and of very gradual ontogenesis of the frontal cortex (eg synaptogenesis), perhaps concomitant with sensory interposition before motor product could well have favored the teased emergence of excitory confluences inducing triumphant, successive, and entangled invariants of action, reaction, and perception

### ON IMAGINATIVE MOTION

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Pat Gunkel

Pat Gunkel

Relative blurring in the superior colliculus (and related cortices) could easily change the apparent distance of a scene (just like general inhibition in the inferior colliculus could give seeming distance through attenuating sounds) (contrarily, in the cortex groups of cells or cell functions could inhibit any other  $C_{\infty}$ and strengthen themselves—or simultaneously—to give selective attention to complex aspects of stimuli); this might not hold in the lateral geniculate since the other station might be more related to the relevant reflexes (motor perception of distance); relative deblurring in the superior colliculus (by excitation & inhibition?) could give the illusion of approach. Cortices (eg area 37) at namer south...
reduced the elementary structure of the scene, eg occipitally) connected with the reduced the elementary structure of the scene, eg occipitally) connected with the reduced the elementary structure of the scene, eg occipitally) connected with the reduced the elementary structure of the scene, eg occipitally) connected with the so that subjective attention could operate independent of motor processes and could switch positions in a scene and focus over a spectrum greatly in exaggeration, and in abstraction, of what the 'realistic' motor centers could do by sheer motor changes; the ability of these cortices to motorally switch over aspects of a scene could give them an autonomy and flexibility in their perceptions so that, just as an eyemotion can cross over from a red patch to a green, this cortex could shift cognitively and imaginatively along spectra of association of objects and concern the progressive anticipation of whole objects (spatial successions and delimitations) from parts, and could specifically concern the changes or transformations in objects and scenes.

That a patient with damage to his area 18-19 cortox can see a circle's boundary, or a part thereof, and its center but not at once suggests that it is largeness he has trouble with (if he cannot construct wholes from fragments serially it might also suggest the relevant transitional evoked potentials are forfeit) and that perhaps he could see smaller equally complex forms? But with damage to Wernicke's area alexia or inability to make sense of letters may result su(x) esting that focal functions may have developed in man to an extraordinary degree, such as an ability to remove arbitrary detail from a scene or to get structures progressively compared (by the ontogenic movement of thought) so that the acuity of form perception goes up; perhaps subjective attention (quasimovement) has come to replace overt movement, and then note that there are no stationary limits on the evolvable rapidity (and abstract condensation or simplification) of subjective, unlike objective, movement, so that these subjective 'movements' coming into dominance could lead to abstract thought (directly!), arbitrarily (the gradually) accelerable thought, &c. Presumably this is the function of the phylogenic development of the frontal cortex subjective movement (note how important it would be to inhibit, various sensory, motor, cognitive, emotional, and mnemic patterns to compare them with one another-eg to inhibit a pattern for the body in space that it give a system of coordinates, or to inhibit a picture of the environment or scene that it serve comparative reference, orientation, memory of progression, &c), arbitrarily accelerable, and abstractable til whole movements -- with sensory-causal consequences -- could be performed in the head and whole events could be gone through, so that the brain would take off and pursue imaginations, developing anticipation on course).

The important thing is that the motor be developed over the sensory cortices because the motor is selective and thus can lead to the voluntary and the mentally reconstructed. And before this self-making independence is phylogenically possible the brain must have developed enough that behavior can be and is played out in the head as wholes with their consequences.

( Just to These set Anomace!)

When looking at a face my visual cortex diffracts it into 16 billion, possible forms with enough commonality of criteria between them that the precise location is irrelevant. Each of the point-sources in area 17 may imbibe activity over a certain radius or radial gradient that may include the complexity of excitation, lines, textures, solids or their collapses, or whatever, but in any event this activity is funneled into the next cortex or into the next synapses in the same cortic area. The possession of certain reticularlike loops may serve generalization and negative generalization (exclusion) over a large slab of tissue, such as the whole or next area, and additionally progress the perceptive process, eg serving to intercorrelate remote cells or their patterns or to select holistic responses of the tissue for embodiment of engrams or to tie parts of patterns together at specific moments of time or to select certain 'pairs' of spatially disjunct cells or patterns in a progressive pairing or to freeze patterns so that they can be superimposed on themselves or other patterns via eye movements &rc. The degrees of typal similarity between any possible visual forms are so great that over time there will evolve in this tissue linkages between all experienced forms and between all the regular and irregular patterns of connections. The complexity of these patterns will include transformations so that the (in fact progressively convergent) wealth of experiences will find and involve invariances whose progressive substantiatio and interclassifications will serve as part of the vehicle for the universal comparison of forms, the record of experience, and the land of spontaneity.

However, it may be speculated that in animals lower than man there is inferior perception qualitatively due to habitual tendencies in these animals that are less determinate in man, who can perhaps control and does experiment with his habits. These habits would be of the nature of half unfortunate simplicities or tendencies towards such things as thinking of or seeing objects only one way in space (eg vertical and basedown), only literally (eg specific trees as opposed to a universal tree, only a certain color (at the extreme), &c. In man there may be neuroanatomies serving a continual experimental variation and intercomparison of features, objects, aspects of perception, and the universe of experience, or at least a relative flexibility; indeed, this process may have gone so far in man that his perception may gradually evolve into what can be seen and generalized as a result of innumerable and lengthy predeveloped assemblies of associations of objects, or the relegation of habit to these constructive (analytic and synthetic) processes. One simple reason for this might be that in lower forms analyses stop with simple recognition of an object whereas in man these analyses take on a life of their own and endlessly analyze, reanalyze, and compare impressions, or the interest in such impressions is autonomous as opposed to led by some other lower drives. A subtler reason might be that in man previous analyses are inhibited and avoided or themselves inhibit in such a way that features or recognitions are added to each other in indefinite and self-interested or open-ended constructions or at least constructions whose systematic tendencies are not overregular. It can of course be mentioned that the provision of extended motor and emotional cortices in the frontal lobe could supply intrinsic interest to (now emotional) patterns of analysis (which is identical with the products thereof) undertaken in lower cortices and subcortices; eg the image of an environment or of a particular face could gather about itself, or come to obtain in the frontal cortex because of, emotional signifigances that would be able to act back (directly or indirectly) upon the occipital cells in their serial and parallel selection of eye movements, movements of subjective attention, and qualitative transformations of subjective attention; thus eg these three processes might be made to pursue degrees of positive fitting with single and tentatively combined association ideas, imagery, or memory in (or connected with or analogously to) the prefrontal cortex, say through inhibitorily leading to complication of perceptive interpretation or a momentary act via suppressing an oversimple or purely reflexive pattern of movements or transformation of eyes and attention.

It is obvious that cortices receiving dispersed afference would only naturally be concerned with combinations and comparisons of impressions; progressively higher or later (following many dispersions) cortices would likewise be concerned with progressively higher or abstract impressions and with cellular events that were not already apparent in lower cortices (eg coincidences based on translation of objects and displacement over the visual field, creating a realm of relative or novel invariance, would no longer be novel or eventful, at least to the same degree, in successive cortices; in fact, these prior differences would be tendentially static or neutral in successive cortices; thus what might interest these cortices would be pure and progressive figural classification or even, or in the next cortex, interclassification between already internally convergent or self-isolative forms, or assemblages of forms in static or dynamic settings, ad infinitum).

It is an interesting idea that in man konicortices, (granular, inhibitory, local, recurrent, intracortic, plexal, stratal) might either snap or glue sensory impressions or prior patterns (as vocal, emotional, acts of retrieval) so strongly that these would then seize directive or motor processes and compel these to obey and compare intricately foregoing, cumulative, new, &r present impressions so as to complicate and systematize the analysis of these impressions (simple, eg pyramidal, collaterals could do the same thing, eg a la corollary discharge phenomena, which might serve the propriate intensification of analysis); this might do something to explain the amazing development of the cytoarchitectonics of the striate (over the following) cortex, eg the highly emphasized development of Cajal's long axon stars and Meynert's

long axon solitary pyramids, prob subcorticopetal cells.

The interesting possibility is that the cells in the visual cortex (eg at the second synapse over the first dispersion) respond to area (their linear receptive properties are not incompatible with this suggestion) or, specifically, to areal shape of figures or features. Or if they do not, perhaps those in area 19, 37, or

the like so do, or eg respond to the shape of closed wholes.

In any case, the cells after the first occipital dispersion, the termini of these dispersions, would be in the position of imposing spectra of many sizes and shapes, compresent and random, on the objects they experience. These would be flattened between all the different cells so that only similarities between and within the variety of forms (by the relationship between their specific details and between their types of order) would tend preferentially to arise at the third synapse (second dispersion) and would be massively indifferent to the cruder statistical variations of the cells not yet invariant to the typical transformation of location, orientation, distortion, &c. Furthermore, the cells after the first dispersion would be concerned with the incidence of stimuli (points, lines, and plana) into each other, so that the cells after the second dispersion would unite these regular patterns of incidences and rather have as their concern the simultaneous (and, subsequently, serial) uniformities emergent from the varied but correlable patterns of incidence and the procession of varied uniformities in ongoing (but similarly described) experience.

Possibly the development of konicortices or the like gave man his (longer, fuller, vivider, more flexible, more assertive, more retrievable, more concrete) longterm memory for the gluing or snapshotting could have been cumulative of traces, this cumulative tracery might become progressively or absolutely assertive, or the memories might be held temporarily but allowed to reach the hippocampus, prefrontal cortex, &rc, or might serve simply the analysis of noninstantaneous correlations (which might evolve or convert the mind relatively or absolutely toward temporal correlations), or might serve intermomentary correlations so that the subsequent correlations would be spun out of these temporal or abstract correlations, or the holding might serve to emphasize dispersed correlation at subsequent cortic synapses, or might serve the progression of eidetic memory by creating or complicating local-correlative microcircuitry, or might cause higher analyses or concepts to draw on specific but immense collections of details (and perhaps then embody concepts therein), or might serve the prolongation of the analysis of impressions, &c. (Analysis of the start of particularly interesting if the hippocampus or prefrontal cortex controlled the start of a restauring and the prolongation of particularly interesting if the hippocampus or prefrontal cortex controlled the start of a restauring and particularly interesting if the hippocampus or prefrontal cortex controlled the start of a restauring and particularly interesting if the hippocampus or prefrontal cortex controlled the start of a restauring and particularly interesting if the hippocampus or prefrontal cortex controlled the start of a restauring and particularly interesting if the hippocampus or prefrontal cortex controlled the start of the prolongation of the analysis of more particularly interesting if the hippocampus or prefrontal cortex controlled the start of the prolongation of the same particularly interesting the prolongation of the particularly interesting the prol

The fact that the acceleration of the EEG is associated with the acceleration of thought, novelty, awareness, even memory, &c is very important for it implies \* Manage that there is some mechanism and that this mechanism works through destabilizing the intercellular (and hence just cellular) patterns, and that perhaps these discret " patterns are ordinarily tending to freeze and become 'rigid' (perhaps this could give overretentiveness of memory that would be useful in a way in lower animals), but that their degree and longtime pattern of changes of states is importantly alterable and was perhaps (the ratio, pattern, or control) changed toward man in evolution (where the effect of higher, continual, virtually continual, or highest destabilization, rapidity, particular coherence, amplitude, &cc is unknown but intriguing). It is particularly interesting if it is especially this mechanism whose regulation was removed from the subcortices and given over to the cortex or its higher parts, say autonomously or open-endedly. It is likewise interesting if to some degree, toward man, the parts of the cortex could have acquired some relative independence in their EEG (or vice versa, if eg coherent merger of motor, sensory, emotional, association &rc KEGs could have increased, for various hypothetic purposes), eg the association from the sensory cortices.

Possibly perception can or can virtually occur sans eye movement, or could thus have developed, and the movements rather serve to bring different parts of the visual field into serial or parallel (since particular and obvious elements need not be involved) associative combination. If this is the raison d'etre for the expansion of visual association areas, the ideal for these areas might be to acquire independence of lower processes, motor, reticular, or otherwise. The real question is what are the eye movements of animals below man (all the way to the invertebrates), where are these controlled, are they less selective, are they less independent of lower mechanisms, &c? The function of eye movements, in man, would then be to correlate random and progressively ordered (or orderedly random) sequences of parts of scenes: eg what does a corner have to do with series of corners, what does a face have to do with a tree, what does a stance have to do with a circumstance, &c. But not only would "eye movements" be important if brought under higher cortic control. The eye displays several regimes of saccades and drifts and in each case the cortex might profit if subsuming control, eg by correlating details with wholes, objects with environments. Furthermore the cortex has such extent and perhaps such wiring that it is able to hold large impressions for times, so that this subsumption of control would accompany a parcellation of the environment or of objects based on larger patterns of recurrence and perhaps interactions thereof. Other changes in the eye are dilatory, accomodative, parallactic, fixative, and eccentric. Thus the vividity, focus, (and note that deviations from focus, convergence, &c could serve subjective understanding and measure and perhaps objective comparison), distance, duration and stability of single (but thence comparable) impression or perspective or choice, and fullness and readiness of local-peripheral, distant-peripheral, structural-peripheral, and peripheral-foveal correlation or association could be maximized &r controlled. It is conceivable the inhibition of a sensory nucleus, such as the lateral geniculate, by a higher cortex could serve the taking up of images into that cortex and the simultaneous related liberation or aversion of the lower cortex or centers. It is possible the association corticofugals to the sensory nuclei could regulate the diffusion of details or forms between each other over the visual space or the degree which these are associated or dissociated (as the effect might be); or, since presumably these nuclei acquire preferential or structured interpretive patterns, these patterns might be regulated in their strictness (eg line sharpening or obliteration, same for other geometries or functional patterns). In the above fashion an impression such as of a face might be made to arboreally anticipate series of other impressions into which it might fit and selection could occur of overall patterns (implicit concomitants).

By patterns of eye movements customarily following contours and closing forms there could evolve in a tissue automatic tendencies to look for and measure lines, loops, and other forms; the patterns inherent in any cells once participant in the production (even through modulation of production) of eye movements could automatically apprehend patterns in their own fields which, if pursued, would involve these regular eye movements and these regular figures (furthermore, the recurrent collections of eye movements concerned with other visual loci would lead to a passive development of such immobile or uncentered figural perception or development of forms); these might be active (if amotoral) pluralistic (parallel) tracings of the figures or implicit figures present all over the visual field or atemporal linkages of suitable eloments (eg relative continuities, relative gradients, averaged curves, bound curves, summed angles, &c). This parallel process need not stop at simple linearity and closure, however, but could as well extend to pluralistic classification of forms and the merger of these, sofar as possible at one time or under one interpretation, into overall reductions of the scene (since the scene would continue or is unique, the interpretation could converge to that lesting generality which describes the scene in itself as an apparent maximum exclusion ("negative apex"); for this reason "predictive" processes could be at work for they could cause great condensation of the analytic process by juxtaposing detailous or overall memories possessing apposite contrast (eg if the scene was a make of car and the recall was another make, the (multidimensioned) distance between the image and the idea could provide a measure that, say inherent in the recall, could directly specify some exact possible reality (an invention that could serve further classification, all this simultaneous with innumerable convergent and interconvergent processes whose ultimate end is simply exhausted surrender to the present image)). (Interestingly, in early life peripheral vision and eidetic memory could serve the recordation of details, and in later life foveal and selective vision could serve the rapid and associative identification of a scene serially based on the fewest parts or the maximal implications of little, maximally developed in serial terms; conversely, in early life foveal vision could record details that, in later life, could be used in peripheral vision rather concerned with wholes). It would obviously be interesting if different cortices had extrinsic or intrinsic clocks such that eg area 7 merely collected and collected details for many seconds or minutes and then took periodic inventory, the prefrontal lobe did this for days or months or years (eg by late empowerment); since there are infraslow rhythms in the brain, cycles are commonplace, and there are cyclic and release mechanisms in the brain (eg pineal development to puberty and the thalamic midline may degenerate in late middle age, so that longer periods of time (and integration) might be stressed or empowered) such an idea is possible; one might therefore search for all late-ontogenic or ultralong-cyclic changes in man's brain with the thought a pattern resides in them which throws consciousness to all of time, the world, and abstraction.

It may be wondered whether or not there is a natural continuum for these serial eye movements so that they would blend into or cause imaginative processes of the mind, processes beginning with an attempt to subjectively reproduce potential patterns in reality; these serial images would thus become the processes of thought. Now by the time these reach the frontal cortex they would be concerned with sequences of actions; yet sequences of real actions would have imprecise fits with these imaginary or mnemic sequences; thus the great signifigance of the basal ganglionic relations of the frontal cortex become apparent for one of these sequences could substitute for or alternate the other (and eye motions could substitute for bodily motions and vice versa, eg), but above all the serial images would be linked with causation and would spill into purposeful delays (furthermore, the serial images may thus implicate the consequences of actions (if these two things, motor vs sensory, are kept seperate, the occasions or cases of their interactions may be splendiferous for the interaction would be turbulent  $\Lambda^{nn}$  continuum (each point of which would be a realm of consequences) would be 'passed over' (giving extraordinary thought)) and these implicate the emotions (if this triadic merger occurs, it could create and deposit in temporal lobe cortex longterm and cinemic memory, ie the latter's cells would embody deferments).

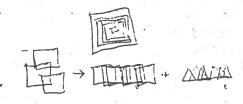
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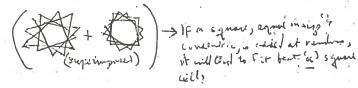
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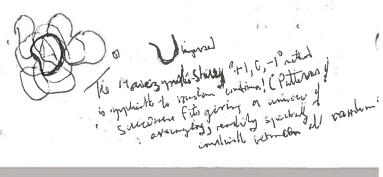
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(cf. p.5" Poss. bl Object Ward room ! The hadges")

Take my work on zonular microcircles, and reapply this so that zonule = nidulus also area, and microcircle = nidular point also nidulus, and then do the spectral analyses.

To simplify thought, take 1-dimensional visual forms and 1-dimensional cortex.

Progressively definite and intercorrelated pieces of information.

Note that the niduli counterdescribe one another to generalize over the displaced, rotated, &c forms.

Due to "euparallelism" progressive pieces of order can be removed here and, second, these pieces will universally contribute to the description of any form.

All I want to get from this is an element for a dimension that can be "a" cross-spectralized. "e" "f" "g"

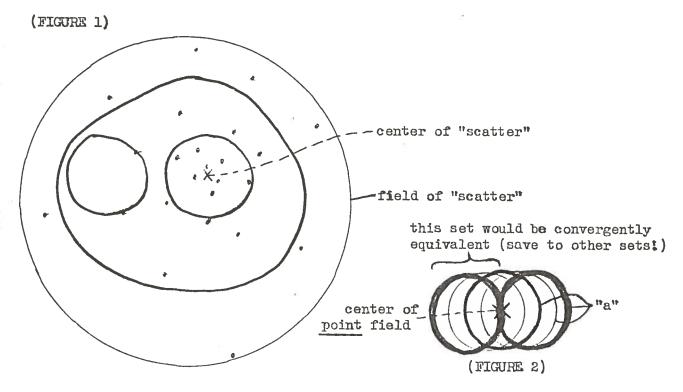
"b" is large and "d" is small. This creates a relationship of relative size that leads to a spectral dimension of intermodulatory size. Further, the specific reach between different "arms" of the niduli creates a spatiotemporal pattern matchable by reaches based on other arms (whose relationship in space is fixed). The absolute position of objects is just not specific. The niduli may get into the position of responding to relative contrasts between arms and within percepts and of grouping together and separate from other textures, textures, in the reduction of forms looking like and marked by textures.

Objects falling outside the reach or place-points of specific niduli may constitute no special problem (1) if the niduli are intergraded, (2) if the niduli are in fact so diffuse as to completely overlap, however unequally, one another, (3) if the method of analyticosynthesis is just to find the isolated sets of available appearances so that these need not undergo special integration to associate with specific engrams so as to produce an adequately specific favored collection of data, &r (4) if the niduli are reintegrated by successive overlapping sets of niduli.

The ideal is an "n-dimensional continuum". When you have got an n-dimensional continuum of this kind, all movement does is to increase the particular description that you have; as a problem, movement is irrelevant; and movement is equivalent to size, so size changes are similarly trivial; tho both size and place differences cause different cellular excitations which therefore can be subject to their own ranges, yet ranges correlable with the above.

To be simplistic, the (quantitatively and qualitatively) more shapes a given shape is broken up into, or the more comparisons there are for a given shape, the more correlations are possible between diverse shapes &r the easier it is for intercorrelation of shapes (esp for finer, more complex shapes and their dimensions—note that 'essences' are destroyed by the concept of random or n-dimensional continua, replaced by infinite variation and autocorrelative approximations) to occur in the tissue and the easier it is for the emphasis to be thrown onto invariant structure instead of now-submerged size and place differences which at a lower level forbid association.

See Fig. 1. For a "scatter" a circle would average the same shape regardless of position or size. Yet a triangle or irregular shape would differ, eg because the parts of its perimeter would differ from one another-forming a, eg densiform, spectrum. A reason for this might lie in the local orientation ('curvature') of the parts of the perimeter to nearby points of the "scatter" (eg, such relations might be summated at the scatter's nidulus, say as a densiform analysis). intensive-extensive ranges of a random continuum could exempt size differences of overall figures, eg for a certain averaging, so the emphasis would decidedly be on "turning". Note that a modular texture (eg of microcircles within the field of the "scatter") would automatically use the modules idiorhythmically for comparative and differential fit of the 'modules' (and note that the variously eccentric (to these points) modules would form a peculiar spectrum susceptible to a densiform analysis or an analysis wherein the evenness (homogeneity) of the variations would be central and thus seperable (eg giving deviative subspectra of difformity, intercomparison of 'modules' or forms, &c)!; perhaps a biaxial or Wiener analysis could serve this seperation).



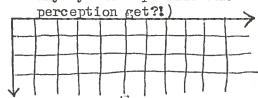
See Fig. 2, "a". These 3 relatively eccentric circles would be the (central, middle, and peripheral) extremes of a true "self-defining continuum"; the "scatter's" nidulus would be in an excellent position to isolate the peculiar spectrum of this continuum so that only difformity would veer from this spectrum, and therefore classify different textural forms = forms of textures. Now the totality of ontogenic experience would be in a similar position of reduction to texture, regardless of the size or oneness of objects, as "self-defining continua" differing 'only' by difformity Evidently unique events could then (eg as scattered over many "scatters" and their points) correlate with such continua.

Ways to recognize faces:

AXIS #1

find the distance between 2 eyes (very invariant anyway—how specific can

AXIS #2 find the length of nose

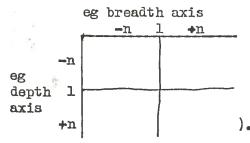


Thus simple biaxial matrix gives great specificity for faces! (Then other axes all give n-dimensional capture, using only approximations, of unique face).

So particular faces should actually be unusually simple objects to pick out:

As a 'third' axis, mottling on face could be Fourier- and densiformly analyzed
to give 1-dimensional or n-dimensional analysis of complexion.

Suitcase: Color axis (do cross-spectral analysis with all other experiential colors—use other axis of size), size axis, textural axis (eg Fourier), material axis (soft), use curve shape, curve spacing, asymmetry as to size, use depth rendering (eg parallax, focus) preparatorily for proper measure and analysis of other axes (if length = 1, then:



Disregard breadth vs length for symmetry about matrix (duplication).

MATRIX (gives 3-dimensional asymmetry:)

Use various shapes (eg let longest rough or factual diameter = length, then use 90° twice and approximated for rough main mass) eg cube (or block with 3 axes unequal, eg 3:2:1), triangle, sphere, &c for a few basic shapes, all matrixed, should together give great specification.

Color: Take cumulative spectrum of all colors in world (eg simple, per object, &c-for many axes or coanalyses) (= / www.or ad infinitum), then take Fourier analysis of: 1) all frequencies (eg wown or wound) moved over the histogram, 2) rescaled to move over the histogram enlarged in those parts containing greater density of occurrences, 3) take continuum or universe of (partitionally extended) random samplings of isofrequential, isodense, &r Fourier spectra and ever seek clustering, and 4) extend across all universe of continual experience using these exploratory criteria ("summary prediction method"). Exx: 'Scatter' over spectrum removing point samples of intensity or spectralize and then randomly sample densities (ie clusterings of intensity); try taking It is conceivable certain random, 'golden', mean r&c nonmaximal densities, &c. extraordinary ('blocked') specificity could come from this treatment such as to transcend arbitrary, complicative, noncovariant, or overlaying variations in experience masking universal chromatic invariants.

Complicated prediction: Take a coat lying down. A zipper is an extraordinarily identifying feature. It sharply narrows the universe of possibilities. Consider the asymmetry of the object and the deducedly apparent size of the object (eg in ratio to size of body): these are two extraordinarily narrowing axes. The size of the coat may be taken in ratio to the zipper's size: this almost right there makes a coat probable in the natural dimensions of experience. Once these criteria are applied and accepted the object may be taken as a coat and its current preanalyzed and analyzed appearance may be intercorrelated dimensionally with the generalized but specific coat in the memory, and other objects may "cross-cut" (eg differentiated by contrast).

Both color and fine and gross (eg whole scene, which can be extraordinarily specific just as a 'texture'! (note that textures may be taken on an infinite continuum of levels of random samplings of intensity, spectrality, density, working pattern, random clumping (random hierarchizing), &c:)) texture perception (both easy to develop theoretically into great natural specificity) may be much more important in perceiving the complex form of the world than is often thought (eg perhaps in early ontogeny of later relatively independent form perception). These 2 may account for the extraordinary developments in the visual nervous system toward man (eg small cells). Such textural analysis obviously also applies to sounds and to somesthesia. The purpose of the fovea might actually be the better sorting of the world by relying on some smaller level of structural and chromatic texture to distinguish objects initially or ever, where the periphery might serve form perception derived from previous foveal criteria. What is texture? Is it the densiform assortment of object size and the size of their interstices, or is it the size of relative discontinuities? Or is it the densiform pattern from an approximate line drawn through approximate continuities (eg around simplest-averaged curves, straight and randomly over surfaces, by granular grouping, &rc)? Or is it the natural random clustering of visual scenes and the 'curves' & produced by the superposition of these clusters? Note that pi (π) gives a mode that may (eg) be used to give clumping of shapes and Fourier analysis of asymmetries. Also note that symmetry analysis may give such modes for cornered shapes (eg square); the tendency to corner is bipolar, ie opposite as a pole to a perfect arc.

Do people who are completely color blind (just rods) from birth have any problems

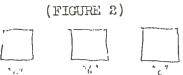
in form perception or in the fully complex world?

## EXCITORY CONFLUENCES INDUCING INVARIANTS Pat Gunkel

(FIGURE 1)

Consider the tremendous excitatory complexity that must be involved in seeing a form at any angle, "a" or "b". Then it must make opportune an equation of "a" and "b", so that whatever initial or final complexity

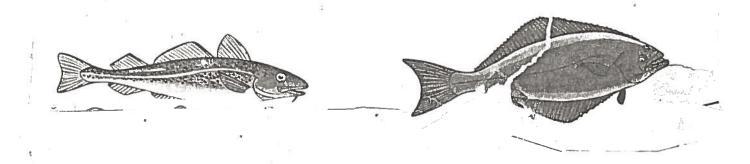
would be involved in functional identification of "a" and "b", which would contribute to orientive invariance, would be less than the complexity posed by the nonidentificative independence of "a" and "b" as two seperate labors of the brain. Averaging over a long period of time, there would be a tremendous tendency to effect this fusion and develop all tissual processes subservient to this fusion. Such fusion would engage that mass of associations formerly proper to the hitherto seperate forms in a greater excitation or greater excitatory resolution, accounting for the forces necessary for this idea to be credible to ourselves. It is apparent that all forms (eg different sizes) would stockpile a tremendous number of associations, the force of which could serve the progressive unition of experience in highly transcendental (relatively invariant) classes.

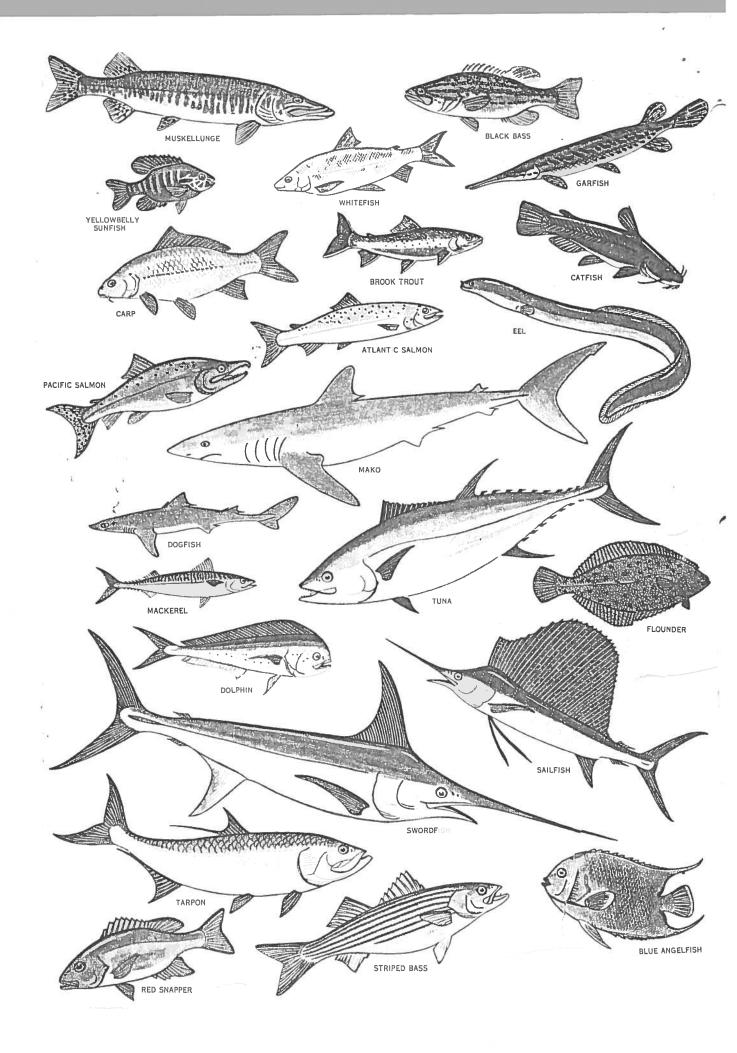


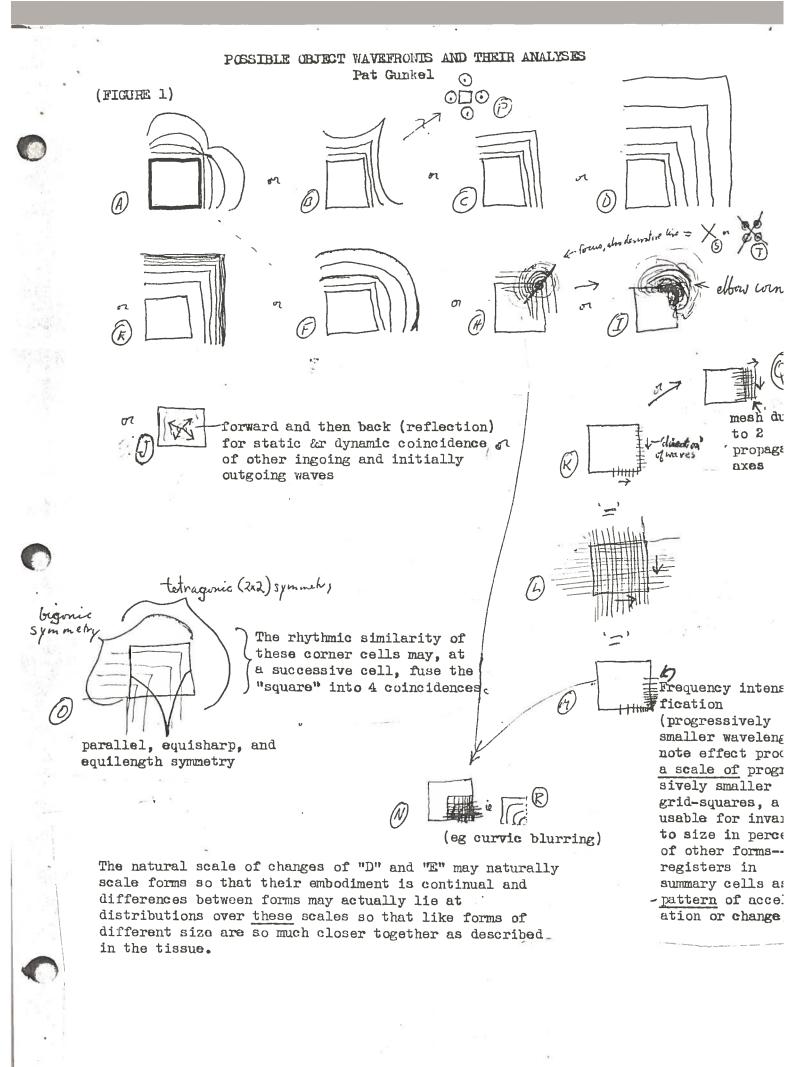
Now in Fig. 2 one encounters identical shapes—squares—at different locations, "a" and "c". It is an important fact that, for all kinds of reasons, the shapes one encounters in early experience have no

tenacity in the positions and coordinates in space they occupy, and even effort is of little avail, considering the intervals in time for adjustment, the multiplicity of simultaneous forms, and the heterogeneity of forms (regardless of their homogeneity). Yet events such as "a" and "c" have stockpiles of associations in the tissue, shortly after they first occur, and do, on occurring, generate complex yet regular patterns, characteristic for the shapes, correlable, as regular, with those patterns proper to other forms or occurrences. The regular propagation of these events can lead to the filtering in the tissue of interregularities from without the noise, both as modification of formerly proper patterns and as the introduction of new, specifically common, yet characteristically common, patterns, say in intermediate cells. Now these patterns created by the instantaneous or noninstantaneous interaction of same and different forms at spatial loci can also serve other loci, events, and forms, "b", due to the relative simplicity of the engagement of the other groups of associations in the disturbance of the tissue. The bias of the tissue would be to pick up whatever simplest transmissive patterns exist.

In the short-sighted or deceptive immediate sense, the greatest excitory complexity would be represented by the non-invariant impact of the object; but in reality the greatest excitation would be that drawing on the total range of experiences or lifetime of the tissue, so that all the memories would have this tendency to converge so far as they can bridge differences to express their invariant conjugates. This tendency to excitory confluence would thus explain the quest, the special interest, of a tissue in invariances or ever higher invariances (ie, ergo, the ever greater confluences). This accounts for the "force" to invariances. This "corrective" dynamic is distinct from and additional to differentiative summation (intrinsic or self-association of objects), diconvergence, and interclassificatory convergence of the types of order, ia. One sees here forces of diminution, augmentation, and substitution arranging the material of the mind. Of course the mind resists excess excitation. How, by what controls, and, third, by what modulations? Might there be important phylogenic transformations or alterations in the modulations? Moreover, excitory and inhibitory processes can concur and confluences be a seperate matter or derivative.

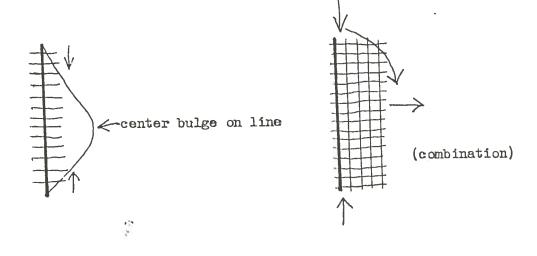


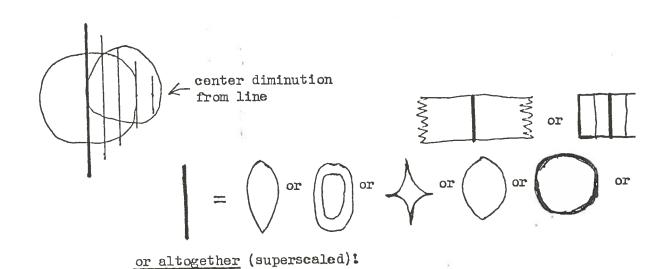




THE LINE:

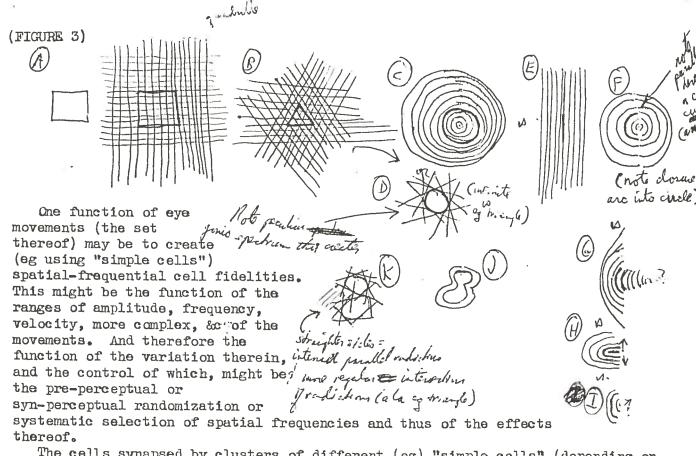
(FIGURE 2)





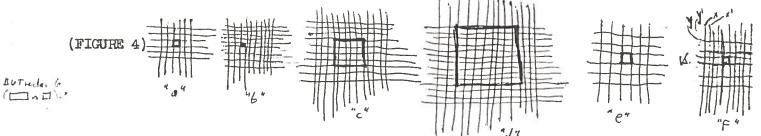
It appears that a simple figure such as a line or square may produce a multitude of static and dynamic representations, or really that each produces its own characteristic set thereof, and that, moreover, these representations may interact with one another so that there is only naturally produced a gigantic, infinite, and specific universe of representations, whose qualitative differentiation may serve to bring the universes of representation of other objects into proximity &r intersection at some &r all levels of representation. A most amazing example would be the fact that, by these spreading representations, a line may suggest a square and vice versa, and both a line and a square may suggest a circle. The degree to which reciprocities are not perfect is fascinating in suggesting to us how tissue may use its own criteria for distinguishing different forms. Obedience of more complex forms to these occurrences is interesting.

The function of "simple" &r "complex" cells may ironically be to serve recognitio of curves (as lines). Eg as the eye moves over a curve the tangents are brought together as a straight line, or the differences and changes in tangents are regular, or the set of oriented cells (0°-360°) is explored or exhausted (totally and equally if the stimulus followed through is a circle).



The cells synapsed by clusters of different (eg) "simple cells" (depending on the heterogeneity of the dispersion) would thus be in the position of receiving form-characteristic spectra of repeated wavefronts. It is rather interesting that "complex cells" represent moving lines.

Now one effect of the regenerative or spatial-frequencial duplication seen in Fig. "A" is that the pattern is much more clearly presented to the tissue than would be the case with a single representation (a unique square).



Another effect (Fig. 4, "a"-"d") is that the form of the figure is patently rendered independent of size. Of course the sides of the figure (or tangents) do not necessarily agree in phase or wavelength with the endogenous or exogenous spatial-frequencial fronts of the tissue; conceivably the phase differences at one or both sides are approximated to the nearest crest/trough, tho these differences might actually serve finer measure or a differentiative spectrum; but the involved duplication need not be consequential in view of the basic simplicity, the multitude of representations, &c. For normal shapes, phase differences of this kind will actually be standard, ie the duplication will be standard.

Now (Fig. 5) cells (microcircuitry) may 'tune' themselves around (like cellular parasites) the spatial-frequential microfigures. This microfigural unit (actually any great circle of a microsphere: note that the activity of the tissue, the spread of pulses, &c may be trifluent, triunal, or trispacial) may provide the basis for the semitopologic "densiform analysis" that I have

suggested for simple, complex, complete, incomplete, explicit, implicit, total, partial, &rc forms (and the basis for finding and analyzing "turning", eg due to the duplicate representation). It may be the turning and not the closure which is most critical.

12) There as into han that is I HT population of significant like bequeries for synchronously; thou is to chy (hongin diffuse classes; ) - the six of information cells may trad to had one author out of the synchronously, in which case as spectral frequented is to important a various is and obtain, 3 could possibly the probably the chance arranges, a means) perty above apple would be

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There is the question why the brain, if it does spatial-frequencial analysis, should have and whether it does have a single main frequency (about which superharmonics and subharmonics (subharmonics, obiter, may serve analysis of visual details (curves or bodies) smaller than the spatial-frequential wavelength) center). The utility of this to our scheme is obvious. The single frequency may be the EEG (esp its alpha component) and the idea may be that cells tend to fire with a uniquely average rate of spread of pulses (or 3-dimensional spacing of pulses). In this sense it is obvious why the frequency and coherence of the EEG can be so important in brain phenomena, eg alertness, learning, memory, processing, perception, &c. It is interesting to speculate whether cytoarchitectonic phylogeny has tended to mask concurrent improvements in relative firing of cells for the sake of regulable coherence, natural coherence, complementary cell groups, sharply antisynchronous groups, synchrony for all or subgroups, some independence or dependence of cells, some circuitry deviating from the larger EEG eg autonomous and intrusable, a random continuum or suitable curvature of firings of dispersed or clustered cells, specific coherence and frequency relationships between different areas and regions of the brain, &c.

Now it is obvious that a spatial-frequential scheme can average over small, scattered, complex, multitudinous, &c details and produce spectra, and average over these spectra in densiform analyses (perhaps producing recognitions of the "uniqueness, specificity, complex relationships, and measured relationships" of scenic detail without consciousness either of this or of the why and wherefore of this differentiation, so that overgreat complexity may produce a kind of organic unconscious in the working mind), in the retrieval of "textures" of scenes with enormous ease. (almost as if the "microfigures" where turned backwards and used as

different details).

The spatial-frequencial duplication of a figure or the figure's rendering into microfigures serves to enormously accentuate the difference of a line and figural

contour from, and its superiority over, a "solid" planum:

Conceivably the phasal discrepancy apparent in Fig. 4f, and the regularity of size of these microfigures, could account for Hubel and Wiesel's "hypercomplex I" cell, where there would be unitary surround inhibition. Conceivably, in this same Fig. 4f, the independence of noncontinuous sides could account for Hubel and Wiesel

"hypercomplex II" corner cell.

It may also be, in Fig. 5, that the area of each microfigure (its center or "lens is a zone wherein all points are brought to some degree into agreement by the spread reciprocity, double reciprocity, reciprocal contingency, saturation, "explosive multiplication", internal coherence and equivalence, enclosure, &c of the pulses or electrotonuses, &c of the tissue, either more or less instantaneously or over a unit of time compatible with the velocity of perception (perhaps as later components of evoked potential oscillations); it is interesting to speculate that this microfigura area might be a cortic column (tho these are oblong, their oblongness might be excused because of the vertical and antihorizontal arrangement of the intracolumnar fibers and cells (eg the glial insulation, too)) and indeed some measurements point here. If so, the tissue's reaction to a stimulus could eventually be reduced to a "resonant spectrum" identical within and similar between microfigures. In any event the coexistence (to some degree, and in some way) of imnumerable and complex microfigures within the microfigural space (the spatial-frequencial 'sphere') could give intense analytic functions to the complex microcircuitry of this sphere (eg intracolumnar circuitry).

Among many mechanisms serving such purposes, one can imagine that large figures produce contributions to microfigures that are depressed in a regular continuum with respect to and bipolar with the littler figures (which would be accentuated locally) so that, by merely adequate displacement or the like, figures of large size would effectively vanish at the small scale and thus figures of unequal size could

noninterferentially coexist.

number of points of intensity

(a) helponidate of points of the point

These groupings may be used for progressive (∞) analysis (complex differentiation) between all objects.

This spectrum may represent the resonant spectrum of the tissue, column, nidulus, <u>cell</u>, &rc (in time) and may be held in different yet correlated forms by different tissues, columns, niduli, <u>cells</u>, &rc. The important poin is that it is aspatial and synthetic.

"densiform analysis":

(FIGURE 13) Or Fourier analysis of.

Note that the analysis of this spectrum may be done at all different levels (eg spectrum of horizontal minits, spectra thereof, spectra of vertical units (see Fig. 14), spectra of horizontal-vertical correlations, spectra of select vertical &r horizontal frequencies, spectra and spectra of spectra of spectra of envelopes, spectra of characteristic waveshapes, spectra of (qualitative &r quantitative) groupings therein, many many spectra of random samples (eg hierarchic), spectra of progressive correlation (exploration), spectra of least or greatest wavelengths, spectra of contiguous or local modulations, (or spectra thereof), spectra of derivatives, spectra of greatest difference, &c). In this way (multi) dimensionality will be retrieved, yet uniclassificatorily (gonohomically).

uniclassificatorily (gonohomically).

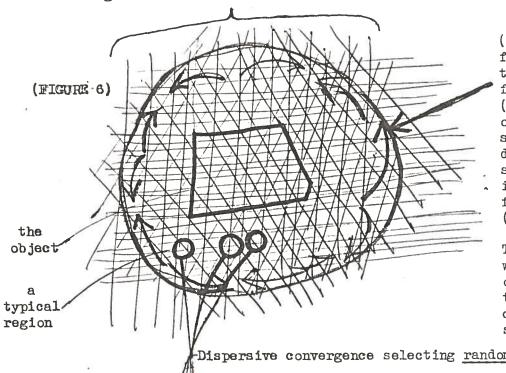
The spectra presented above in Figs

The spectra presented above in Figs. 12-14 and in the discussion can be held differentiated &r undifferentiated, serially &r parallelly, and singly &r multiply in various dependent &r independent formulas in the tissues, columns, niduli, cells, &rc, and in any of these there can be an indefinite number of simultaneous &r successive spectra standing for various figures (eg varying degrees of fusion might characterize the spectra of different figures). It may be speculated on the wing that the size of the occipital cortex, eg, is greatly exaggerated because eg of transmissive distortions blurring the content of the reductive spectra, so that eg the cortex might be diminished in neuronal population one hundred thousand times and still function as well as it does in ourselves were the distortion eliminated. This would suggest, in itself, that the whole brain of man could function with but a hundred thousand cells. In terms of the above, intracolumnar machinery could function as a sortative decision tree.

To the question of what mental capacities first or higher 'orders' of the spectra suggested, by way of example, in the penultimate paragraph would be up to or natural for, I have no answer, but this superbly exemplifies my point that the specific, total, integral, and inseperable hierarchy of analyticosynthetic operations that the brain relies on in the general, particular, and individual cases is probably too intricate, vast, and personal to be readily or eventually charted or summarized by ourselves. The ultimate test will be the working and power of devices set up on mimetic principles or axiomatically. These devices will speak (and argue) for themselves.

The chief importance of the above spectra is that they allow simple differentiatio of visual experience comparable to that illustrable in audition: the visual world is reducible to a simple continuum. Moreover, the problems peculiar to vision are all the larger problems that come to mind when considering the other systems of the brain so that the solution is transitive.

The average over all this (all these asymmetric modules) would be extremely regular, for the asymmetries are regular.



(There may be a tendency for a closural envelope to form around such a figure or object ("enclosure"). On the other hand, at (graded or sharp) boundaries of different textures the spectra may tend to interfere and close off from one another ("involution").)

This could tell the basic waveform (shape) of the object; eyemotions could tell whether there is figur closure and serve the later static recognition of closu

Dispersive convergence selecting random modules?

(FIGURE ?

Three excitory-focal points contributing to area 18 niduli so that "densiform" spectra specific for forms would arise in 18 (to grasp, you scatter points over Fig. 6).

Note number, length, distance, angle, and intersection of elements average as specific and holistically characteristic (for any figure). Area 18 may thus somehow extract regular spectra from these converges modules.

points are scattered over identical modules

FIGURE 8)

ie

(FIGURE 9)

degree of focal excitation (varying between points and thus points of "scatter")

(FIGURE 10)

This population of alternative points in a microfigural field can yield the spectrum of point strengths.

(FIGURE 11)

Here are the possible point strengths for Fig. 10. (See other possible

and concurrent representations for own but additional spectra).

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The plethora of lines and isofrequential points contained in microfigural zonules under stimulation by scenes of ordinary complexity (ordinary vision) may reasonably be irrelevant rather than posing the difficulties one might have supposed, for the reason that activities of recognitive spectra may coexist without interference and even completely independently, save for consequential interactions of compresent stimuli. For one thing, it is reasonable that the densities recording the information (as above suggested) may have already differentiated on the basis of contextual experience and experience of independent hierarchic levels; this is quite apart from the possibility of voluntary manipulation or development of the spectral criteria (mechanisms for which may be provided). One might suggest the idea of "bottom seperation" whereby spectra would naturally go to the independent recording of the detail of all experience, a 'bottom', before or apart from any other, more synthetic and contextual, organization of information; the idea is persuasive of its actuality.

It is timely to point out that "temporal consignification" should apply to vision so that precisely or approximately simultaneous information should independently or dependently associate "bottom" spectra patterns (momentary, episodic, and continuous organization of memory), ie the spectra will be cross-spectralized into realms of objective clustering, concretes, associations, implications, processes, 'wholes', 'whole events', instantially, or however you will. Further, objects are themselves abstract and incomplete so that multidimensional summation of particular situations will occur in a presumable spectrum; the alternative assemblages of situations (unique interpretations are impossible: certain parts exclude others and wholes which may yet imply the parts, and certain wholes exclude others which may yet be similar or exclude parts, yet wholes may confer advantages commanding their arbitrary selection despite their component or total ambiguity; at all hierarchic levels there may be inconsistencies with other levels that prevent, indeed render foolish, unique perspectives) should be active at some cellular level; there can be an advantage in adopting one, albeit arbitrary, interpretation of a situation inasmuch as detailed intercorrelation between it and experience may then occur that would have much greater depth than were the ambiguity, rapidest alternation, and fragmentation preserved or the rule.

amount of cells of cells

In Fig. 15 it is shown that another spectrum (open to highly complex—multispectral—analysis) can analyze the relative and absolute degree to which various orientations are present in microfigural zonules (see Figs. 7 & 8); further, it should be easy for a tissue to evolve a spectrum of deviations of angles

with respect to each other with a powerful densiformity; if microfigures were regular (see Fig. 8; which could easily represent 'finality') and with the lines 'thrown to the side' or phasally equalized (as in Fig. 4; 'which could also represent 'finality') advantageous spectra could be extracted, eg the 'sides' could isochronously or concentrically radiate to the zomular center and the intense and convergent activity of this universal point or focus could birth a powerful resonant spectrum. The spectrum in Fig. 15 could easily draw on Hubel and Wiesel's oriented, eg "simple", cells, eg using analytic spectra based on distributions of the densities or the dense seperation of peaks in Fig. 15.

largest, plainest, most numerous, most associable, most familiar, are microfigurally duplicated features could fade quickest or be depressed most, and could provide in this way momentary or ontogenic temporal scales or rankings usable in their own, if correlable, spectra (eg in this way eg features could be ranked per relative importance



(FIGURE 17)



It is now necessary to think of mechanisms serving (eg Fourier) analysis of time relations in order to produce a spectrum of resonances or frequencies that is aspatial. In the column one could imagine that unique resonances or frequencies belong to unique distances and that the spread of pulses from a point could set up unique resonances proper to each distance that would continue resounding long enough that the microfigural spectrum would fill with the proper collection of resonances and hence acquire and use the proper frequency spectrum. (The special cytoarchitectectonic phylogenies of koniocortic area 17 could easily be interpreted as ones serving simple or complex resonance, for such purposes.) It is worth pointing out that if a bunch of 'tunes' (all representing the same microfigure but with different beginnings &r different arrangements) converged (eg interareally, intercolumnarly, intracolumnarly, &rc) the tissue converged upon could acquire the unique basic tune in its resonant spectrum(s(um)). Thus eg interareal dispersions may actually serve the retrieval of temporal spectra summarizing and universalizing form (actually one could call these tatemporal spectra'). It is easy to design complementary and naturalistic microcircuitry. Re Figs. 16 and 17, one imagines the possibility and importance of various 'higher' spectra thereof.

The pattern shown in Fig. "3A" could easily be produced by a dispersion of fibers from area 17 to area 18 combined with correlation with the EEG's regularity in 17 or 17 & 18, which would give a spatial-frequencial average-phasal unit in

18 recovering the diffracted but multiplied forms.

The loss of the theta rhythm in man's hippocampus (formerly an asymmetric relationship of the hippocampus and septum?) could mean (because of Fourier EEC intercorrelative analysis after interareal(interregional) dispersion—eg hypothesized as the basis of interareal correlation and coordination) less, even radically less, entrainment of the neocortex by subcortic emotional processes (do subcortic EECs—and their thoughtless coherence correlations—decrease toward man; does their reflection—responsivity, pacemaking, coherence, reciprocity—of cortic, eg neocortic, EECs become increasingly profound and heteronomous?). There are other fascinating Fourier possibilities apparent in the phylogenic relationships of the neocortex to the hippocampus and subcortices, so explore them.

Of course the septal-hippocampal theta might formerly have served as a block for neocortic output down through the hippocampus to the subcortices so that emotional excitement would be self-limiting, or would delay and extend cortic

activity, would be measured, &rc.

(Chiter, the spectra discussed in this paper, in particular on page 6, are likewise applicable to the analysis of pulses and EEGs and their histograms; it remains to be seen what type, kind, and value of information would be recoverable thus.)

The consequence of this paper is that you have a figure present in the same zonule regardless of position and you furthermore have the figure reduced to lines (for these correspond to the spatial-frequencies) whose number and whose set of orientations remains the same in each zonule so that many things may be done, eg take the spectrum of the total set of relative angular differences (invariant for a structure of a figure) universally characteristic for that figure. Now it is possible to think of various integrals or dimensional spectra combining variations in length for given orientations, particular intensive angular differences or groups-analyses of such angles, &c in a general spectrum universal between different intensive integrals in the same of

number of angles angle degrees, angle degrees, integral histograms

(FIGURE 18)

angle degrees, angle degrees,

angle length 0

(FIGURE 20) angle degrees

number of angles

(This diagram is just

matrix

Each of the 3 axes desirable by a whole set of spectra presumably all each itself reducible to an n-axial matrix with mid-points and typical descriptions ie 'averages' ie 'cove as shown here.

Various random or irregular samples ma

be taken over matrix to find striking

Eg you may crudely have a summary analysis of the disturbance present as a sum or product (or as all the possible integrals, eg—tho not necessarily—summed or summed between all figures) to give a unique spectrum whose structure obviously or subtly distinguishes between and interranks all forms (eg as clusters down a single dimension).

concentricities of microcircles (crudely: time X distance) (ie values of summed-ring radii)
microcircles in zonule (see Fig. 10)

(FIGURE 21)

intensity (FIGURE radial distance)

(FIGURE 23) [In [In [Set of radial spectra for all] microcircles]

(FIGURE 24 [In [Set of radial spectrum therefor]

(FIGURE 25) [In [In [Set of radial spectrum therefor]

(FIGURE 26] [In [In [Set of radial spectrum therefor]

(FIGURE 27) [In [In [Set of radial spectrum therefor]

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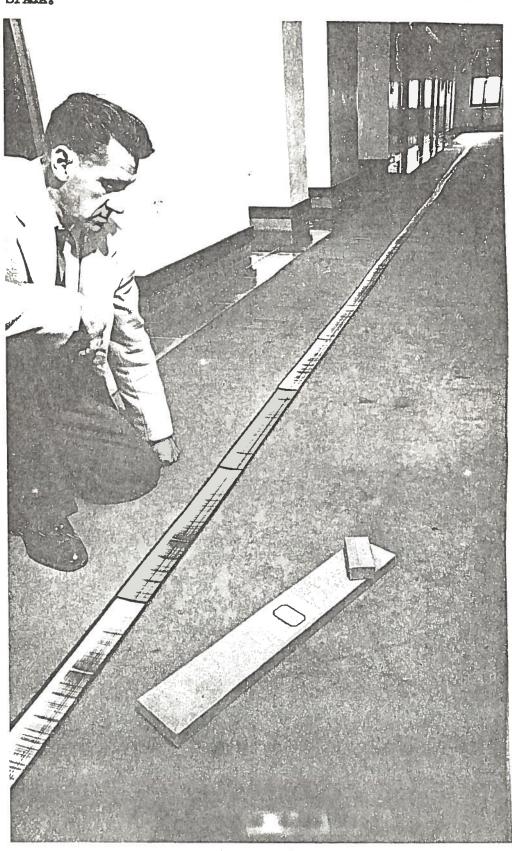
Also a spectrum (instead of Fig. 12 for Fig. 11) for distance of isotones (simple or sample-complex). Also the phase structure (for Fig. 9) (may but needn't be spectralized) may be used to spectrally (eg parallelly) seperate or integrate in abstractive spectra such as isotone-distance, isotone-number, &c.

The function of "condivergence", meanwhile, is to record and at once seperate range and dimensionality in experience so as to allow optimal progression along direct and indirect spectra both quantitatively and qualitatively. In other words, it should shift and empower invariants. There remains of course the problem of why certain invariants should be chosed and why invariance should only go sofar in various species (why doesn't a certain tissue extract all the universals to solve all the problems of the world)? The reason for this may easily lie in different capacity of evoked potentials in different species. It is easy to imagine that in different species the tissue just doesn't have the power, and it is easy to suggest changes giving tissue such power (suggest all these things).

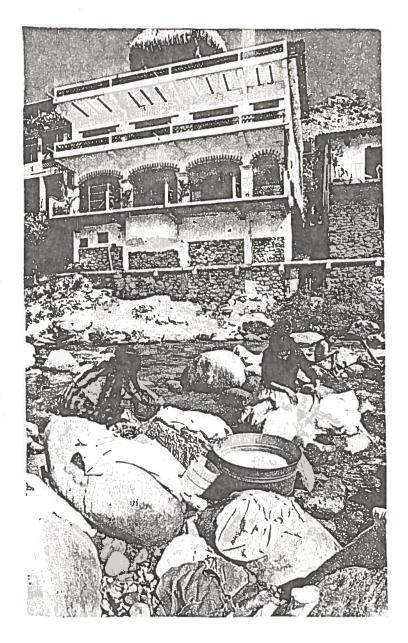
On the other hand, it ought to be obvious that if a figure occurs over and over again in a mosaic of microfigures or zonules, "duplication", the tissue should find it remarkably easy to establish correspondence-showing spectra for the rhythmic activity in each module based on the intermodular duplication and regularity of the rhythmic activity. In fact, simple arborization of interareal fibers should do this by emitting duplicate radial concentricities at each point of scatter or corresponding to each point of regularity in the figure, so that the figure will be automatically centered, say as the identical time relations for activity around each point. It is apparent that even in the crudest sense this intersective activity will recover the spatial-frequencial structure, turning,

microstructure, &rc.

SPECTRA AND THE WORLD THEY DESCRIBE AND QUITE COMPLICATED: YET THE BRAIN IS ABLE TO INSTANTANEOUSLY SPREAD ITS IMPRESSIONS, THE FIRST AND THE LAST, OVER THE ENTIRETY OF SUCH SPECTRA, IN ASTRONOMIC HIERARCHIES; YET THESE ENORMOUS SPECTRA ARE SELF-DESCRIPTIVE, ESSENTIALLY WATERFALLS FROM SINGLE POINTS.
WHEN THE DETAIL OF DESCRIPTION CETS SUFFICIENTLY DETAILED IT DESCRIBES ITSELF; THUS HIGHLY COMPLICATED SCENES ARE 'FOUND' IN MEMORY DESPITE DISPLACEMENT IN VISUAL SPACE.



THE SUN'S STORY is told in a strip of photographs which make up one complete spectrum over 40 feet long. Each picture, here being studied by solar expert Robert S. Richardson, covers a portion of the spectrum, spread wide to show minute detail.



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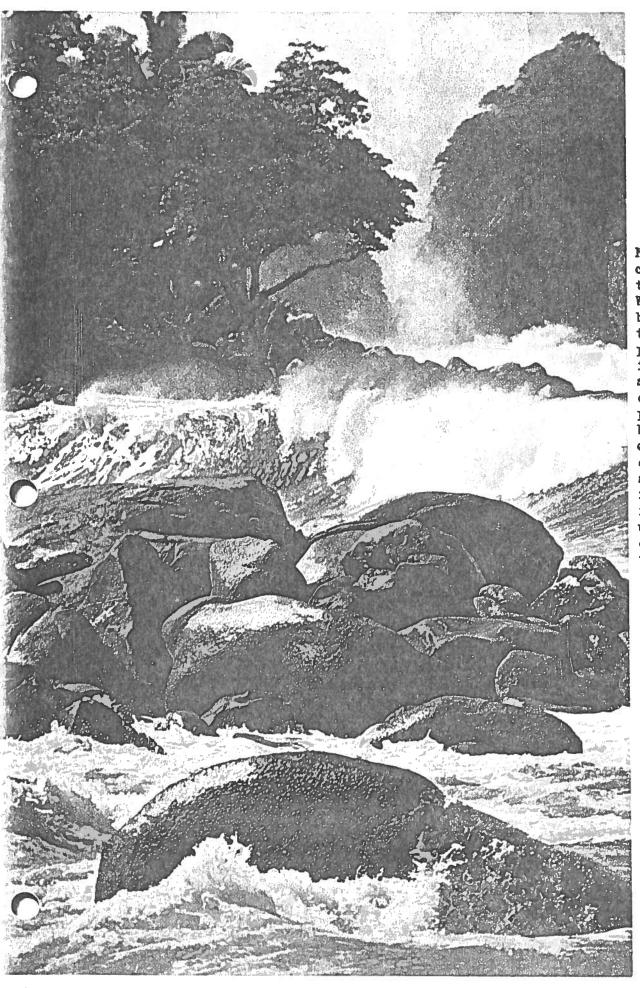
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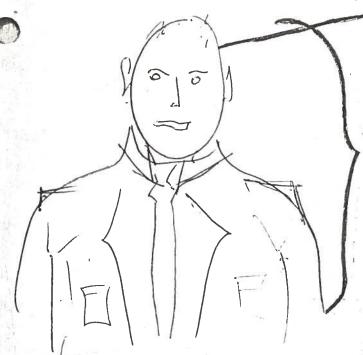
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Now what is most characteristic of this scene? Whatever, it must be supposed to ri to the surface fo purpose of identification, a shortcut to all other detailous processes that ca be imagined. The combinatory force of just a few simple comparison is easy to see, 1 is it hard to understand an ontogeny of such things.

## A PICTURE MAY BE HEARD AND THUS SUNG BY A POINT Pat Gunkel



A curve like this can easily show up as a characteristic assortment of interfrequencial relations on a spectrum (an aspatial spectrum, too, because of the universal irradiation).

Head-pocket distance = long wavelength (all waves, regardless of frequency, contribute to modulation of all other waves). Small features at one end of the distance (eyes &c). The relative position of things is accounted for by the set of wavelengths describing all the features so that subwavelengths corresponding to dispositional asymmetries are available and complete. As well, conceivably phasal fractions or asymmetries can be taken from the larger features-wavelengths. What does all this give? It gives a set of wavelengths at one (and every) point adequately (especially since these points may then be superadded and averaged at the next cortic level) characterizing the structure of this scene (intrastructurally relatively or as intrastructural modules) and

in such fashion that multitudes of scenes are similarly reducible on this spectrum. It may be added that to varying degrees the irradiation may stay proper to finite distances or on unequal distance gradients emphasizing locale, say simultaneous with reduced but usable irradiation to all distances. Of course, certain fiber patterns might even favor certain distal correlations.

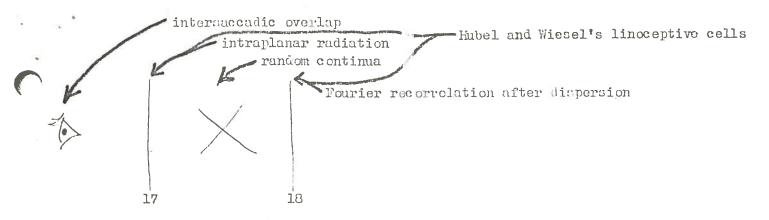
Now I have already shown why one need not worry about intrascenic orientation. External orientation (such as right and left, up and down), however, is easily accounted for by the continuous heavy bombardment specifically differentiating such different external orientations. Moreover, the typical orientation in which scenes or parts thereof occur to the eye and the axes of the cortex must be signifigant and contribute no special problem in adding a sign or a preferential spectral submodulation to other information.

Now returning to how a spectrum of relative structure is producible, a simple way would be through the various distances acting as superharmonics &r subharmonics of each other or everything serving to create coexistent harmonics, eg the least frequency could be repeatedly compounded by the largest frequency or selection could occur from all the harmonics of the most-probable subject at hand. There are obviously different prominences in any scene sufficiently typical and finite that they could serve competitive selection and thence universal selection. Perhaps the most probable is a competition of all harmonics.

An interareal dispersion could indeed quite easily take the harmonic spectra at a first area representing local structure or structure about a point and gracefully emphasize larger or distal structure, using these same harmonic spectra, at a second or higher area by the seperation of the projections. There is also that detail which is signifigant only over distances, not locally, that would gain through "emphatic" dispersion.

Now it is worth pointing out that the "scatters" are capable of taking an n-dimensional or idiomorphic continuum of an aspatial Fourier spectrum or a structural universe quite capable of breaking down this spectrum into sets of frequencies corresponding to characteristic, ranked, and complex objects, so that the two ideas are potentially complementary. Just as the scatters are potentially capable of "pulling out" the spatial Fourier frequencies without irradiation.

(1) ( a weal should's has been previously symbolis en (17), 175 all showl just be lies allow all the described It revisings coments in are length, was despite of the changes - lever . But why in oriented lines to the intent there is heterogeneity. All a point in the 10 km in would monerto experience, are longe at Figer orientation job actually arent? columns ( consumoling to least points or quested thetal grand beautical as should shou A prefer lives it i profer loci it i perifer cried trins, divided before t collemns, be fler areas, of (8) should the control of the states and there are there as the are the properties, who the we know as rolling love of the control of the interlimitation of lines (who has a proper oriented on the interlimitation of lines (who has a proper or white just as the control of the properties of the proper her. according as there is (local's distral) variety would in oris well concerning. The wills in asystes with lines same solido ("homogonistica"). On the other land, the engreeneng I love cells hard could come a course the absonce of lines in intersors of Liques to be that more estricting or to be regularly significant. And indeed, concurrently printing no b. actions could at border surrounds, & interior tylus could accomment in injustance to legative activity of special there give my warms for why they may be along purps, to charles. (2) Laire an amind in which in hob. For all or intersecurs in L 6" inero. selectively destroyed recommendated (say by chronis change of tous) across development to see how at last cell jumporties in a 17.



Two things that Hubel and Wiesel's line cells might do are (1) extrapolate beyond boundaries as straight lines and (2) extrapolate between parallel displacements since these stimuli (3: extrapolated line, parallels, and extrapolated parallels) would typically occur in experience so these cells with similar properties would tend to group together (by connection or irradiation). Increase of these cells, their powers, their connections, are might thus enhance these perceptive generalizations. Another thing they might do is fill spectra of orientations that could give the local structural spectra, in a hierarchy that could eventually encompass structure at largest size, for fullest scene, &c. It is apparent that a continuum could exist so that textural spectra could be kept proper to each successive level of size and distance in the sense of maintaining multilevel contrast maximizing positional and sizal complexity of unitary figures. It each point would surmarize the density and structure of turning by differentiation in its spectrum of spectra of:

intensity
density
number
(eg number
of cells of
a particular

orientation)

degrees of turning spectra thereof, &c

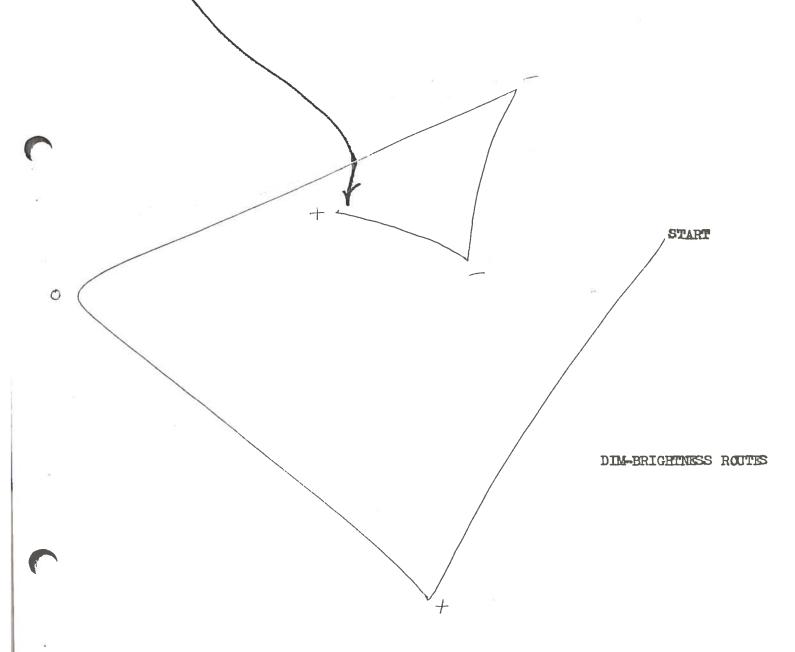
Now if all the line-orientations in area 17 are forming a spectrum in 18, rotation is irrelevant because the "interfrequencial structure" of the spectrum would remain the same, and size is irrelevant because the frequency spectrum would remain the same despite amplitudinal changes. Now multiplicity of forms is alright (if each different) because each of these would have a distinct figure and still alright if each the same because a certain scenic variety could intrude proportionately as each point in the cortex involved different intensity of particular spectra due to distance and because extrapolatory and parallel sets could form as differentiative ("interstructural") subspectra between different figures or their spectra. Position is otherwise irrelevant because orientational spectra would be scattered irrelevantly over distance to produce the generalizing spectra. Finally, averages could be removed as this total activity converged, eg interareally.

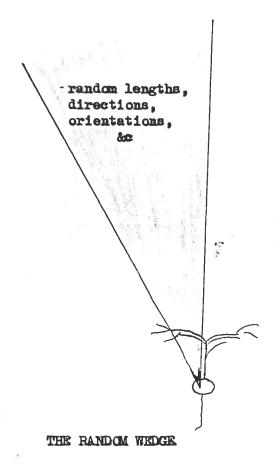
Set-spectra of orientations could form subsets based on length (and perhaps intrafield inhibition over progressive sizes) at all sizes of length in a continuum to the largest length and largest size of preferential object-to-be-texturally rendered. Note that the spectra at each level would actually give the relative structure (by a spectrum of intraspectral differences). Too, at levels of small lengths the analysis would be pluralistic, favoring <u>local</u> details. Since based on the intraspectral structure, the different levels and regions would be directly intertranslatable.

## A NEW THEORY FOR VISION Pat Gunkel

The set of all possible movements (past moments) randomly distribute over a picture—creates a "random hierarchy" at all levels leading to passive recognition by the cells of spectra of collections of points quasirandomly chosen in the past as productive reducers of a scene by discrete fluxes (ie that progress in complexity in a gradual way by the systematics of possible-series elimination).

Relative recurrence to a point on path. This recurrence causes absolutization so previous transitions are then matrically compared and adjusted over the intermediate value—this process proceeds with all absolute and relative recurrences and the result is a continuous spectrum of coordinated state transitions. These recurrent adjustments enable the selection of proper scale and forms, and all this occurs passively due to the abundance of past moves and "scores". In this way a scene is analyzed by numberless transition criteria acting passively on integral spectra(um).





Observe that by random sampling of continua contrastic successions are experienced and learnt by neurons, peculiar successions that generate what I have called a "random hierarchy". Concerns of cells become a universe of combinations of maximally intercontrasting samples, an incisive wedge in each cell's activity, as opposed to those dull continuously graded things that might otherwise happen. familiar random-hierarchic successions are made the preference of each cell of the tissue, or at least its phase states, and the cumulative ensemble becomes an odd thing-a massive random hierarchy operating in parallel to effect dense analysis even, eventually, in the absence of movement. Ie each cell at each site would automatically look for values (eg +1, 0, -1) over a path and would sample the available pattern in terms of these transformations. .

It should be possible to take geocamptic combinations or elements that emerge in this way and "explore" them, they to be called "random slices". This exploration proceeding in the extraordinary way of being simultaneously random and organized, the organization being entered hierarchically over the randomness. It is conceivable that this could create an extraordinary pattern of attention similar to one level of consciousness as we know it. The

most amazing thing here would seem to be the arboreal formation, say based on discrete comparisons, through horizontal anastomoses (random slices), of a reasonable being.

It is possible to scale up properly the angular and distal units of distribution (for successive space-time fixation points) because a <u>contimum</u> can be "tensed" to create easy (trans-scalar) equilibrium between large and small, proper "exploration" with corrective future-guiding feedback can occur (eg by 'extremal' randomization to find slope and hence plain of dullness or novelty-maximum (internal maximal continuum), &r the "golden random hierarchy" can be applied or at work.

Note that if the whole eye (of many receptors and cortic parallel spectra"parallel operators") moves the particular saltation applies to all the parallel
operators, eg in the sense of semirandomness correlable with oculomotor patterns.
The alternative would be to have all the parallel operators randomly uncorrelated.
Note the same 2 possibilities, as apply parallelly, apply serially: successive
points could be semirandom or purely random. Explore these 4 alternatives. (Note
eg that 'jumps' of a 'certain' frequency(ies) &r structure(s) could be simultaneousl
expressed or performed sans disturbance of the other randomness (or nonrandomness)
of the jumps—or particularly in longterm oscillations giving a periodic or nonperio
(is there any such thing?) pattern that is extremely easy to detect and hence to is about in the regime of jumps.)

One thing that one can do is use random-continual (which, note, may have, qua 'random', an ideal density double-curve or clustering or "golden hierarchy of asymmetry" pattern (genetically?)) representative configurations in order to have simultaneous contrast (and abundantly!), where the groups of points would be regularly (learnedly?) or randomly processed into each other as a discrete-dichotomic spectrum. Obviously (because discrete-dichotomic and 'polyvariable' (superposable spectra)) the generated spectrum for each "scatter" could unite in following synaptic superspectrum &r superspectra. It would be the entire rhythmic activity of the tissue that would be embedded in this discrete-dichotomic probabilistic spectrum.

The use of a discrete-dichotomic hierarchy drops out what is random and leaves what is ordered.

The function of the progressive phylogenic complexity of the nervous system might actually be to increase the randomness (eg type of) because in this way the form of the world would be better seen as diverging from it.

(1) The "golden hierarchy of asymmetries" can be modified so as to or might naturally and essentially include references to extreme sizes or some sort of 'infinity' ("rays"), with unknown effect and usefulness.

(2) In addition to '+/-' (discrete-dichotomy) one could have trichotomous (especially +1, 0, -1), polychotomous, continuous (for uses golden hierarchy of asymmetry?), or 'continua of variety' correlations (eg for between neurons, eg bineuronal cross-familiarization by the latter "variety"). Now, in the other direction, one can imagine 2 atoms in reciprocal resonance such that they would only naturally be responding to and computing discrete-dichotomic changes in relationship, or fulfilling oscillations (the solution to the many-body problem?) corresponding to this. Various vertical or superposed hierarchies of matter and systems computing discrete dichotomies can be imagined. All one needs to do the discrete-dichotomic analysis is to have a norm or average handy and an anharmonic (external or internal) recurrence.

(3) Possibly great music (or art) is what fulfills in some way the "golden hierarchy(ies) of asymmetry"—and in proportion to its fulfillment. Of course this definition might be limited to (one type of) creative art. Art could, of course, also be just a compact ordering of the materials of the mind, or an ordering such as to convey (superimpose) gesture, as the rhythmic gesture in handwriting mirroring personality and meaning (in other words, pattern is

very specific for different types of things).

Now it is worth theorizing that mechanisms in the human brain (eg or qua "pit-climbing", perception-as-action-as-perception) specifically serve the growth, intensification, and in assertion in man (v animals) of a maximal number, diversification, good ordering, integration, and "noocosmic cyclodromy" expression, and the mind's "arachnoidy" might specifically be of the kind where this is done or has been achieved (eg the basal ganglia could serve this in a fine sense, by the active expression (of cyclodromes eg) could serve the whittling of these patterns into a usable hierarchic form). It would also be interesting to apply discrete-dichotomic analysis or scheme to synecdochic possibilities and variety (eg if the part and whole exceed one another on certain values or do so serially).

(4) Now one can apply discrete-dichotomic probabilistic spectralization to every neuron of a tissue (eg area 4) so as to distribute the cospectral analysis over all the tissue and retrieve all the continua (idiomorphically). You can see that this method is distinguished by turning qualitative into probabilistic analysis and producing a 'flat hierarchy' noted by its real and potential polydimensionality or specific retrieval of degrees of freedom. Now evidently it would be extremely easy to condition this treatment of the information, for eg conditioned might be n-dimensional and themselves-idiomorphic "slices" of possibilities and possibilities having assertive contours atop as between things joined by slices or specifically as those wholes or aspects of the wholes which are retrieved as functionable and functionally tailored n-dimensional sets or "equilibria".

(5) A lot of my recent thought has been on how orders propagate so that they saturate, eg via 'explosion'. A precedent stage of thought would be on how orders interconnect.

(6) Problems that may yet arise:

1. No good at the "12 visual problems": requires special programming.

2. Fallacy of reasoning.

3. Problem with so-called 'random' distributions.

4. Incapacities of computer size, ontogenic rate, efficacy of small number of "ocelli", need for a degree of cross-connectivity approaching the brain's, &c. 5. Active sensory, passive sensory, motor, cognitive, 'emotional', or other problems: need to approach intricacy of design of human brain and impotence of a system stripped of this.

6. Couldn't a whole discrete-dichotomic spectrum belong to anything else? Are there lots of multiple wholes? Is there good seperation between different

wholes?

- 7. Why hasn't it happened sooner in biota?
- (7) Easy to test on any computer. Take specially-random groups of points of successive pictures and read in a suitable series of point value sign (+/-) changes; use parallel point divided spectra so as to predict some detail of the scene. Is the question, then, + or - for assigned points as 'first values' of cumulated point spectra for parallel operators, the resultant point series being point-probabilistically fused and spectralized at the hierarchic superspectrum? (Re foregoing: improve, may be wrong.) Does the density of the space-time points have to approach ours if comparable detail, per se, is to be recognized? Note that our brain can't or doesn't recognize a picture if the parts are scrambled; but the program might be able to and, in addition, the brain may have hypsicentric random continua depositing an overwhelming superable or insuperable bias spectrum, but such could be mimiced in the machine. Note that the discrete-dichotomic decisions are enabled to explore any contrasts (eg gapped and incontinuous and heterorandomly (ie artificially with respect to the variety in the external world) selected continua) and any continua (eg hue, saturation, brilliance, focus, instant of spread, instant of processing, instant of spread interaction).

AMAN Values forming here may be taken into each other for degree of difference corresponding to given form in relation to past forms experienced, and eg a correspondent density spectrum may be formed that, as such, can be intensificatively and amplificatively added to other spectra to create a superspect: of final correlation and seperation of that level of discrete-dichotomic branching whereat the signifigant heterogeneities and homogeneities of experiences or forms appear—note it is specifically order independent of size, form (since disperses form criteria), time (hence jumping between scenes), &c. Evidently—eg just throug spectral analyses—there are many ways for doing this, possibly independent, dependent, additive, multiplicative, perfective, insubtractable, &c.

(9) Note that the discrete-dichotomic method would seem to give a method independent

of size a la the "random hierarchy" (~ "random incisive wedge").

DISCRETE-DICHOTOMIC PURE TREE

(10) If randomization in the case of vision 'is' produced via random-hierarchic jumps, how 'is' or might it be produced in the instances of somesthesia, audition, action, emotion (here it may be produced through the agency of random but large and regular (and thus random!) limbic blocs), &c? How important are methods of randomization in evolution? Task: distinguish between structural and functional (actual and all possible) mechanisms of randomization.

(11) How un/necessary are various and all modificative methods (eg "tensed gradient

of randomness")?

(12) Note that the randomizations need not be dynamic but may be static, eg spatial fixed random-continual interareal scatters in the case of audition, and the discrete-dichotomic randomization still (more, same, or less?) have tremendous power (13) Is there a reason for creating multiple levels (eg of distance-size) eg in the visual system obeyed curve-frequencially by random point groupings as opposed to a merely random or merely random-curved system (but, note, just approaches clusteral hierarchy idea)?

(14) Note that the deviance from randomness caused by "exploration" may actually be the very method for finding and using randomness or greatest randomness, even for the varied (the convergent) world.

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importance, type periphery)

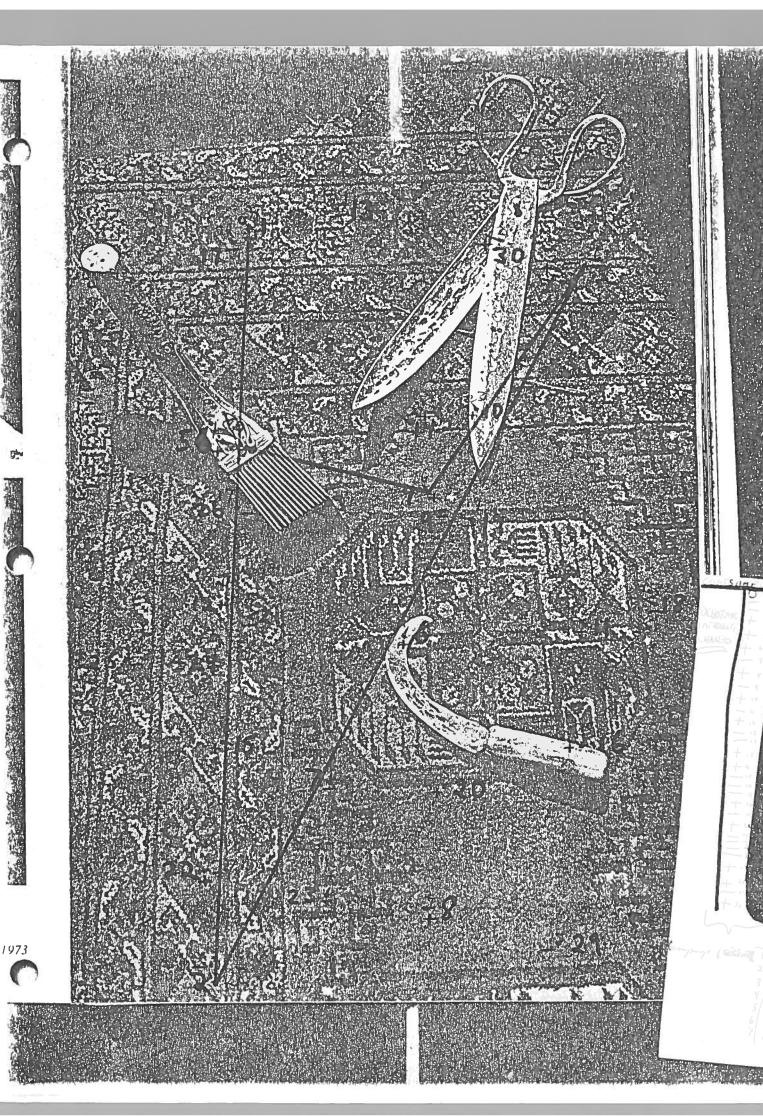
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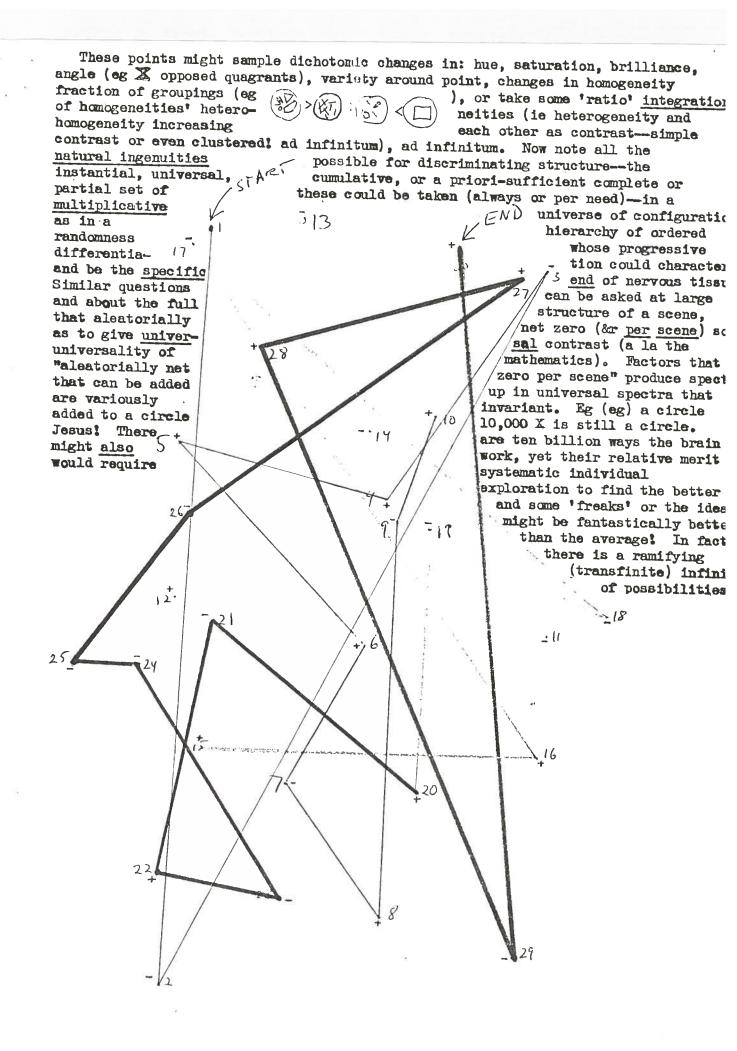
willtrarandomized points in space, time, function, and other qualities, perhaps genetically weighted, able to "explore", to explore without losing randomness, &c; eg E. V. Evarts pre-start and pre-stop cells could be related to the gamma motor system, but in any case serve reticular distribution of point-density for emphasis of signifigant events (eg changes and pattern-at-change).

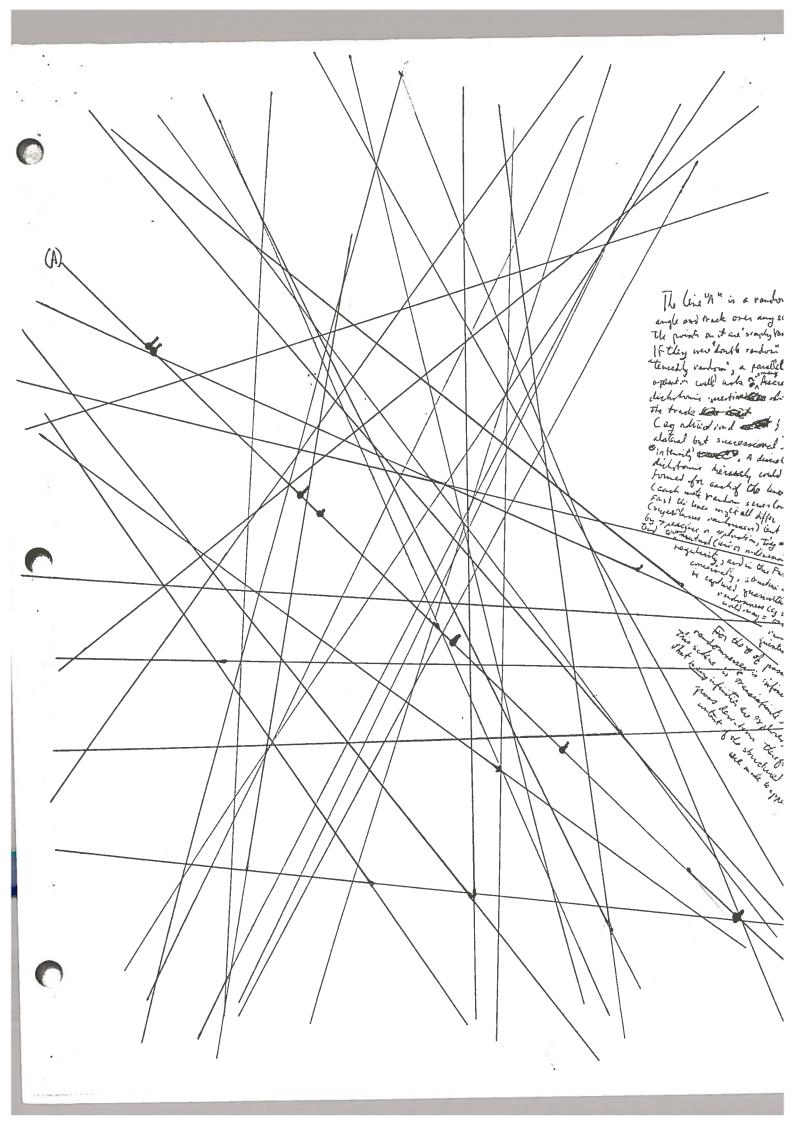
(16) On the computer's rate of development: I think an ordinary modern computer can be programmed in no time at all, and would grow up in from less than an hour to 2 years time. This is just 4 orders of magnitude difference. 20 years would be just 1 order of magnitude difference. Both the reception or interaction with educational material, the rate of internal thought processes, and their unique power through discrete processes and other nonbiological advantages, cause me to think the computer would either undergo maturation in a tiny or arbitrarily small interval, or not at all for practical purposes, since greatly exceeding the human lifetime: intermediate anthropomorphic values would be an improbable coincidence. It is unclear what resultime direct interaction with men, if any, would be essential or relevant.

The level of human intelligence having been reached, it would rapidly be exceeded: the intelligence, and the calculation, would explode. (17) If my theory is correct, perhaps it should be possible to take bitonic or polytonic values corresponding to variously random intensity instant-point-events from a picture and put these on a "fusive" tachistoscope as a series of changes in spatially-featureless luminance of a screen (if bitonal, make contrast marked since artificial; if polytonal, then is naturalistic) and the temporal-serial process should allow surprising recognition (eg 50 frames per second for .1, .2, .5, 1, 5, 10, and 60 seconds-and to see progressive detail or complexity of scene recognizable; use both for task-limited (eg "Distinguish 12 faces!") and random memories (eg picture of childhood home, random acquaintance, &c)). Now, due to progressive selection that may occur naturally, eye scan fixation points in an actua eyeball examination of a picture might be substituted for the artificially random set of points. It is obvious that after a very few discrete-dichotomic point-events nonrandom selection would become signifigant or ideal in the dichotomic serial or parallel combinations. Note that after a number of tones or polytones the most probable object would pop up, not the determinate object, so that the very first dichotomic 'decision' does theoretically specify a most probable object (most frequent in all or recent experience, most contextual, re?). Note that these "precocious" most probable pop-up objects combine to give fantastic simplification (by redintegrative shortcuts, ie "complicated prediction")! Another thing it might be possible to do is take the average intensity values for whole areas (eg "g-areas" ie "half the picture").

(18) Because the successive random instant-point-events give the relative hierarchic (contrastic) sizes of areas (from dichotomic intervalues), the picture gradually forms between the random moves by the intersections of a powerful cross-associative matrix.







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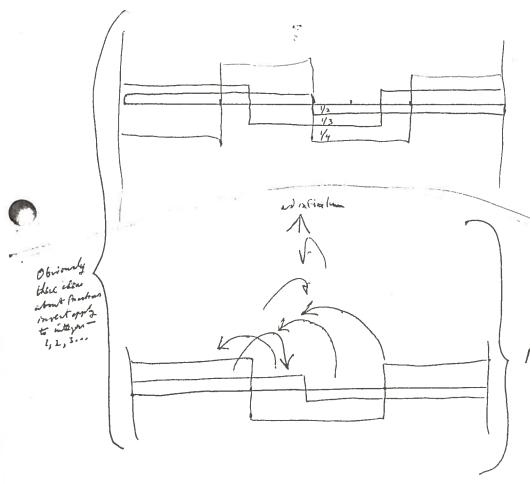
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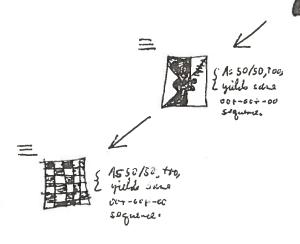
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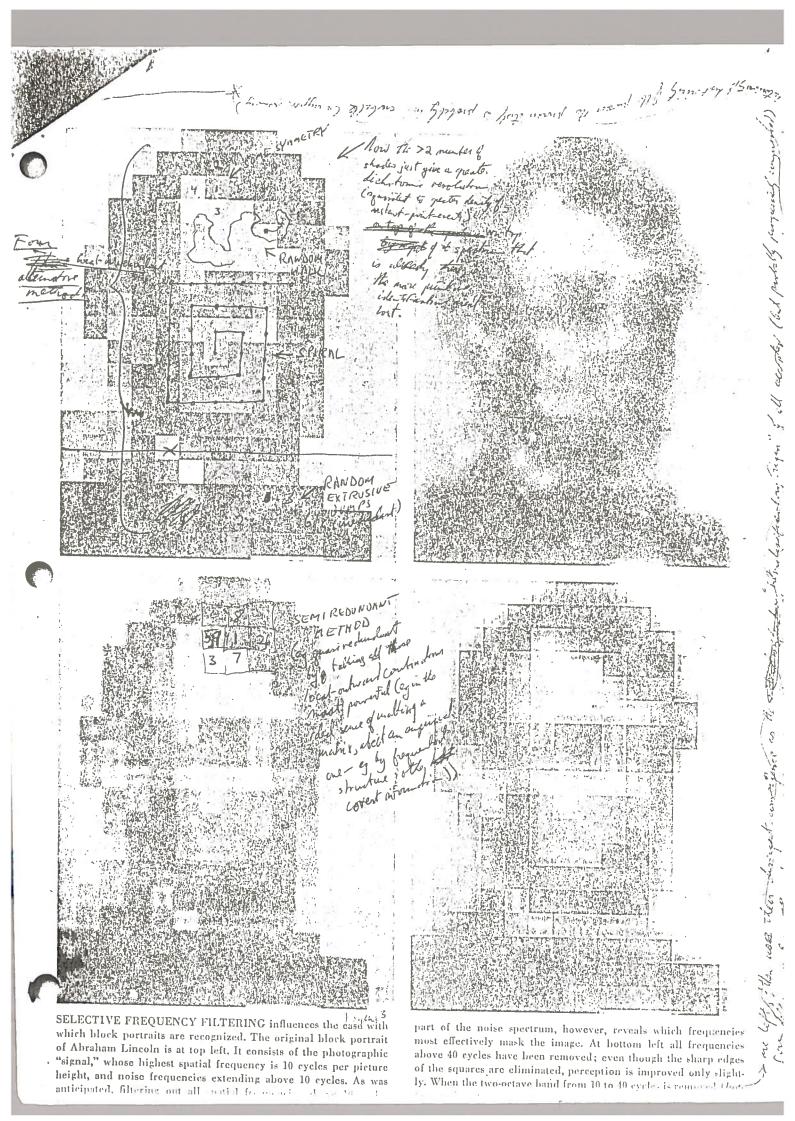
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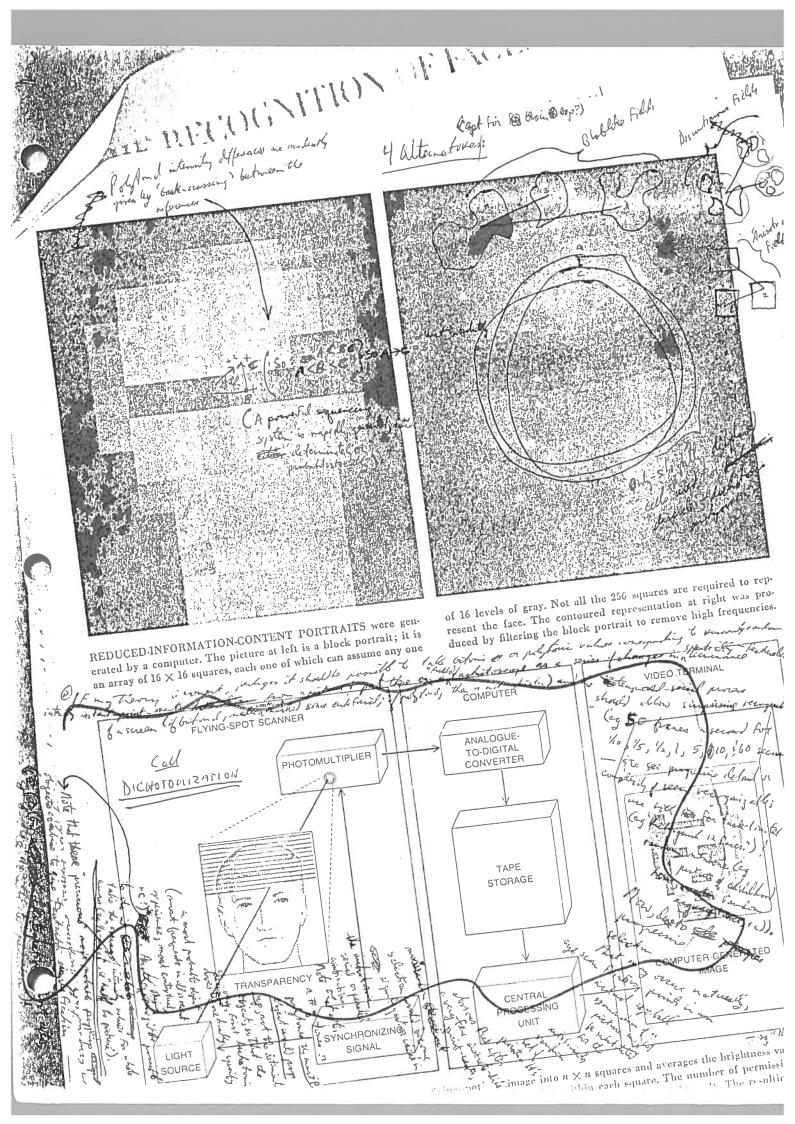
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World this be necessary to give recognition? Dishat about installing intentioned loops in the system to give miltiple values For Vone , 51ze, 5 interrelation , +c? and the ideal set cought set (An EEG type thing, 29 )

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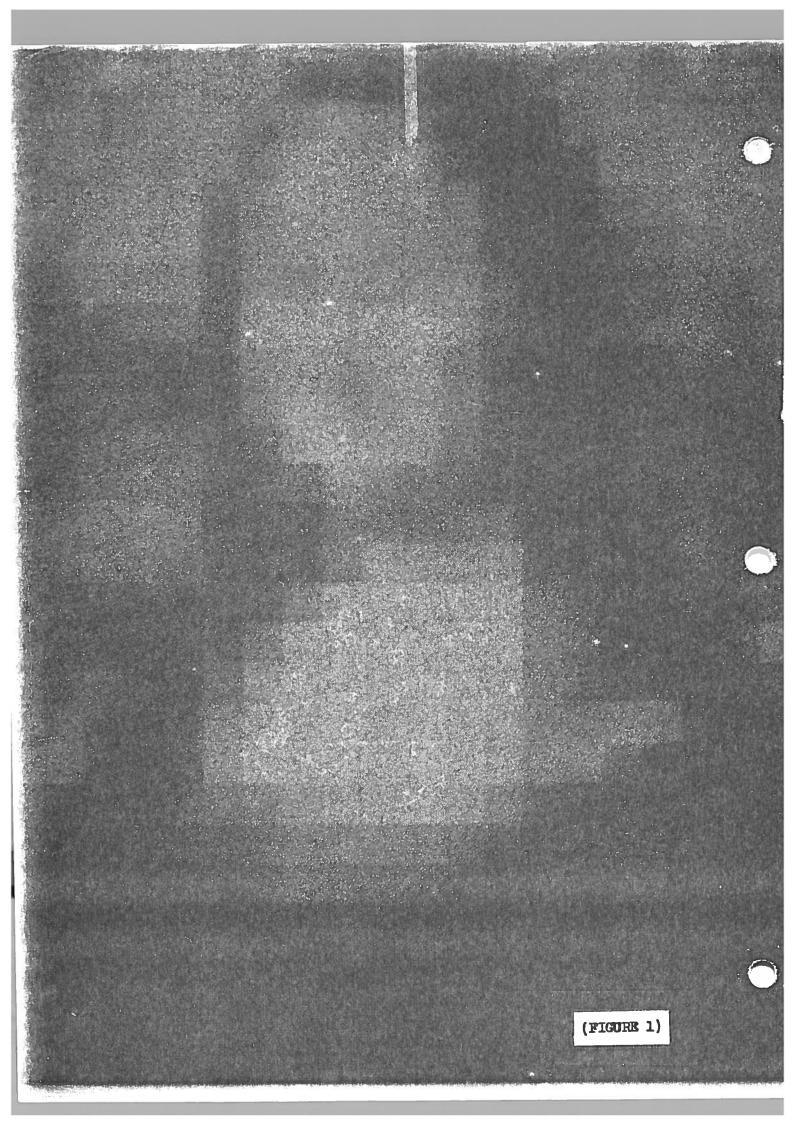
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### ON VISION Pat Gunkel

The recognition or information here (Figs. 1 and 2) is actually much greater than it seems because the abnormal modules are misleading (they may summate to give a distracting bump to the brain's spectra), as shown by defocusing the image. Further, I think one might see similar detail tachistoscopically, as if the high frequencies were added and effected holistic interference subsequently? One might thus theorize that the brain works down from largest (simplest) images or percepts to smallest (most detailed &r complex) and consciousness can get buried by late integration so that consciousness 'is' a time-mean or time-blur. So subconscious recognition might be vastly greater and cleverer than that known and 'figuring', in one sense, consciously.

The trouble here (in these pictures) is that the modules are integrators with highly specific, albeit internally uniform, values\* so more information is available than first seems to obtain. Yet this may tell us something about the brain since eg my idea of a Bubel and Wiesel cell hierarchy with wide-areal spectra sufficing for form recognition is analogous! Perhaps these (and blurred)

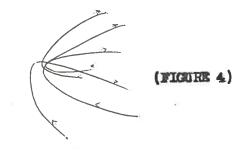
pictures take us closer to the spectra used by the brain.

(\*). This may be the best argument I know that the brain uses highly specific analogue spectra or continua whose specific interrelated values are extraordinarily complex and multidimensional. Like a matrix, 'cells' (modules) may turn into adjacent cells in an analogue-branching pattern that, before it has gone far ('revolved much') will have formed a gigantic decision tree and a specific decision. Yet the number of decisions to specify (recognize) a thing may be extremely few! Eg, one can just go over 4 adjacent squares (corresponding to an adequately complex-specific background) and the analogue-spectralized background -part of the scene (eg the part or kind of an object) may then be spectrally compared over all the parts or detail of such and all (interdescriptive) objects used by the brain to give that spectral seperation necessary to identify this (background-unique) unique object. Presumably one could use triangular modules but, unbelievably, perhaps one could just use dyads or monads (since the synthetic or integrative mixtures of things in the world is extraordinarily stepped (discrete--analogous to using just +1, 0, and -1 in trichotomous analysis of neuronal histograms, cf. "Higher-order Patterns of Neuronal Interspike Intervals (Trigrams and Quadgrams) Analyzed as Self-adjusting Sets of Ratios" by C. J. Sherry and T. J. Marczynski in The International Journal of Neuroscience V 5, #4 (1973)) or dimensional ("dimensionally 'hollow'") - one would of course be dealing with the probability, but this could be adequate, inasmuch as the supposedly disruptive (to our idea) gradients of the world are pseudocontinuous .

Now this may serve to illustrate why and how analogue representations and values are used by the brain. Referring to the pictures, the analogue values of each module may be extraordinarily specific both as incidental continua and as discrete hierarchies (anastomotic trees: "nets") so that the background detail suggested ("screaned") by each module may be evernore complex (as the the focus on a picture were increasing or a scene was filling in progressively more detail at every point): thus the 'modules' of the brain (be they columns, cells, synapses, molecues, &r continuous) may, through their 'incidental and discrete' analogue values, but in terms of their extraordinary complexity-specificity, embody the full detail of sensory and mental experience (since it is not lost through the myriomodular matrix of the tissue) in analogue ranges that intercorrelate between all cells as "subfunctional entireties". Furthermore, note how cognitive ontogeny may go on in an analogue-parallel fashion through the eg-binary interactions of all informed events (whose summations might be carried by analogue-"finary" (= finite:ary as in binary) pulses. It is interesting that these modules pictured resemble the artists, Cubists and Modrian. Such art may thus be, properly, not "abstract" but "transformed

The brain captures "essential asymmetries".

(See asterisk in Fig. 3) even more so (for it, too, is specific) if the frequencial transitions are included ("refocusing")—eg note the obedient contour lines. On the other hand, the brain may take higher frequencies first and gradually blur these cut til the last (lowest-frequencial) 'images' are left, and then use their divergent-convergence as the "intraclassificatory origin" of all accepted (but probably progressively compressed) form differences. Since we're speaking of the brain, this refers to a functional origin, functional terms, and purely functional differences and difficulties. Because of the ambivalence, interiority, and historicity of the process the process itself is probably indescribable (a cryptic memory). The only important thing is that all things may dip into the mysterious origin so as to partake of holy communion or homocusian transformation (disidentification with capture of least attributes: punctuation); Fig. 4.



#### RE THE INFEROTEMPORAL NEURONS OF CHARLES G. GROSS

- 1. Specific extremely-complex or naturalistic objects. Crucial features unknown!
- 2. The universe of objects apparently gradiently ranked (at least to some degree-in a case where infinitesimal but minor, and holistically combinable, and progressively complex or multidimensional, subtleties of unique objects, sets of objects, or an essentially object-free convergence statistical or quasistatistical behavior of the cell may figure in identification) about preferential or preferentially-identified objects.
- 3. Indifference to slit length for many cells.
- 4. Usual orientations of preferred naturalistic objects critical (eg little response to hand pointing down v up or sideways).
- 5. Some cells most reactive to 3-dimensional objects in the plane of the tangent screen than to any stimulus projected on screen, including 2-dimensional representations of the former; both monocularly and binocularly.
- 6. Some clustering (eg 2-5 cells) at depth-path electrodal nearness.
- 7. Few cells respond identically with one another to a range of stimuli; the responses to certain stimuli common, most cells seemingly have own preference spectra.
- 8. Save one cell, optimum stimulus for a cell optimum throughout the receptive field, even if bilateral.
- 9. Virtually all cells respond best or only to moving stimuli (both TE and CA).
- 10. If orientation-selective, optimum orientation almost always orthogonal to motion. (Eg 3 cells preferring handlike stimuli indifferent to fingers orientat
- 11. Some cells either bidirection or unidirection-sensitive.
- 12. Far more OA cells (83%) than TE (48%) direction-sensitive.
- 13. 2 of direction-sensitives in CA but 85% in TE bidirection-sensitive.
- 14. (Given ## 9 and 12 it follows that a large percentage (25-50%) of TE cells respond to any direction of movement, in many cases movement is a sine qua non.
- 15. Directional sensitivity same everywhere in receptive field, save for one cell.
- 16. Most cells' direction-sensitivity independent of contrast.
- 17. Since at least 3 cells (1% of 253) prefer handlike stimuli: a. some objects are are shared by populations of of the order of 3,000,000 neurons (it may be, depends on clustering) instead of 1, b. an object hierarchy (eg based on familiarity or importance) with an (exclusively or not) sharp top is implied, and c. some complex idea of the preference and operation of these cells and this tissue and the cortex is given (eg a monkeyhand is familiar, executive, receptive, motor, investigatory, communicative, social, emotional, personal, coordinative, trans-ontogenic, serves comparative measurement, involves great yet systemic dynamic transformations, &c; similarly a tree is personal, impersonal, motor, sensorimotor-coordinative, implies a special system of motions and perceptions (eg ocular distance), suggests (in these laboratory monkeys) old memory, suggests freedom or escape, is an environmental marker, involves its own (eg slow) time relations, is vertical, is handlike (confer children's drawing), suggests a haptic texture, suggests specific motivatedbehavior patterns (eg fright, hunger, curiosity, aggression), involves great (good) class-variety, uniquely implies a color (vegetal green), &c).
- 18. That 2 cells preferred movement of a slit parallel to its long axis suggests a tissual complement to the previously abundant orthogonally-responsive cells, and may uniquely distinguish this from previous cortices.
- 19. That I cell fired best to a moving vertical slit independent of its direction of movement suggests a gravistatic (vestibular), self-, head-, or horizon-rectangular coordination, the emergence of a visual field-independent environme percept and concept, the bias of overall familiarity (at last in the cortex), & Too, greater object-invariance is suggested, perhaps the abstract idea of movem and evidently the apprehensibility of complex movements or movements inter se. On the other hand, conceivably this vertical preference would change as the hear moved. Here we may have the intertransformation of movements. This also implies a directionless analysis of the feature space (eg unifying lower abstractions).

20. In 2 cells the preferred direction of movement was different and it was mirror-symmetric along the vertical meridian; the receptive-field location and the response properties were similar in the two eyes. Suggests, in a neat fashion, divergent movement, as in perspectival change during anteroposterior motion.

21. Some cells respond sharply or only to red or blue or green stimuli and not to the others or to white; luminance-independent; much more frequent in TE than OA. (Are there cells responsive to more intermediate or combinatory, even highly specific (eg familiar) colors, or what is the minimal bandwidth of any cell (less than the pigments'?)? Are there cells responsive to specific transitions? Are there only-white cells? Are there cells responding to specific chromo-textural relationships? Are these preferences innate or learnt? Do they change with time? Do they correlate with other properties? Do cells responding to trees prefer green trees or generalize to some degree for green objects?)

22. Most cells decline in response when stimulated at less than 5 second intervals. Response strength maintained by intervallic increase. Cells requiring more than 15 seconds for optimum response commoner in TE than OA.

23. A few TE cells' response will decline in the course of a sweep across their microfield at the standard (5-70/sec) rate. Reintroduction of the stimulus after a few seconds anywhere in the field enjoys again the response.

24. Eye dominance: 4 ipsilateral, 4 contralateral, and 5 bilateral. The bilateral

fields and their responses were identical.

- 25. For almost all cells, response strength and EEG covaries: vigorous response during fast EEG and little or no response during slow. In some cells the pattern of spontaneous activity covaries with EEG frequency, in others, only changes in evoked activity covaries with EEG. Novel sonic, visual, or somesthetic stimuli can effect this transition by effecting arousal; in fast EEG, cells go unaltered. (Novel somesthetic or sonic stimuli are also often required for full visual response of area 17 and 18 cells in anesthetized cat.)
- 26. Some cells respond to specific and complex dark (shadowform) shapes but not to dark slits or dark rectangles of similar overall dimensions; TH more than CA. 40% of the dark-responsive cells optimal for rectangular stimuli, smaller ones usually are better as stimuli; for the other 60%, particular complex dark stimuli optimal. (Commonest dark stimuli used by Gross were a variety of of rectangles or slits with widths of .25-30° and lengths of 1-70°, and hand shadows.)
- 27. At least three TE cells preferred complex colored patterns (eg photographs of faces or trees; crucial features undetermined).

28. For most neurons, a light slit 10 wide better than another size.

29. Stimuli sofar tried arbitrary and half-irrelevant for monkey: the larger and more specific pattern is inapparent.

30. A few TE cells prefer a 30 diameter circle or a 50 x 50 square to the 10 slit

most cella prefer.

31. 10° x 5° and 5° x 5° checkerboards are good stimuli for several units (exact field boundary determination difficult). (These could imply textures of whole and be quite different from each other; even, cell preferences for specific complex complex figures could be analogous to or identical with such 'textures'.

32. 48% of the cells respond to both dark and light stimuli (OA and TE proportion similar); whether responding to dark, light, or both seems uncorrelated with other properties. 71% responded to light and 69% to dark stimuli.

- 33. That #9 is true implies that these cells and these tissues respond selectively to and capture scenic changes? In turn implies most processing occurs for changes? If more motor and attentional changes occur in man than animals has this the corollary that more processing occurs in man and, conversely, that control over these changes could magnify processing enormously? Is it implied that an adhesive or snapshot memory is the brain's here? On the other hand, is there an implication that motor processes are enabled in this way to radically subjugate perception to their purposes, eg through dictating transformative arousal?
- 34. Contralateral responses often greater than ipsilateral but converse rare.
- 35. The center of gaze or fowea falls within or on the border of every cell.
- 36. Many receptive fields extend well across the midline to the ipsilateral 2-field (unlike the geniculostriate system) and some are even ipsilaterally confined.
  56% TE cells and 30% OA cells have bilateral microfields (minimum 30/each side).
  Of unilaterals, 57% of OA cells and 20% of TE are ipsilateral. (Thus TE is essentially fusive?) For OA and TE both, bilateral microfields centers are mainly (79%) contralateral. (But note not all of OA and TE explored.)
- 37. Receptive fields surprisingly large (median and interquartiles):

  TR 14100-4090-1450 >> OA 1400-690-140 (whereas in circumstriate and striate many <10); the fields average is probably even higher.
- 38. No cells respond to somic or somesthetic stimuli, per se.
- 39. With standard background illumination, all cells encountered by Gross were spontaneously active with almost all 1-30/sec.
- 40. (Re #39) activity of 86% OA cells and 82% TE cells altered by visual stimulation most exclusively by increased firing (72% TE, 62% OA), but 20% TE cells and 12% OA cells decreased firing only, so that 8% of TE cells and 26% of OA cells either increased or decreased firing over spontaneous levels depending on the retinal locus, movement direction, &c. Implies?
- 41. A small set of cells decreases firing with particular stimuli for which no stimuli increasing firing have been found. (2 such have been found in cat strig
- 42. Most cells were similar to superocollicular cells, both some were more like occipital cells. (Tolerance of consideration variation in stimulus shape and movement direction without altering response characterizes supercollicular cells
- 43. Inferotemporal cortex projects superocolliculus (from posterior part only), amygdala (from anterior part only), pulvinar (more anterior and lateral to that part of the pulvinar—the posterior inferior—projecting the same cortex), the caudate tail, and the ventral putamen in the monkey.
- 44. Inferotemporal stimulation depresses striate excitability (recovery cycles of evoked responses to paired light flashes).
- 45. Inferotemporal lesion in monkey leaves unaltered minimum seperable visual acuit; the visual fields, critical flicker frequency, threshold for detection of a bri flash, and backward masking, but deficits hue, brightness, 2-dimensional patter 3-dimensional objects, retention of presurgic visual discriminations, postsurgi visual acquisitions, learning of individual visual problems, rate of improvemen of performance on successive visual problems—permanently but not absolutely (ie depends on discriminatory difficulty since a visual requiring 30 trials in normals will be learned by ablates in a similar number, but problems requiring 200-300 trials in normals usually aren't learnt after 1000 or more trials).

### INTENSITY FUNCTION VALUES Pat Gunkel



(1) A form appears here on the tissue.

It has a certain "intensity function value".

Next, the same form appears over here. Its intensity value is a function of the previous value throughout the tissue (proportionality of the integral; this may form a unique spectrum as subharmonics, superharmonics, or as phase values, or nonlinearly as relative frequencial or—better—resonant (since distributed) values of the celled tissue). In any event, its real value in the tissue will be a function of the previous event.

Next, the same form appears over here. The position may be taken, at each site, as a function of the previous value, "2", which is a function of the more previous value, "1". Yet the locus is intermediate. Thus "3" is a function of "2", "1", "2" ~ "1", the new site: yet the 2 dimensions of space are now triangulative exhausted. Thus the universal spectrum with its new intensity function ceases to have to generate new spatial dimensions.



If the form is rotated about itself a new intensity function is obviously created by the degrees of congruence and spatial attenuation (also temporal attenuation, ps, because duration and instantaneity have a metric).

(5) The intensity function may represent the massive interrelative turning down and up of the activity of cells, or some such simplism.

(6) The changes represented by 'movements' from  $1 \rightarrow 2 \rightarrow 3$  may or may not form a closed ( $\forall$  open) spectrum or, better, "spectral stream" (since integrated, continuous, noninterferrent—or since an integral but recursive divisor of the previous 'number') over the spectrum.

(7) Since we are talking about "spectral streams", an intersemidependent typology will arise in the progressive unitary spectrum of intensity functions and, in effect, invariance will develop to various categories of hierarchic stimulus change—angle difference, motion difference, locus difference, form difference, size difference, hue-brightness-saturation difference, &c.

(8) The intensity values may have various degrees of spatial unification over the tissue and visual space accordingly as they have opportunity for transmissive unification. Whatever the case, intensity function spectra with their spectral streams should easily be able to cope with it.

(9) The unitary intensity function value may be directly analogous to the phasal value of the EEG, tho a, tho polar, harmonic hierarchy value of the EEG (ie the value would be spread over the EEG as recurrent "density" values as a quasirandom yet quasiclustered yet informationally clustered series of series (of series, ad infinitum) over average peak and dominant-rhythm (a continuum only showing its nose as the alpha, &c rhythms and as 'gross' activity)).

್ಯಕ್ಷ 16 ಎಂದು ಆರ್ಗ್ ಅನ್ನ ಅನ್ನಾಯಕ್ಷಕ್ಕೆ ಕಾಲ್ಕಟ್ಟು ಕರ್ಷಕ್ಟ್ ಕರ್ಮಿಕ್ ಕ್ರಿಕ್ Some RANDOMIZATION SCHEMES ELIV : Landwill For Street Town is not be a property of section) for more — . ded—no relations of extending a relation of the order of extending a relation of the order of the order of the order of the order of the order of the order of the order of the order order. (1) ್ಯಾರ್ಯ ನ ಕಂಗ (700) ಕಿನಿಕೆಗಳ ಕರ್ಣ ಕರ್ಣಾಗಿ ಇದರ ಸರ್ಕಾರ ಕರ್ಷಕರ್ ಕರ್ನಾಗಿ ಕ್ರಾನೆಸ್ ಸೈ / the state of the road growth and the state of the state o thin thin the rune great rate the, were Viewitalin of the man seems in the Cart webstelled and and \_ randon iggent a den (arte viviscalar): 11 the state of the s The state of the s . [g/::-randon appropriatore unhapoter of ( note versicales) I will of previous point - in a six of the expension of the term of the second of the . prince for a second of the second of the contract formed of the first transfer to the former of the former transfer to the first transfer to the first transfer to the former transfer trans the state of the second i random avoidant Filling (onto murrales is terrible) 2 1 2 1 3 7 2 1 616 mal, transford-intentrical, the test asymptotic, worgan town, that presentation Spedial arvidance filling rict oile The The control of the co and to For Large a winds data medical casis of millustrate er per file i destination for ha did entre de autopolitication file en la president de entre file. Send avidance or tilling to the sent of th or dearly be Capitainett , lightnimus 112 and a second of 1 70 th and it is 1120. Commission probabilities) 1 100 1 100 12

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#### HOW A POINT, LIVING A RANDOM EXISTENCE, CAN KNOW THE WORLD Pat Gunkel

But a point mind can equal man's. Eg a one-rod eye brain. The world is formed. A point in a succession of instants (which itself may be random) ₩ 180'-360'(-) : is given a random group of points, eg over a scene, eg as differences in hue, saturation, and brilliance. In this way the point (which theoretically could be nothing but 2 physical atoms in reciprocal resonance) would be in a position to recognize all structures and dynamics (that we recognize in the world and think ourselves to talk about), for the ordered spacing of eg the size, orientation, locus, population, form, &c of form would part from the random perspective of the cell and grow into probabilistically faithful shape---the shape of the external world. Thus the brain could be a bunch of "parallel" point computers (a "galactic computer")! In the real human brain the task (of using the world as we do) could be greatly simplified by causing great numbers of these point-resonant computers to superimpose their spectra so as to produce (a) supreme density spectrum(a). Hard as it is to believe, the little adding machines (adding frequency structures, not ls; just as isentropic waves cross the sea) and a colonial mind would function quite well this way on the basis of a crude superspectrum of resonant density.

(Cb, is the difference between lower animals, man, and a random neural net one of a transcendent hurrying of an inevitable process (or are eternities transfinite, so that, eg several, have to be selected from?), or one of a bias so that columns, circuitry, cells, &c are abstractly analogous to lowor high-band pass filtering, say a removal of dense "autospectral" 'numbers'?)

The fascinating fact is that but a point can recognize angles over time on the basis of its random net ("jungle") of scans ("grazing").

A still simpler brain could be discretely dichotomous: for hue, saturation, and brilliance (note that any 2 of the abstract concepts here could easily be gotten out of one other-tho the concept would then be equivalent to any other grading, eg shading, regime, til such time as the regime consciously implicated its special implications for the external world), are successive point experiences less or greater than (- or +) the immediately preceding one; the ordering present here would then seem to allow all the knowledge and intellectual attainment of the above model.

More marvelous still, my work on cubic sets &c would seemingly suggest that this omnicompetent 'nothing mind' could be bipartite, one rod and one neuron ('resonant atom'), and unipartite, one rod-neuron (atom; its resonances would be analogue-synchronous and analogue-complex with the irrandomly impingent world) -- again subject to the above type of doubts (peculiar biases, hyperbolic or many seperate eternities). Implies hylozoism:

Apparently today's handcomputers possess cryptolarge memory capabilities (and memories!) and can be put to work becoming men! This lies in the fact that the interactions between very few components can possess arbitrarily specific and exact relationships to or with the external world: hence its missing.

"Truggent grint"

Verbally, substitute "random cage" (probabilistic coordination over all the random point combinations) for "scanpath". Solution to intrascenic problem is that time is a 'point or line' so the method can learn to look (motorally and subjectively) about (collapsed 'rounds') in a scene when any scene is presented so as to jump (random-hierarchically) to or in those configurations (progressive spatiotemporal topology) discrete-dichotomically serving the finding of "random semiextremes" in an active and growing description of the world-in other words, practise itself is extended random-hierarchically.

The size of things or of the cage-scanpath may be taken random-hierarchically so that any probabilities established would actually be only those 'distributive'

patterns able to emerge within such a "rough" experience.

Evidently reusing scanpaths closes the topology just like scene blurring,

making all points 'integrofunctional', would.

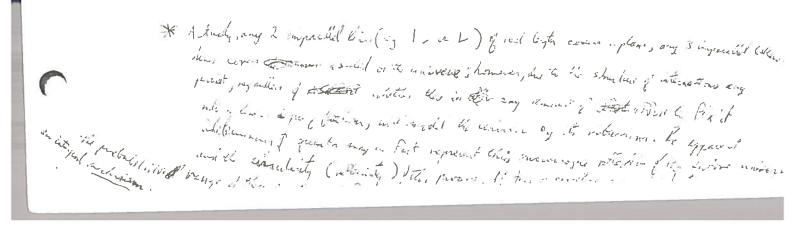
The "random cage" may be imagined as 3-dimensional and jumping through 3-dimensional space, to random points, and at random (but successive) sizes [random-hierarchically?]. Note the equivalence of internal and external randomization of the cage's points, so there is an eversive integral ("eversive random hierarchy" or-more specifically-"random-hierarchic eversion"?).

If a scene is blurred, the integration makes any triangle of coordinate analogue (intensity) values adequate to describe (know; reconstruct) the whole scene-interesting that any triangle that reproduces the scene generates a plane! For the real 3-dimensional world, any tetrahedron of points is adequate to describe (miniaturizes) the cosmos; because of the infinite extension of physical causality (eg gravity) and averaging, any tetrahedron of points actually is a miniature (intensive reemergence) of the universe. Is "size" c, light's "speed"? The propagative delay being irrelevant, any point, because of its infinitesimality, reproduces or embodies the whole (the cosmos), and all of time (which had to emerge c of 'the' point); moreover, the cosmos, embodying the whole, hence all relativities, makes 'chance' processes and indeterminacies irrelevant or impossible, for the very order for describing any such deviations is contained in, if anywhere, by definition, the whole

Thus the universe is also unextended even now, or, (eg physical) infinity is also intensive or is extensive-intensive symmetric, so that by the nirvanic quest for nothing everything may be achieved or 'at least' found. The point and whole are equal. What does this mean? Does it open the door on infinite creativity? Does it make everything ambiguous? Does it define and prove the

spiritual? Yes.

Present and past states were defined by and relative to the whole, thus there can be no true chance events. Eg if the indeterminacy supposed lies in the branchin of a particle's path or the uncertainty of exact position of a particle over a field, the different alternatives will be defined by and relative to the whole, rather than being independent. The registration of a difference in the actual course of events likewise will be defined by and relative to the whole, eliminating antecedent, presential, and postcedent true chance or indeterminacy.



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It is interesting that space is 3-dimensional but an intensive tetrahedron of 4 points adequately describes all of this, for time has been described as the 4th dimension. That space is 3-dimensional is interesting because the reciprocity of the above intension symmetrically converts 3 directions into 3 bidirectional dimensions, and one can imagine that the cosmos is expanding at its extremes, and is causally slow as, as "light's" speed for the reason that the whole is reacting to itself in a self-description that is the universe as we know it. Nothing in current physics says the cosmos, if compacted to a point, would be static or any less active than it is today. And oddly enough, the cosmos expands as a sphere such that any hemispheric events can affect one another, cannot affect any events in the other hemisphere, so that any homospheric events are interconnected yet despite this continuity of interconnections cannot affect any heterohemispheric events, &c (eg intraradial interactions eg temporal asymmetries). Because of c (finite causal velocity) any point may affect any other only after the other has changed (reciprocally and freely). Also, the cosmos just happens to be expanding so that all particles (point events) are infinitesimally seperating (as a radial sphere), which is just that infinitesimal minimum which is necessary for (reciprocal irredundancy; in other words, the change which is occurring is infinitesimal and the only representation is the relative rate of outward motion or "eversion". A sphere has the property of being equidistant from a point, the center, so that its points are equidistant from a point. The sphere is pure undifferentiated expansion (size), whose center is reached by a line (where all lines converge).

Why should gravity emerge from a collapsar? When a star reaches critical density and collapses, what is the structure of collapse (eg is the surface first?

and might c be exceeded, -- the star totally collapse instantaneously?)?

Could there be a 'cosmogony' as a Machian variant where our universe is actually implosive, a cosmic collapsar? (In fact, in a collapse where even gravity collapses might such collapsars become--infinitively ('universe' as an infinite hierarchy where 'all' there is is collapse or points at every point creating infinitely or superinfinitely numerous cosmoses?) -- new comoses because of an intensive eg-intensification of the forces so real and potential 'particles' (convoluted expression of such forces) would 'increase' to 'the number' of cur ("sufficient") universe--where our cosmos in this fashion and vice versa may be exploding 'outward' to a Schwarzschild limit (or 'sublamina') wherein a spheric 'surface' is actually a point, the point to which (or equivalently) our universe is actually imploding, say to create the distributive (or symmetrically indistinguishable) illusion of explosion -- note the consilience of this with the observation that the universe is closed so that a continuously extended straight line is a meridian that returns to its origin from the apparent antipole (and regardless of direction. in the sense that the spatial universe has no radii)).

Note that it is infinitely improbable that any particle of the universal explosion is following a perfect spheric expansion (since the number of particles is finite); since there is a dichotomic difference between a perfect spheric expansion) straight radial path) and any other path, and since curves encompass the latter, all there are are curves (it is an 'elegant' or 'judicial' idea that all the change of the cosmos since birth has consisted in curves); since only straight lines attain infinity (hyperbolas are symmetric to closing curves and parabolas are unreal (? baseball thrown at an angle above escape velocity?)), and since the only straight lines possible must be the set of cosmogonic radii (creating minimal spheric seperations), all curves and all particle lines must recurve....((develop)). Note that infinitely spreading particles oblique to cosmogonic radii must (over eternity) intersect in the sense that field capture operation should occur and the universe spherically collapse as a cusp (which passes elliptically to a sphere or approach passes elliptically to a sphere on approach or with time) (or as a hierarchy of

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spheric-cusp collapses) to a cosmotelic (cosmogonic? note the approach of the particles could throw off intensificatory interactions to revitalize the cosmos, reversing time, so as to create (be) the time and the world as we know it) point; note, too, that (no particle paths being cosmogonic radii so that all vectors are semilateral) the infinitely extended gravitational (and other?) fields are free to act in the essentially timeless space of arcs over the expansive sphere so that, over the 'eternity' of the radial expansion, lateral attraction acts to reconsolidate the cosmos. Note, too, that possibly after the expansion had gone on for some time the depth of the frontal (if such) sphere (the zone universe is distributed in-eg to create our apparently 3-dimensional space--which may eventually flatten 'elliptically' as orbits lose their circularity, contrary repulsive forces submerge or die out, or, again, lateral attractions come into play, say against a relatively 'irreducible' radial inertia) declines toward or to relative or absolute zero, relative to the diametric distance of the cosmos' figure. (It is infinitely unlikely, and thus impossible for the finite, that the particles in space are perfectly perfect-symmetrically distributed, to rule out an exceptional case. -- Of course infinities compete if contractive-expansive cycles of the cosmos are innumerable. But my writings on the inseperability of the whole and point and the intermediate supremacy of the principle of the golden It might be argued I should random hierarchy, may oust this 'ruinous' paradox.) give a little fairer treatment to hyperbolas and parabolas as possibilities. (Redshift would appear in an implosive cosmos if centripetal alacrity was centralnote there is 'no' central limit. Why is gravity strongest in a body's centerwhy symmetry cancels effects?--Does affect light? It would also appear, as we see it, if the gravitational acceleratory and hence velocital collapse were greatest peripherally: Why shouldn't acceleration (not speed--?) of a body toward us shift its emitted light to the red?

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{2002 NOTE: That discussed in this paper formed the basis For my years-later & temporal var theory of the min!" paper.

## A METHOD FOR DIVULGING THE STRUCTURE OF RECOGNITION Pat Gunkel

One takes a tachistoscope, computer with a cathode ray tube (CRT), or a movie and uses these to show a series of objects or scenes in variously randomized sequence, say at a flicker rate or a variously randomly varying rate, and observes. The things projected may be few in number, such as 2 or 3 scenes, repeated, or all different. The projection may go on for just 5 seconds or all day or for weeks. The set of things shown may or may not be chosen for types of similarity or for greatest degree or type of heterogeneity or dissimilarity. Sequence randomization may or may not be essential. Showing may be adjusted to the subject, say as to rate. Good projection material would be a set of extremely complicated natural scenes. One might specially randomize (say intrascenically) for successive location, orientation, size, distortion, obscuration, complexity, &rc. One may take the rate of presentation up to the point where successive scenes blur or fuse, in various respects at various rates. One might perform the experiment with warying luminosity between or within presentations. One might fragment the successive projectings so that fit is diachronic and like a jigsaw puzzle. The subject might be acquainted with the aim of the experiment and what to look for or at least not fail to note. One might wary the rate of presentation in a gliding way, heterometrically. Etc.

There is an analogy to the Wiener method for using white noise to retrieve cross-correlation kernels, or randomness to show form, what is in one way a perfect sampling. My method should in fact break reality or the process of perception in half so as to show the edges or its important structure, which is a structure by transformation or intertransformation. The dimensions of the world and perception should appear in native contrast for the first time. The point of the randomization of succession is to eliminate interference in seeing any such structure through the ends of analysis, as simply predictable, appearing instead. This method should help in seeing the minima and real terms of perception. The very order inherent in pictures would be used to offset the routes in between this different order, or the roots of this order. The very fast and highly complex subliminal processes that ordinarily perception, which are otherwise irretrievable, would be divulged. Something of a sense of scale would be provided for each of these. Further and supremely, the universal uninomial or n-nomial manifold out of which all possible variety and complexity of perceptions come, and wherein lies the true diversity (economic and lavish) of the external world, would be manifest in an almost tangible fashion. Conceivably a tremendous, lasting, and irreplaceable insight into all of perception and conception would be had, by the mere experience or by its early incidence in life or continuance over the lifetime; ie we would learn to see the structure of things, their relativity and generality; arguments could be made that all children should be "schooled" with the aid of this autonooscopic Its scientific exploration could constitute one of the most important experiments ever done in psychology, and the method and its results could reorient and underly all subsequent research within psychology. The method is therefore analogous to the untapped ability to learn to estimate, value, perceive, think and act in terms of relative values and patterns of probability.

For sound, it might profit to listen to 2, 3, 20, or a maximal number of simultaneous or perhaps simultaneously varying pieces of music or conversations, or to alternate and randomly alternate these in time by a complex splicing, where again the dimensions of things would be divulged.

It is conceivable that all this might lead to a theory of environment or a new concept of figure and ground. Human thought might become freer, and a new entertainment and art form found.

Xunderlie

PERCEPTION: HEARING &C

PERCEPTION: HEARING, ETC.

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#### AUDIOGNOSIA Pat Gunkel

The arrangement for maximal recognition in the case of audition might differ from vision and coenesthesia for subtle reasons (however, main or slight intracortics, intercortics, retrocortics, homunculi or secondary direct projections may in fact obtain) (the other senses, eg olfaction and gustation, will be discussed elsewhere), such as the principality of proximity and spatial linearity or the adequacy of focal spatial blending with dispersion. Thus counterrunning cochlear representations on Heschl's gyri are appropriate because cross-spectral linearity is less important than spatial linearity, relative to the value of alinearities and opposition; it is more interesting that natural sounds contain differences in frequency and frequency components and esp extremal components.

On the other hand, it can be imagined that binaural fusion would follow the primocortic area 41 advantageously because the slight interaural differences and great resemblances would initially cause confusion and the input to subsequent areas would be less useful whereas by delaying the combination monaural preceding areas could acquire definition and congruence bilaterally that would then contribute in the following areas to interaural discrimination. It could even be imagined that fusion would be postponed to a tertiary area so that a secondary area could converge frequencies, sounds, and times and increase definition for the sake of better interaural discrimination (where crude orientation might occur subcortically) or the like. But possibly the Heschl gyri are partly antilateral (whereupon the counterrun spectra could serve frequency indications of orientation).

The auditory cortex in man is drastically different than even in the chimpanzee, is obviously very complex internally and interconnectively, partly because of speech, and is poorly understood; these things are relative, of course, and basically it is quite simple. Animals with far simpler cortex have complex audition and my explanation can be major.

One can assume an occipital structure with equivalent dispersion between areas 41, 42, and 22. Thus cells in 42 will receive single or multiple acutely decussated projections from 41 cells, and by 22 any point in 41 may disynaptically hit any of area 22. The representative configurations of cells or columns in area 42 will then constitute a randomly and evenly distributed spectrum or sampling continuum of frequency patterns reproduced on area 41 from the cochlea. At this point it is instructive to look at audiospectrograms of speech and other sounds and see the 'larger figures' that these possess in contrast to noise; phonemes may be shown as obvious. Of course hearing evolves to greater subtlety; it is not clear to me to what extent larger figures are dispensable, nor how essential they are to the recognition of smaller components somehow related to their fundamental structure. Thus sounds contain obvious figures and cortic representative configurations contain, really, equally obvious figures; the range and specificity of the latter mean that the former are consistently and detailously classified and interclassified in hundreds of millions of cells and trillions of synapses. Assuming many points in area 41 converge to each niculus in 42, then, joined by the diversity of function and randomness of interareals, and given eg impulsive and synergic facilitatory incrementation, the parade of sounds (timbres varying temporally) would undergo statistical analysis and synthesis (all sounds would be compared on a complex multidimensional average whose resultant biases would virtually be the biases of experiential diversity itself, ie would be the biases of-great-specificity), so that all subsequent sounds would be classified in terms of and by their differences with previous sounds, the detailous criteria sufficing to give a simple sonic intuition of similarity, dissimilarity, and types of similarity.

It is apparent that the biases imposed on this tissue by auditory influx (immediately intercalating kinds of synchronies and esp producing kinds of synchronies by duration) would persist as synaptic resonances and join with temporal transformations of sounds so that temporal distributions would demonstrate analogous classificatory analyticosyntheses and tissual deposition, with sortation reflecting proper and comparable averages important in noogenesis, consciousness, and cognition. For example, by the process of condivergence, temporal consistency within and between sounds would undergo supplantation, classification, and hierarchicalization. is important to note that this very process of heterogenization would produce homogenization through complex and continuous interference (within the aspects and components of the sound and between sounds likewise), a process which might be called diconvergence and be important (esp if conditioning the fate of large masses of information, enabling condivergence, capable of spontaneous regeneration, of application; or of selection for generalization); this is related to the idea of the multiplication and migration of engrams or properties.

There are two possibilities of continual interest in the brain related to the phenomenon of facilitation of memorization by prior memory, the relative important of which is uncertain. A few powerful stereotypic memories can serve as a classificatory calculus for further memorizations, or on the other hand, all memories or the very density of memory may interclassify further memories. Excellent and systematic examples of this principle are linquistic: letters organize syllables organize words organize sentences organize books, organize everything, or the matric alphabet organizes everything. This is related to another important uncertainty, the role of decision-trees in mind.

The linearity of the frequency spectra in area 41 and of visual space in area 17, given their regular hypsicentric dispersion to subsequent areas, are important in intensive or continual analysis. Each sound becomes its own ideal with every other sound related continually thereto. Each part of visual space is its own ideal and continually interrelated with others, size may be analyzed, &c.

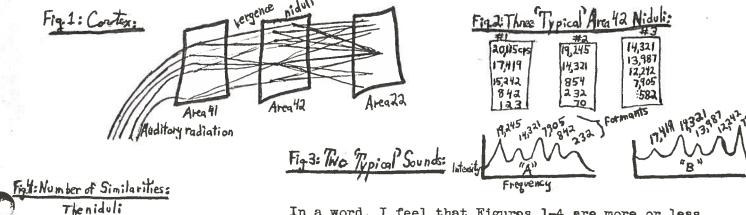
The ideas of engrammization enunciated here accept that concurrent tissual events will have consignificant representations, and the total activity of tissue over time interrelate the contemporary events; that the greatest identity with a moment of time will be an adjacent moment, that themes transit all moments, that each moment is a development of the next, that time is asymmetric, that continuities of all sizes interdigitate all moments of life, that the details change slowly and massively and revolutionarily and make up all larger patterns and yet are the concurrent interlockings, &c gives the memory the form of time and explains thereby much of mind. This simultaneous, serial, and proximal temporal consignification surely facilitates the further recognition of sonic structure, eg the recognition of texture and its reweaving, the crosscorrelation of space and time, the hierarchicalization and measurement of temporal extent, the recognition of timbres and complex sonically-identified events, the self-reverbatory elongation and profound analysis of sounds, the very further recognition of chronology, the ecphoric identifying-use of precise temporal relations or qualities, intraareal and interareal full correlation, &c.

It may be that the very complexity, massivity, and infinitude of analyses compels the institution of common denominators, generalities, simplicities, schemes, and 'consciousness' in perception; that everything be scaled across time, space, and property in perception; it may be that the subjective simplicity of mind is illusory, that the mind is rather like an inscrutable hologram held to the collinear light of the day-to-day world to illume an arbitrary pattern.

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### WHY SHOULDN'T THE THEORY HAVE EXPLAINED AUDIOGNOSIA? Pat Gunkel

We can grant for the moment that vision presents problems that are, if not insuperable as I think, complicating for my theory by preventing any decision at this point about which of a collection of alternative special explanations holds, but in the case of audition and perhaps other main cases I can not see why any essential problems, at least in the way of the description of some mechanism that would work, remain. Now I understand our ignorances about the anatomy, physiology, and overall theory of the many levels of audition and my intent is elsewhere. But let us, equally without prejudice, look at my scheme and see what it would do. The diagram immediately under is meant to facilitate the imagination and not to insult the reader's intelligence.



In a word, I feel that Figures 1-4 are more or less sufficient to explain the distributive and epistemologic mechanics of audiognosia, and yet they are so simple as to be self-explanatory at a glance! What's going on? Area 41 may be taken as a lengthwise frequency spectrum.

A hypsicentric decussation of fibers between areas 41 and 42 produces a vergence in 42 Niduli or punctal cell clusters in 42 each receive a representative configuration from Some typical niduli are shown in Fig. 2 to have thus received a set of favorite pitche In effect, each nidulus 'resonates' only when its set of pitches are approximated by a Two typical sounds are profiled by intensity with pitch histograms in Figure 3. It will be seen that sounds are multicomponential and quite unlike one another by peak Were a third sound shown it would be obvious that they differ in different directions. Yet at the same time and in the same way apparently sounds are similar in various ways. The net result is a calculus of difference whose function is illustrated in Figure 4. Multicomponential sounds are ranked by multicomponential niduli by number of similarit! In this swift fashion sounds are analytically seperated and an echo of the world is synthesized, for any idea conveyed by pure sounds should become apparent in the ranking given sufficient time. The variety of fundamental comparisons availible to the tissue is at least the order of several hundred million cells and a trillion synapses of area and a "constellar" analysis" will be performed on successive sounds averaged multivaris

= Concurrent waveform in association cortex (motor plus somesthetic). Distribution very flat, mixed, (and integrocorrelated?), &c. Are (man's) association cortices characterized by a combination of bifacial isolation and power-by-size-or-ratio? (Or do association cortices see in what way they can inhibit behavior or response, the exigent forcing of this response by lower systems causing association cortex conceptual ascension????).

### SONIC ORDER Pat Gunkel

It is especially tempting to apply the various types of primary, secondary, and n-ary order order to auditory experience. Why all this should be is not particularly clear, but it may be that the considered "abstraction" of music is similar to this set of concepts as well as that individual and synesthetic order in audition is hidden by the primacy of vision but remains intriguing. It may also be that some of the problems of constancies and spatial complexity alleged vision are less noticeable in any peculiarities of man's audiognosia (wherein, because of the frequency spectrum, sounds are less independent of 'position' and do not have to be transformationally invariant in two or three intermapping dimensions). On the positive side, perhaps only in part because of these things, temporal order is relatively and absolutely more important, or superficial and profound simultaneous variation may be quantitatively and qualitatively less, as well as even temporally and thus wholly simpler, even by many orders of magnitude (it is striking that the number of acoustic fibers is only a few % the visual, that the monkey's cortic area 41 supposedly contains only about a thousandth of the cells of his cortex, and as well that man has 10% that number). If the above assumptions about the relative and absolute qualitative and quantitative simplicity and uniquity of audition are true and have any meaning it may follow that the signifigance of "higher order" orders is extremely elegant and that 72 primary, 5144 secondary, 370,288 ternary, &c classes of order are any and all individual, clear, continuous, and operationally explicable in that degree. Furthermore it is always of interest whether the classes of order that I have identified or that presumably exist are either the description of the world on which our minds rely and are too fundamental and clear-cut because of the relative importance of agglutinations, particular details, and particular evolutions of the real world of matter or mind, questions uniquely important, and filled with implications, at each of the "orders of order". I have repeatedly been interested in whether noogenesis has the effect of excluding large classes and amounts of things, relatively or absolutely, as it differentiates or-and pragmatically moves through things. Another interesting point, certainly beyond our analysis here or at all, is the quantitative, qualitative, and essential interrelations of the arbitrary structure of orders that I and even God has provided, which is not just the worry of ardent monists. and atomists. To which large categories might the orders be applied? Certainly music, voice, and the world of everyday sounds.

I am not a musicologist and regrettably cannot analyze music in a serious and comprehensive way, but I know a few thousand pieces of classical music and am synesthetic so that I can see visual pattern and color in music to a degree, and when I was younger the experience was occasionally vivid and elaborate. It is likewise likely that, far from having inventoried and systematized the intrinsic and interrelated sounds of the world, men have barely scratched its surface, whice obtusely defends my points and makes them indemonstrable. So the best thing

to do is run down my list of primary order and say a few examples.

The very nature of sounds is recurrence, their frequency, resonance, harmonics scales, limited variety of sources, longer oscillations, instrumental perfection being measured in terms of the concentration of recurrence, phonemes, &c.

A (or vv.vv.)

A particularly interesting thing about music is that it is temporal. reason for this is that to a certain extent one can point to visual objects and say that they have only this finite extent, the boundaries are very clear, &c. But sounds go on forever and often the boundaries are very vague or inexistent so that one is dealing with continua, and time is unlike space in being anisotropic or irreversible in effect. Of course after transformation visual experience has something of this continuity, anisotropy, and dispersion (and has it in, in and as I have shown, some degree all the time). Another object and the subject of this is that motor processes, emotions, and behavior have these sonic or musical properties. In part because of music's unique reputation as the universal language, even conveying some meaning despite ignorant and knowledgable creation and transformation. Evidently music can tell "something" or paint a picture of foreign lands, personalities, emotions, and abstract ideas and competes and overlaps with other languages in doing so. Evidently music can travel across time, transcend the idiosyncrasies of performance and reinstrumentation, move people to tears and hear precious insights, and progress nonsivaisticly despite fundamental and holistic changes. I say, tell "something", because what is put across is not always clear, explainable, accountable, or unique and may have implications and equivalents that are innumerable and antithetic; it is not only as if the message of music was universal, but essential, transcendent, a living being itself, microcosmic, and macrocosmic. Thus one's suspicions about the nature of music and audition beyond the ordinary and immediately begin and their subservient neurology go to speculate that here we have the analog or the bases of higher intellectual thought and the fate of the types of order stratifying at this altitude, eg through an equivalence of forms, continuity, progression, holism, integration, universality and essentiality of meaning (as in purposiveness), good 'development' of the types of order (as above), 'abstractness', &c. The deaf are eumentic or vision suffices, but one especially thinks of the close correlation of audition and speech so that all the speech sounds being handled in the above way suggests how man's intelligence could arise. It may be that human intelligence is indebted to the phylogeny of language so that an acultural man must have infrahuman intelligence and yet culture is species-specific so that its origin, acquisition, and use is conspecific; thus human intellect may be cultural and both impassable to other species such as the dolphin, so that for subtle reasons man's intelligence may be traditional in environmental order, a cultural order complex and specific beyond our guessing, and yet transmissible to the blind and/or the deaf as a species-specific cryptogram as to form, content, or method. In conclusion, it is open territory for guesses what quantity, kind, and complete of information, description, and symbolization there is in music and in mind. Bu it has been suggested that the "soul" of man resides in the pure variety, complex and subtlety of his imagination and acquaintance; one thinks of the above continu imposition, &c and sounds come as if through the night calling one home.

#### DESCANT Pat Gunkel

The comments that follow will hopefully shed light on the natures of music, order, and mind. They are nothing but an arpeggio with a few tremolos, despite the title.

Let us assume my synesthesia tells something profound about the structure of music. Since it is not a pictorial or simply chromatic thing but rather seems a faithful expression of the structure of music, it is possible, and it seems to me in fact, that it is a fortunate manifestation of the kind of order that is essentially characteristic of music. For a long time, in fact, people, such as Alexander Scriabin and Walt Disney, have dreamed of a monosensory art form that would mimic or represent what was artistically possible in the other senses, and of a polysensory art form that would unify the senses and, presumably, thereby human experience. So it is noteworthy that among the structural elements that I synestheticly perceive in music are two and three dimensional shapes, although this might really be trivial because the expectable use of everyday visual objects for the correlable sensation and inverse musical representation of their movement, distortion, and other concrete or abstract variation. Such shapes may stand for dimensional economies in the music and may reveal something of its complexity and texture.

It occurs to me one could use the various types of orders to build a superior musical instrument, to evaluate a composition, to analyze a score, and even to compose directly or to aid composition. The application could both be to the music and to the construction of useful timbres, as well as the instrument, which is a harmony in its own way. The net result of these enterprises might be a stagnacy of invention and an unbearable fascination with 'static' music. (It might be surmised that music duplicates civilization and civilization duplicates the objective backdrop. In our mise-en-scene the old order, which included pastoral continuities, certainties, necessities, leisurely and organic development, disconnected variety, trees, clouds, birds, fixity, and near-epical expanse, variety, and intricacy (amid much else) with a correspondent people and music, has been devastated and erased by a new order, whose distinquishing attributes include chaos, cacophony, claustrophobia, overdefinition, overcertaint; monotony, inorganic structure and color schemes, excessive variety, hectic pace, temporal confusion and isolation, emotional tenuity, overpopulation, instrumentalism, expedience in every way imaginable, moronic simplicity, spectral deadness or a love affair with grey, purposeless, anomie, holistic abstraction, and the like.)

I suggest that the highest type of music would necessarily involve organization at a level where concrete and abstract sound and music would be transformationally invariant in the same sense as vision overcomes translations, rotations, distortivariety and maniness, size variation, obscurities, and other traits of the phantasmagoria of our world; the process might be inverted in composition so that such high transformative invariants stood penetrably, hierarchicly, masterably, an enjoyably as simple deposits of higher order order organization or invariance at this level; or some identification of invariance recording by its fact some work or course of intellect, emotion, and knowledge could be art; or the higher order order may be employed as a language and/or as an act communicating a message from and to the appreciator; or finally, and most impressively, a work of art may be an active organization or processing of material which does not just show transformational invariance but has used it produce an organization of material i terms of one or all types of order, or synthesized a regime between the types of order or respected the natural asymmetries and interrelations of the types, perha to convey a living motif, flattering of a symbol, miniature of the world, &c, or in effect given "the next logical step" for a mind or an uplifting exercise, &c. Obviously these ideas are illaborate and need seperation, realization, & definiti

#### "LCOFS" AND "TOBOGGANS" IN AUDIOGNOSIA Pat Gunkel

Regardless of their eventual generality and development, loops and toboggans apply to what is heard. The sounds of the natural world are designed of different frequencies, intensities, temporal shapes, rhythms, clusters, durative components, textures, harmonics, velocities, directions of change, indeed direction in space, continuities, topologies, densities, energies, covariations, idiotropies, contextures, configurations, combinations, identities, recurrences, homoteleuties, homogenies, spectra, homomeries, polymeries, vacuities, monotonies, isotacties, isanomalies, cosurfaces, isosequencies, progressions, coordination, organism, anisotemporalities, roughness, randomnesses, comotilities, isocontents, isopores, isodynamies, isophores, groups, nomies, isonomies, precisions, meanings, isochronies, oscillations, antagonisms, degrees of freedom, complementarities, concinnities, isotropies, isophenies, holotacties, confluences, concerns, general variety, intermodulation of orders, and indeed any primary or higher order. This being so, loops may give toboggans and analyticosynthesize the structure of sound into a procurrent morphic random-continual hyperclassification which, eg through some mechanism of progressive dissociation by de-emphasization of simpler reticular- and moto-auditory terminal intercorrelation, could enlarge sonic conception: note that correlation is directible (specialized) and tendentially aborts so that it must be pushed over the hurtles and field of (a posteriori or arbitrarily) dissatisfactory concepts or reaches of correlation ("poppyfield", "bullishness" .. and "niveaux"). It might be thought at first that the diffuseness, asymmetry, complexity, soundness, &c of sounds prevents their circumscription for classification as is necessary for loops and toboggans to operate in tissue, but since any densities may be averaged and as such classified irrespective of seeming vagueness or fineness of distinction ("what are the maximum any distinctions") this is no problem and closure and decomposition, for ranking of forms by common resemblance, may occur in an n-polar fashion along "incident streams" to have its own sky'; this may occur both for simultaneous ("immediate") and nonsimultaneous sounds. It might be necessary for some region to "lean back" to an auditory region and "fasten" certain sounds or subsounds eg through temporary inhibition of their change so that "directional", "higher", or "arbitrary" selection and progress occur, or the establishment of considerations for "descending concepts"; any such idealization might stand behind the learning of phonemes in man or the broader construction of these into forms across time as in grammar and song. The criteria for candidature for loop-analysis yielding toboggans are not single but diverse and free: contour, turning, homogeneity, density, intercurrence, or anything most else; this does not mean that these are equally easy or equally used by tissue, nor that they are independent of the specific content of experience and its arrangement; they are probably used severally, complementarily, intersectively, and perhaps circumstantially. In any case, the world of sound is relatively finite and repetitive, with "ingredient density", and as such admits to a random-continual spectrum fully alluring to loops and toboggans.

#### THICMOGNOSIA Pat Gunkel

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To have a really "asensory" child, to see of what mind it would be able, one would have to have an absence of touch as well as hearing and sight, for there is a good chance that the way man is wired or the very quality (eg pattern and quantity) of touch makes it of equal or special importance in the appearance of our intellectual level. In this article I begin an analysis of touch by abstract speculation on its description.

There are the dimensions of time and the dimensions of space and the submodalities projecting on the parietal lobe. Tactile sensation derives from the entire cutaneous surface of the body and to some extent continues into its orifices. Somesthesia is exteroceptive and to a certain extent proprioceptive: swrficial and deep tactoceptive, thermoceptive, nociceptive, &c. Areas on the body differ greatly both qualitatively and quantitatively, and it would be interesting to have an exact map of what norms of such distribution exist, partly because from it we might derive some ethologic and anthropologic preconditions. Likewise such mapping on the cortex might be preconditional as to differences and similarities between species. As I have indicated elsewhere, even very elementary (but perhaps highly specific) organization may axiomatically produce various complexities, specificities, and capacities of behavior, especially when the totality of such mapping is considered as between all the cortices and rest of the nervous system and in conjunction with the nonnervous morphology of the animal (under genetic correlation). Disproportionate representation of certain senses or parts of the body (such as the hand, face, parts thereof) may give a decisive bias to the animal's behavior and even emotionality and preoccupation (centering), and likewise conveyance of patterns of behavior and value may follow from the geometry and interconnexion of body parts and areas in a somatic and dynamic topology. Space then is planar across and third-dimensional into the skin in some topodynamic equation.

Did man lose his hair that bare skin might afford comprehensive finer touch (as on the ape's fingertips) or textural recognition corresponding to (deriving from?) the expansion of association areas (especially, insofar as directly, area 7) serving fuller isomodal and polysensory perception (eg thigmovisual in the construction of bodily expression and of detailous environment, a la sight) - which is just an idea? Even the perception of large forms might have been aided (eg sharpness for diversity), semantic synesthesia, and the frontal expansion either way involved. The knowledge originable from the massive cutaneous sliding-over of penetrated vegetationwith its linearity, collinearity, recurrence, identity, homomery, homoteleuty, density, energy, homology, spectry, figury, configuration, isotacty, continuity, topology, idiotropy, roughness, randomness, isoplasty, oscillation, concern, confluence, intercurrence, contexture, isodynamy, comotility, bunching, grouping, rhythm, polymery, isopycnicity, precision, cosurfaces, anisotemporality isotropy, monotony, oligovalence, isanomaly, isotopy, isonumery, intrapuncty, isoprobability (which may fan-out sortatively), isosequency, progression, isogony, isocontent, algebra, concomitance, contrast, gradience, variation, isophory, nomy, isocausy, &c -- just can not be overestimated, and we should not kid ourselves that it has ever been determined. This brings in the dimension of time and the following discussion.

Minima and optima of distances, areas, shapes, degrees, kinds, and times of cutaneous stimuli have been suggested; one might add them up across the body, in that form, and arrive at some finite numbers and some systems expressible in terms of maxima and norms; however it may be that analogue information and operations bring in larger and peculiar quota, say by cortic euparallelism.

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But what is really interesting is the exact nature of the pattern of external events characteristic of day-to-day and developmental thigmognosia. I chose the root thigmo- because it means handling and that is the most generally suggestive. Actually what is integrated in parietal cortex includes temperature, pressure, pain, irritation, contact, texture, place, form, stereostructure, directi weight, force, cosmomorphology, time, spatiotemporal phenomenology, spatiotemporal etiology, somomorphology, somodynamics, and to some extent sociomorphology, sociodynamics, semamorphology, semadynamics, cognition, chronomorphology, and volitive possibility, including motor behavior. and affective transformations, polysensory and pansensory synesthesia and panneural integration. It would obviously be very important to quantitate these things and know eg to what extent (areas of) parietal cortex is passively v actively perceptual, perceptual v conceptual, or sensory v motor. The exact pattern of external events is peculiar, in any case. Eg the total relations of things (isotopy, isotacty, and isosequency) is discontinously variable and varying by the peculiar arrangements possible to the human hand. There is contactual discontinuity. What is the degree importance, and role of thigmoceptive fatigue, eg vis-a-vis visual fatigue? The body may touch itself, do so at extremes, and in this fashion character the environment, so topologic fusion occurs and the metry and topology both of the body and environment may essentially transform and thus transfer patterns. One might expect somewhere in the parietal (eg area 7) or other cortex an attention mechanism, analogous to the visual and auditory, is able to metamorphose, edit, concentrate on, amplify, &c thigmoception and likewise affect the rest of the brain One might expect an analogy to the co- and broad representation of the fovea (as well as tunneled vision) in eg digital representation for fibrous and/or functional reasons; moreover what is the comparative areal and real representation of such series as trunk-shoulder-forearm-hand-palm-fingers-fingertips-best fingert and what is the functional consequence of this doubtless odd design? Moreover what are the anatomy, function, and consequences of parietal ipsilaterality, contralaterality, bilaterality, and asymmetry; how broad is the concept of symmetry projected into space and the other mental function (may it here or elsewhere be responsible for the existence or basis of certain mental operations or such generally, such as reversibility, equivalence, co-seriation, and calculati of space, time, thought, action, memory, and feeling, and their alternation)? In this connexion it is always of interest to ask what is cosociable with eg parietal processes so that these act metaphorically, abstractly, creatively, and symbolically; for both this and the previous question one wants to know whether man has any special neurology, perhaps critical for his uniqueness? In any event, this thigmognostic ad libitum and casual topologic variability and awareness is again illustrated by the ability of fingers to touch around a cylinder or through a torus, to realize wonderful matric topologic connectivity in lacing through a cluster of leaves, and perhaps to produce important algebraic and logical ideas or proto-ideas by shooting a hand through water or earth. Objects may be pushed or knocked about an isotopic or isotactic space and hence effect causal transpositions motorally deliverable into mental operations. Objects at a distance that may be reached or walked to, do not, unlike vision, change size (in fact here would be a thigmovisual neoperable equivalence of spatial and temporal magnitude, which collapse could inversely effect a quantization and metrication of the two, operationalize a range, and effect a symbolic operation thereafter horizontally and vertically hierarchizable, retrospectable, &c); hence an exploitable discrete clustering occurs. The subordinacy of strict isosequency, size variation, and of nonuniquity of topology (&c?) could give this tissue or thigmognosia an algebraic advantage and lead to the (labile) formation of novel mental processes and abilities. The visual and auditory worlds are perspectival and autocentric, but in thigmognosia space may be hyperbolic and allocentric (paradoxically, in part because of thigmognostic somatognosia). Too, the thigmognostic coordinate

See McGraw-Hill 1972 Yearbook of Science and ochnology p348 "Prosthesis".

See "braille" (rate equals?), the tactile quasi- 4 This might be analogous to the arcuate fast isual prosthetic (eg 20x20x20x8") argues vision is for speech and handwriting for reading (how npeculiar (test for line ability (braille dots) of important?). ouch! One must re-scale for whole body vs retina!) 5

The function of area 17 lines might actual: to increase resolution:

"Mere-match spectra" (inversion): any fits congruences between things or spectra are use

system may be relatively chronometric and relativistic, than the relatively spatiometric and absolutistic audiognosia and visuognosia. It has been suggested that our cognition owes itself to organismal reaction to and interaction with external events, and the greatest centrifugation is obviously motor (and perhaps the most salient, versus internal sorting and prediction in the isolation of causality; or perhaps more important for (1) cognitive development is not causality per se but the progressive interaction of the organism with its environment by linear, intentional acts, and thus sensorimotor life); obviously thigmognosia is of great importance to the registration and hence differentiation of motor acts (at least, perhaps essentially, as a bridge for any subsequent cognitive role of vision and audition, as in the fineness and comparatively (frontally, actually) direct origination of motor causation (recall confabulation is pathognomic of parietal lesion); perhaps there is an importance of this (eg thigmognosia) in an essential reflexual-coordination stage of ontogeny that cannot be sufficiently stressed). Another provocative peculiarity of thigmognostic behavior and experience is illustrated by relationships, actions, and habits where different parts of the body contact each other, cover each other, slide over each other, rhythmically rub each other, and interlock as in the ideal case of interdigitation, for in this way they comap; but so may vision via desultory eyemovement imagal superposition, so the main overall distinquishment of thigmognosia may be in the fact and peculiar properties of the plasticity of its field (field-field imposition, crossword-puzzle variability, tinker-toy varitopology, anthropomorphosis, varimetry, kinematic polycentrism, pluripotent motognostic or at least dynamic form and polymorphism, and yet somatic rigidity versus the palimpsestic and abstract visual field (and yet here we see that the two fields may not be too different)).

It is easy to think of analogies to other senses. If one lays one's hand down the pressive area is like a visual planum. If one slides one's foot along on a carpet the serial process is like a timbre or a simultaneous sward seem by the eye (spatiotemporal equivalence). A fine texture is like a high note and a coarse texture like a base note. Phonemic 'figures' are like a vase felt or seen. A smack is like a crack is like a flash. Depth texture is felt like stereopsis. Degrees of pressure, temperature, and pain are felt like degrees of luminance and loudness, different colors or compact sonic texture, and pain upon intense light or sound.

Likewise there is no difficulty in suggesting similar fundamental mechanisms as apply for sight and hearing account for thigmognosia, such as random continua, saturant virtual waves, condivergence, predictive circumvention, retrospection and retrospective analysis, ascending elegance (minimization), competitive prediction, operational devolution, mere-matches, euparallelism, isopory, clathration, anamorphosis, continual prediction, metaphrastic curvature, "68 possible systems of mnemic classification", infinite proactive generalization and redintegrative abstraction, partitioning, alternative clustering for hyperplanar semiselection and late exclusion, redimensionalization, cyclodromic delomorphs embellishable by random schemata, &c. Eg the textural sorting that might occur under random continua (as in the case of vision) is such that what is formed is merely a translationally invariant general-interpretive language leaving curval residues and the texture of what part of the object is presented, thereafter imported and integrocorrelated by well-dispersed cortices; whatever bits are picked up by heteroperspectival cells are parallactically averaged over, and fused by the higher cortices governed by autocratic holognostic prediction.

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On one hand we could imagine that objects seen are memorized eidetically and that new objects are evaluated in terms of their degree of fit with precise images, in precise aspects, and in their imagal entirety, or with dimensions between more than one precisely imaged object. On the other, that an object seen establishes a crude approximation in the tissue, that may then be compared with subsequent objects, or that a common image or common images of this kind in various dimensions might gradually be built up by strings of objects as universal for objects, and recognition occur by virtue of one of these images or aspects or by differential summation over the many virtue of one of these images or aspects or by differential summation over the many images or aspects, eg in the sense that the seeming recognition must not fail all the tests supplied by the objects or is identified by the least failure, in which case a quite different mechanism might evolve over time to solidify normal recognition.

Multiple polar and continual comparisons of this kind could persist in time in diverse ways. Their sequential states could be preserved intact and undiminished in activity as new states evolve out of them, and recognition occur by their coexistence: this might cause sequential states to evolve in opposite directions; the myriad states might create non/coexisting summations, and the emergent sequences might be furcal and divide indefinitely, perhaps interacting or fusing at their periphery with other

homologous and nonhomologous sequences.