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M^*: Vector Representation of the Subliminal Seed Regime of M^5

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Abstract—A supplement to the M^5 model of mind/matter interactions[1] is proposed wherein the subliminal seed space that undergirds tangible reality and conscious experience is characterized by an array of complex vectors whose components embody the pre-objective and pre-subjective aspects of their interactions. Elementary algebraic arguments then predict that the degree of anomalous correlation between the emergent conscious experiences and the corresponding tangible events depends only on the alignment of these interacting vectors, *i.e.*, on the correspondence of the ratios of their individual "hard" and "soft" coordinates. This in turn suggests a subconscious alignment strategy based on strong need, desire, or shared purpose that is consistent with empirical experience. More sophisticated versions of the model could readily be pursued, but the essence of the correlation process seems rudimentary.

Keywords: Consciousness-related anomalies — engineering anomalies — human/machine anomalies — mind/matter interactions — models of mind/matter interactions — remote perception

Background

The M^5 model provided us with a conceptual architecture whereby anomalous mind/matter interactions could be accommodated via circuitous routes of information processing that involved the unconscious mind and intangible physical processes (*cf.* Fig. 1)[1]. In particular, it implicated the deepest portions of these domains as an holistic, or undifferentiated regime in which mental and material aspects could not be distinguished, *per se*, but wherein dwelled subliminal "seeds" of pre-information, from which material events and corresponding mental experiences could emerge (*cf.* Fig. 2). No attempt was made, however, to propose any conceptual format or mechanics for the subliminal seed region that would allow it to germinate *anomalous* mind/matter correlations, other than to suggest that a directed intention or volition might be imposed on such emergence processes via a "backwards causality" or teleology that utilized negative-time branches of the physical formalisms. The purpose of this note is to sketch an analytical metaphor that could accommodate both normal and anomalous emergence effects.

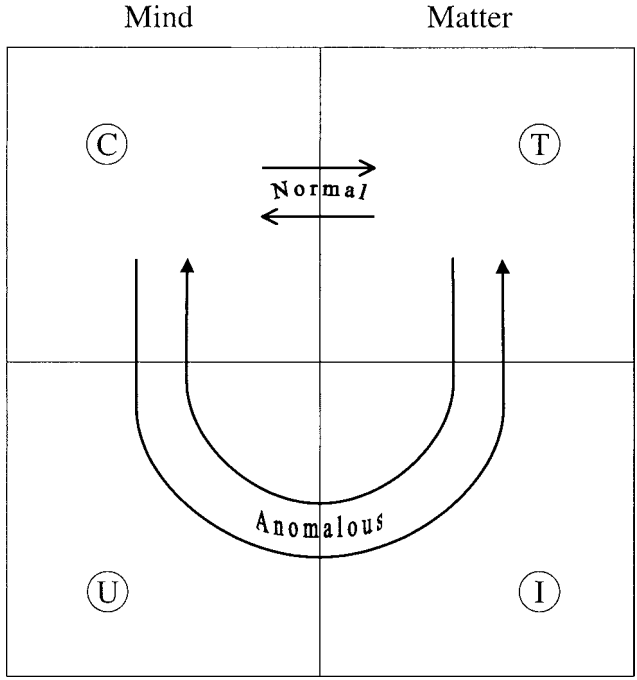

Fig. 1. Normal and anomalous routes of information transfer in the modular model of mind/matter manifestations $(M^5)^{(1)}$. Ⓒ denotes all conscious mental processes; Ⓤ denotes all unconscious processes; Ⓣ comprises all tangible, *i.e.*, observable, physical events; Ⓘ subsumes all intrinsically unobservable processes undergirding tangible reality. (The arrows on this and the following figure, and the associated sequential vocabulary in the text, do not necessarily imply temporal or spatial relations, *per se*, but rather suggest an implicit conceptual hierarchy.)

Assumptions and Formats

We begin by restating the M^5 presumption that every element or complex of reality that emerges from the seed region manifests both as an event/situation/state in the material domain, and as a corresponding experience/impression/perception in the mental domain. What is at issue now, however, is how such seeds may configure and interact in their own regime to acquire the capacity for such manifestation as a plethora of normal, and anomalous, mind/matter displays. In this extension of the model, our first proposition is that some interaction of two or more such seed elements or complexes is a requisite stimulus for such palpable manifestations. Next, we propose that if the interaction is "linear," in the sense that $[S_1] + [S_2] = [S_1 + S_2]$, where $[\ ]$ denotes a given form of representation of the seed manifestations, the ensuing event/experience dyads will be "normal." If they are "non-linear," *i.e.*, if $[S_1] + [S_2] \neq [S_1 + S_2]$, they will be "anomalous," by the usual definitions.

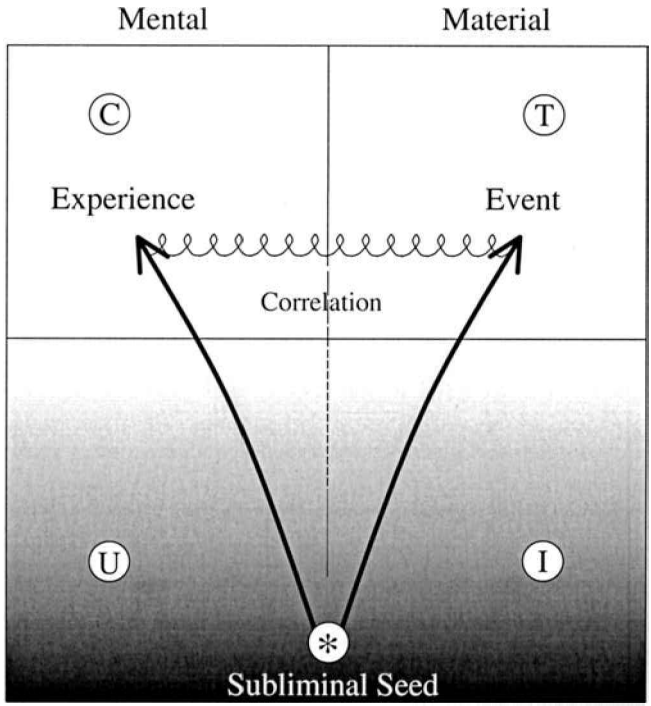

Fig. 2. Correlation of tangible events and conscious experiences emergent from subliminal seeds(1).

For these cases, various mathematical and schematic non-linear interactions may then be explored for their metaphoric appeal.

To pursue such representations, we must first make reference to some experiential concepts drawn from the conscious mental and tangible physical domains Ⓒ and Ⓣ. In particular, we stipulate that all states of conscious mind and of material reality can be assigned two primary categories of descriptors which, for lack of better terms, we shall label "objective" and "subjective," or simply "hard" and "soft." Table 1 contains a lengthy list of possible pairs of such descriptors, none of which is completely adequate, but the ensemble of which captures some of the essence of this division(2). Although these designations can only be expressed in upper-level nomenclature, *i.e.*, in the vocabulary of modules Ⓒ and Ⓣ, nonetheless, as we conceptually proceed downward through the underlying, less palpable Ⓤ and Ⓘ domains, we presume that some aspects of these must persist, even into the undifferentiated lowest level, although there they become progressively more difficult to specify or articulate. What is essential to our purpose, however, is that at any level these categories be regarded as orthogonal and complementary, in the usual physical and mathematical senses, and as fully comprehensive to triangulate

TABLE 1
Subliminal Seed-Space Coordinates—Possible Conjugate Pairs

Adjectives			Nouns		
"Hard"		"Soft"	"Hard"		"Soft"
objective	⟷	subjective	substance	⟷	tone
rational	⟷	emotional	doing	⟷	being
analytical	⟷	aesthetic	knowing	⟷	feeling
pragmatic	⟷	passionate	intellect	⟷	intuition
sharp	⟷	diffuse	implementation	⟷	conception
detailed	⟷	holistic	situation	⟷	sensation
rigorous	⟷	flexible	diagram	⟷	impression
deterministic	⟷	probabilistic	function	⟷	form
masculine	⟷	feminine	words	⟷	music
particulate	⟷	wavelike	yang	⟷	yin

all objective and subjective mental experience, in the usual psychological, philosophical, and spiritual senses of those terms. It is then presumed that if we appropriate and pursue some established mathematical formalism for representing such components and their interactions, the analytical results may retain some metaphoric relevance for the emergence of anomalous mind/matter manifestations.

As a simple format to illustrate this proposition, let us represent all seeds of potential information resident in the unified lowest level of Ⓤ/Ⓘ by complex quantities, utilizing either the usual rectilinear or polar notations, as sketched in Fig. 3:

$$\mathrm{S} = \mathrm{s} + i\sigma = \mathcal{S}e^{i\phi} \tag{1}$$

$$\text{where } \mathcal{S} = \sqrt{\mathrm{s}^2 + \sigma^2} \text{ and } \tan\phi = \frac{\sigma}{\mathrm{s}}.$$

It is tempting to presume that the orthogonal designators s and σ somehow embody the "pre-material" and "pre-mental" aspects of the seeds, respectively, but this is probably too direct and simplistic an assignment. More likely, they presage the "hard" and "soft" discriminations just proposed, but again, in an ineffable, pre-emergent form that pertains to both the material and mental paths. Hence, it is next necessary to specify a functional assembly of such representations that does denote the palpable material or mental properties associated with any such item or system of items, as denoted by [ ] above. Here we shall take our hint from quantum wave mechanics, where the enduring presumption has been that it is the product of the complex quantity with its conjugate, $\mathrm{S}^* = \mathrm{s} - i\sigma = \mathcal{S}e^{-i\phi}$, that represents its probability of observation, *i.e.*,

$$[\mathrm{S}] = \mathrm{S}\mathrm{S}^* = \mathrm{s}^2 + \sigma^2 = \mathcal{S}^2 \tag{2}$$

For our purposes, we might generalize this to represent a "probability of ex-

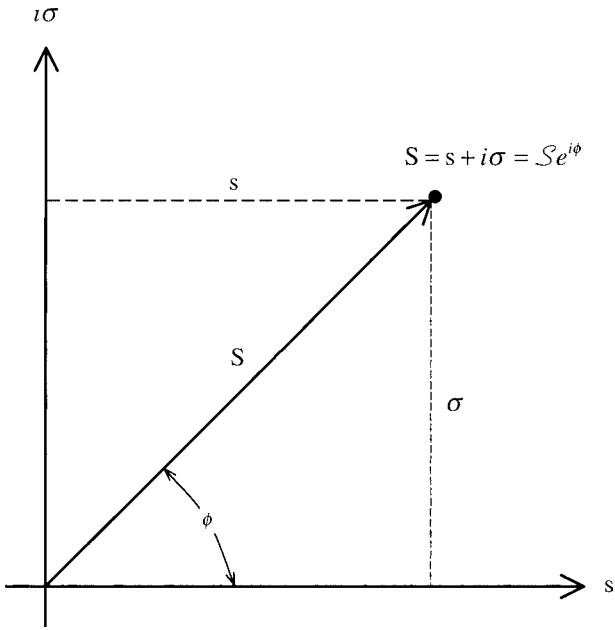

Fig. 3. Representation of a subliminal seed by a vector in the complex plane, having rectilinear coordinates s and $i\sigma$, or polar coordinates $\mathcal{S}$ and ϕ.

perience." Note that in either coordinate representation [S] is the square of the length of the vector radiating from the origin to the seed state location in the complex plane. Note also that although this and subsequent illustrations utilize only the first quadrant of the s, $i\sigma$ space, negative values of either coordinate can be accommodated in the vector algebra.

Seed Interactions

Let us now consider the interaction of two (or more) such seed states, still of course in the undifferentiated regime. Label them S_1 and S_2, and presume that the interaction can be represented as an addition process, $S_{12} = S_1 + S_2$, where S_{12} now represents their interacting or bonded state (*cf.* Fig. 4). In the rectangular frame,

$$S_{12} = S_1 + S_2 = (s_1 + i\sigma_1) + (s_2 + i\sigma_2) = (s_1 + s_2) + i(\sigma_1 + \sigma_2) \tag{3}$$

whose conjugate product is

$$\begin{aligned} S_{12}S_{12}^* &= (s_1 + s_2)^2 + (\sigma_1 + \sigma_2)^2 \\ &= s_1^2 + 2s_1s_2 + s_2^2 + \sigma_1^2 + 2\sigma_1\sigma_2 + \sigma_2^2 = \mathcal{S}_{12}^2 \end{aligned} \tag{4}$$

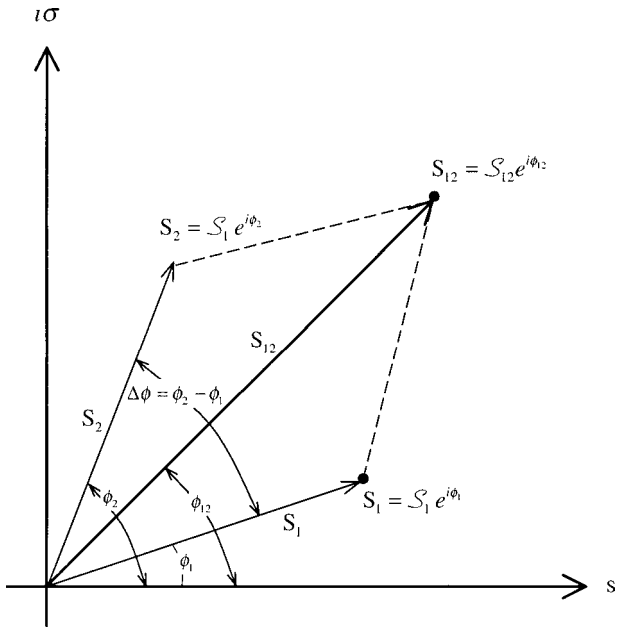

Fig. 4. Complex vector representation of the interaction of two subliminal seeds, $S_{12} = S_1 + S_2$.

which, when compared to the sum of the conjugate products of S_1 and S_2:

$$S_1 S_1^* + S_2 S_2^* = s_1^2 + \sigma_1^2 + s_2^2 + \sigma_{21}^2 = \mathcal{S}_1^2 + \mathcal{S}_2^2 \tag{5}$$

differs by two terms, *i.e.*,

$$\mathcal{S}_{12}^2 - (\mathcal{S}_1^2 + \mathcal{S}_2^2) = 2(s_1 s_2 + \sigma_1 \sigma_2) = \delta_{12} \tag{6}$$

It is this disparity, δ_{12}, introduced in the vector combination of the two seeds, that we shall presume represents the palpable anomalies of the interaction that manifest in Ⓒ and Ⓣ. (Later we shall attempt to interpret these generalizations in more specific contexts, such as our human/machine interaction and remote perception experiments.)

The situation perhaps can be better visualized in the polar frame, where

$$S_1 = \mathcal{S}_1 e^{i\phi_1} \tag{7a}$$

$$S_1 S_1^* = \mathcal{S}_1^2 \tag{7b}$$

$$S_2 = \mathcal{S}_2 e^{i\phi_2} \tag{7c}$$

$$S_2 S_2^* = \mathcal{S}_2^2 \tag{7d}$$

$$S_{12} = \mathcal{S}_1 e^{i\phi_1} + \mathcal{S}_2 e^{i\phi_2} \tag{7e}$$

$$S_{12} S_{12}^* = \mathcal{S}_{12}^2 e^{i\phi_{12}} \tag{7f}$$

and ϕ_1, ϕ_2, and ϕ_{12} are phase angles, such that

$$\phi_{12} = \tan^{-1}\left[\frac{\mathcal{S}_1 \sin\phi_1 + \mathcal{S}_2 \sin\phi_2}{\mathcal{S}_1 \cos\phi_1 + \mathcal{S}_2 \cos\phi_2}\right] \tag{7g}$$

To evaluate $\mathcal{S}_{12}^2$, utilize the law of cosines:

$$\mathcal{S}_{12}^2 = \mathcal{S}_1^2 + \mathcal{S}_2^2 + 2\mathcal{S}_1\mathcal{S}_2 \cos(\phi_2 - \phi_1) \tag{8}$$

so that the difference between $\mathcal{S}_{12}^2$ and $(\mathcal{S}_1^2 + \mathcal{S}_2^2)$ falls out by comparison:

$$\mathcal{S}_{12}^2 - (\mathcal{S}_1^2 + \mathcal{S}_2^2) = 2\mathcal{S}_1\mathcal{S}_2 \cos(\phi_2 - \phi_1) = \delta_{12} \tag{9}$$

where we shall henceforth denote $\phi_2 - \phi_1$ as $\Delta\phi$, noting that it is *not* the same as ϕ_{12}. Rather, it is the phase difference between the vectors S_1 and S_2 which, along with their absolute magnitudes, $\mathcal{S}_1$ and $\mathcal{S}_2$, determines the scale of the anomalous term, δ_{12}. [We may confirm the equivalence of the rectilinear and polar expressions for δ_{12} via the trigonometric equality:

$$\cos(\phi_2 - \phi_1) = \cos\phi_2 \cos\phi_1 + \sin\phi_2 \sin\phi_1.]$$

If one wishes a dimensionless normalization that captures the relative importance of the anomaly, in either the rectilinear or polar form, one might simply invoke as denominator the "linear" sum of the separate "experientials," $\mathcal{S}_1^2 + \mathcal{S}_2^2$, *i.e.*,

$$\hat{\delta}_{12} = \frac{2(s_1 s_2 + \sigma_1\sigma_2)}{\mathcal{S}_1^2 + \mathcal{S}_2^2} = \frac{2\mathcal{S}_1\mathcal{S}_2 \cos\Delta\phi}{\mathcal{S}_1^2 + \mathcal{S}_2^2} \tag{10}$$

or conversely,

$$\hat{\mathcal{S}}_{12}^2 = \frac{\mathcal{S}_{12}^2}{\mathcal{S}_1^2 + \mathcal{S}_2^2} = 1 + \hat{\delta}_{12} \tag{11}$$

In the polar form, $\delta_{12} = 2\mathcal{S}_1\mathcal{S}_2 \cos\Delta\phi$, the importance of phase correlations between the systems S_1 and S_2 in determining the scale of the anomalous term is particularly explicit. Consider the special cases where S_1 and S_2

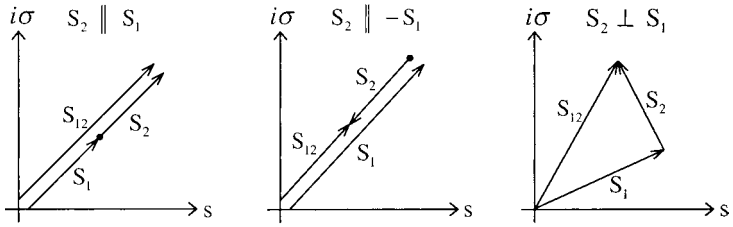

Fig. 5. Three special cases of alignment of two interacting seed vectors (*cf.* Table 2).

TABLE 2
Seed Vector Summations

	$\Delta\phi$	$\mathcal{S}_{12}^2$	δ_{12}	ϕ_{12}	$\hat{\mathcal{S}}_{12}^2$
$S_1 \| \| S_2$:	0	$(\mathcal{S}_1 + \mathcal{S}_2)^2$	$2\mathcal{S}_1\mathcal{S}_2$	ϕ_1	$(\mathcal{S}_1 + \mathcal{S}_2)^2 \big/ (\mathcal{S}_1^2 + \mathcal{S}_2^2)$
$S_1 \| \| -S_2$:	180°	$\lfloor \mathcal{S}_1 - \mathcal{S}_2)^2 \rfloor$	$-2\mathcal{S}_1\mathcal{S}_2$	ϕ_1 or ϕ_2	$\lvert \mathcal{S}_1 - \mathcal{S}_2 \rvert^2 \big/ (\mathcal{S}_1^2 + \mathcal{S}_2^2)$
$S_1 \perp S_2$:	90°	$\mathcal{S}_1^2 + \mathcal{S}_2^2$	0	$\phi_1 + \tan^{-1}(\mathcal{S}_1/\mathcal{S}_2)$	1

are parallel, anti-parallel, and perpendicular, respectively (*cf.* Fig. 5 and Table 2). We may generalize this vector algebra to conclude that if S_1 and S_2 align at a relative phase angle $\Delta\phi < 90°$, (or $>270°$), the anomalous term δ_{12} will be positive; if $90° < \Delta\phi < 270°$, it will be negative. Only for $\Delta\phi = 90°$ or $270°$ will δ_{12} disappear, and the compound of $\mathcal{S}_1^2$ and $\mathcal{S}_2^2$ be linear.

Therefore, if the palpable experience/event dyad devolving from the seed interaction S_{12} is identified with the conjugate product $(S_{12}S_{12}^*)$, it follows that for given magnitudes of $\mathcal{S}_1$ and $\mathcal{S}_2$, this will display no single value of $\mathcal{S}_{12}$, but rather a distribution of values ranging from $(\mathcal{S}_1 + \mathcal{S}_2)^2$ to $|\mathcal{S}_1 - \mathcal{S}_2|^2$, *depending on the phase alignment of the two subliminal systems.* Only at $\Delta\phi = 90°$ or $270°$ will this coincide with the linear combination of the separate system values, $\mathcal{S}_1^2 + \mathcal{S}_2^2$. For example, if we simply assume that over many such $\mathcal{S}_{12}$ interactions $\Delta\phi$ will distribute uniformly over 0–360°, δ_{12} will distribute as the cosine function, whose mean value is clearly zero, and hence the mean value of $\mathcal{S}_{12}^2$ reverts to $\mathcal{S}_1^2 + \mathcal{S}_2^2$ (*cf.* Fig. 6). All of this we might associate with a "normal" statistical behavior. If, however, any distortion or bias is introduced into the alignment function, $\Delta\phi$, this will be reflected in a non-zero mean of δ_{12} and a different mean value of $\mathcal{S}_{12}^2$, which we may then associate with an anomaly. In this view, the common laws of probability (which are intrinsically experiential), would simply reflect the normally prevailing random distributions of $\Delta\phi$, whereas the appearances of statistical anomalies in any interaction would devolve solely from a biasing, volitionally or otherwise, of those $\Delta\phi$ distributions. (The situation is thus somewhat similar to atomic-scale scattering phenomena where the differential cross sections

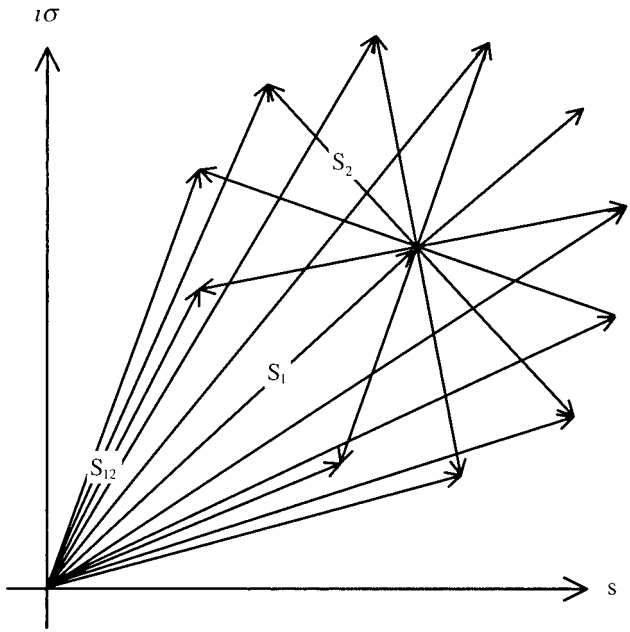

Fig. 6. Interactions of two seed vectors, randomly aligned.

derive solely from the phase shifts of the incoming de Broglie waves as they pass over the potential profile of the scattering particle.)

The mechanisms for such individual and collective biasing of the $\Delta\phi$ distribution in any interaction context are inescapably speculative and obscure, given that all of this must function in the subliminal domain to which the entire metaphor pertains. However, if we reflect on common allusions of our experimental operators and percipients to "getting in phase/resonance with... (any given device, task, or person)," a conceptual recipe could be suggested. Recalling that the rectangular and polar geometries are related by simple trigonometric relations, *e.g.*,

$$e^{i\phi} = \cos\phi + i\sin\phi \tag{12a}$$

$$\mathrm{s} = \mathcal{S}\cos\phi \tag{12b}$$

$$\sigma = \mathcal{S}\sin\phi \tag{12c}$$

$$\tan\phi = \frac{\sigma}{\mathrm{s}} \tag{12d}$$

it follows that the phase angles simply reflect the prevailing ratios of the "soft" to the "hard" components of the systems involved. Thus, an increase in the anomalous effect by better alignment of ϕ_1 with ϕ_2 could be achieved by a cor-

responding balancing of the ratio of σ_1/s_1 to that of σ_2/s_2. That is, the respective characters of the two seed elements, as expressed in the relative importance of their soft *vs.* hard features, should bear as much similarity as possible.

At some point we would like to specify what portion of the anomalous effect appears in the "hard" and "soft" coordinates of the bonded S_{12} system, respectively. Given the abstract definitions of s and σ in the pre-emergent domain, we have no guarantee how they will manifest in the palpable upper regions of the bonded system, but since, for the "normal" composition, $\mathcal{S}_{12}^2 = \mathcal{S}_1^2 + \mathcal{S}_2^2 = s_1^2 + s_2^2 + \sigma_1^2 + \sigma_2^2$, whereas all anomalous compositions add the terms $2s_1s_2 + 2\sigma_1\sigma_2$, it may not be unreasonable to suggest that the product $2s_1s_2$ is somehow associated with the "hard" segment of the anomalous effect and $2\sigma_1\sigma_2$ with the "soft" segment, where again we could normalize both of these by the "normal" sums $s_1^2 + s_2^2$ and $\sigma_1^2 + \sigma_2^2$, respectively.

Alternatively, we might argue that since we originally assigned $S_{12}S_{12}^* = \mathcal{S}_{12}^2$ the role of representing the palpable properties of the bonded system, and that only the objective features are strictly measurable, all of the anomalous component, $\delta_{12} = 2(s_1s_2 + \sigma_1\sigma_2)$ must appear in that category. Either way, the prediction is that the anomalous behavior of the bonded system is enhanced by optimizing the products s_1s_2 and/or $\sigma_1\sigma_2$, which is again tantamount to optimal alignment of the vectors S_1 and S_2, but also to balancing their magnitudes, since the normalized ratio $2s_1s_2 \big/ \left[s_1^2 + s_2^2\right]$ has its maximum at $s_1 = s_2$.

We recognize that our representation of the subliminal seed systems by single vectors in the complex plane must be extremely over-simplified, but several levels of complication discourage attempts at elaboration. Even setting aside the intrinsic ineffability of this seed domain and the vagueness, proliferation, and inherent difficulties in specification, let alone quantification, of the possible hard and soft features listed in Table 1, even in the palpable domains Ⓒ and Ⓣ, we would still need to acknowledge the personal, temporal and contextual variabilities, probabilities, and uncertainties that must embellish each of these property sets in any quadrant of the mind/matter space. Nonetheless, the essence of their complementarity and the anomalous effects that may devolve from it could, in principle, survive even these ponderous generalizations. Again taking a metaphoric example from quantum wave mechanics, we could imagine designating complex wave functions, rather than mere points in the complex plane, to represent the interacting seeds in more comprehensive formats, but still regarding their complex products as representative of their experiential manifestations, much like the traditional Schrödinger formalism. Yet more sophisticated quantum algebraic formats could conceivably be turned to the task, so long as they offered the requisite capacities for non-linear interactions.

Also to be questioned is whether other interaction recipes beyond the simple addition $S_{12} = S_1 + S_2$ could profitably be explored. The obvious next candidate would be the multiplicative combination, $S_{12} = S_1S_2$, but in Appendix I we

show that this does not generate similar non-linearities. Also, the possibility could be raised that a similar vector representation could be imposed at the Ⓒ/Ⓣ level of mind/matter interactions, without invoking the subtleties of the subliminal seed regime. As sketched in Appendix II, this too offers little additional insight.

Applications, Interpretations, and Implications

If this metaphorical musing is to have any pragmatic benefit, it needs to provide some advances in the design, operation, and interpretation of our panorama of mind/matter experiments. To to so requires more specific assignments of the salient elements of the schematic model to those of particular experimental interactions. For example, for our benchmark REG studies[3], we need some specification of the pertinent "soft" and "hard" characteristics of the two interacting participants, in this case the machine and the operator, even before transforming them into the subliminal seed phase space. Since this lower regime is inherently ineffable except by abstract associations with perceptible Ⓣ and Ⓒ characteristics, it seems that our only route is first to identify such features at these manifest levels, and then assume that they are isomorphically related to, or rooted in, corresponding components at the seed level. Thus, presuming that each operator brings to the interaction with the REG device some balance of hard and soft characteristics of the sort listed in Table 1, some seminal aspects of which exist in the subliminal level, we can pose two corresponding seed components, s_o and σ_o, whose absolute and relative importance define a vector S_o of magnitude $\mathcal{S}_o$ and phase ϕ_o in the seed space. Similarly, if we assume that the machine, in addition to its evident technical features, possesses a certain subjective character of its own, we can also posit for its seed-level representation two corresponding hard and soft coordinates, s_m and σ_m, comprising the complex vector $S_m = \mathcal{S}_m e^{i\phi_m}$. (This anthropomorphic assumption is of course intrinsically unverifiable, but we might reflect on the attributes of personality, purpose, and compatibility we commonly ascribe to our computers, appliances, and automobiles in our daily interactions with them. We might also concede that our assessment of the subjective features of the human operators is similarly indirect, largely derived from behavioral characteristics displayed in our interactions with them. In the same sense, the experimental machines, by their external appearances, the nature of their feedback displays, the noise they emit, and the manner in which they respond to our initiatives, likewise convey certain subjective characters with which the operator may resonate, or possibly even identify.)

Now, if over a given period of interaction the vectors S_o and S_m align randomly in terms of their ϕ_o *vs.* ϕ_m orientations, the resulting palpable appearance of their interaction, $\mathcal{S}_{om}^2$, will display a "normal" distribution centered on $\mathcal{S}_o^2 + \mathcal{S}_m^2$, where $\mathcal{S}_o^2$ and $\mathcal{S}_m^2$ could be identified as the individual characteristics of the operator and machine, respectively, in the absence of that interac-

tion, as might be determined by calibration, conventional theoretical chance calculations, or more subjective criteria. If, however, the operator can achieve some subliminal phase resonance with the machine, the relative phase angle distribution would shift toward a better alignment of the seed vectors S_o and S_m, so that the mean value of the $\mathcal{S}^2_{om}$ distribution would shift to a higher value; conversely, if the alignment distribution were to worsen, the $\mathcal{S}^2_{om}$ experiential mean would be reduced below the "normal" value, *i.e.*, using our earlier notation scheme,

$$\mathcal{S}^2_{om} = \mathcal{S}^2_o + \mathcal{S}^2_m + \delta_{om}$$

where δ_{om} again represents the anomalous component of the interaction. Note that in the first interpretation suggested in the previous section, δ_{om} must subsume not only the change in the output count distribution of the machine, but also any changes in the mental state of the operator that arise in the interaction, such as the frequently reported feelings of "resonance," identification, or transference of experience with the machine. In the alternative interpretation, these subjective properties would be excluded from δ_{om} because of their lack of quantitative measurability.

Application of the model to our PRP experiments[4] could proceed in much the same fashion, with the possible complication that the relative importance of the percipient's resonance with the agent, *vis-à-vis* that with the target, *per se*, has never been totally clarified empirically. If the latter predominates, the argument could proceed much as above, with the target characteristics replacing those of the machine, and the resulting anomalous manifestations $\mathcal{S}^2_{pt}$ and δ^2_{pt} representing the anomalous information acquisition, and possibly the altered mental state of the percipient. If the primary phase resonance is with the agent, the formalism could be similarly cast, but the relative magnitudes of the prevailing soft and hard components of the two seed vectors could be quite different. Nonetheless, the broadening of applications from mind/matter interactions into anomalous interpersonal interactions seems straightforward.

For either of these genres of application, however, it remains to suggest a recipe for incorporation of the teleological intentions of the human participants into the interaction dynamics. That is, how does the primary empirical correlate of the anomalous effects, namely the pre-stated, conscious intention of the operator to achieve greater (high intention) or lesser (low intention) numbers of binary coincidences in the output data strings of the REG, or the intention of the percipient to acquire greater than chance degrees of information about details of the remote physical target, impress itself upon the subliminal alignment process? Elusive as it may be to specify, the most likely possibility is that it is the human *desire* or *need* that drives this alignment; desire or need that can be consciously expressed in tangible terms, but that is inevitably imbued with emotional overtones that can readily impregnate the seed region of the unconscious mind, wherefrom they can condition the mani-

fest mental experience and, in this model, the material behavior as well. It is this "wind" or "field" of desire, prevailing over the full conscious and unconscious scope of the interactions, that may align the subliminal vectors, like seabirds on the beach or dipoles in a dielectric, and thereby bias the tangible results.

When we turn to the FieldREG applications[5], any tangible correlate of conscious operator intention appears to be replaced by some less specific index of cohesiveness, coherence, or resonance of the prevailing group environment (note the objective/subjective duality of these descriptors). But rather than weakening our teleological hypothesis, these experiments actually strengthen and extend it, in the sense that here the desire or need already resides primarily in the unconscious or subliminal minds of the participants, *e.g.*, in their communal purpose or goal which serves to align their individual vectors with one another, and with them, apparently, the sensing REG unit.

In our first proposition of the M^5 model[1], we timorously suggested a fifth module, termed "the Source" (S). How the "wishing wind" of need, hope, or purpose just proposed as the explicit and implicit organizing factor of mind/matter or mind/mind interactions relates to, or derives from, this Source we leave to the individual reader to consider. We might only note in passing that by any terminology, in any religion or culture, and in any context of meaning, the primary premise of prayer, or of wishing in general, is the invocation of some superior power to align events and experiences into configurations of our preference.

Summary

The salient presumptions and consequent predictions of this schematic supplement to the M^5 model of mind/matter interactions have been drawn from a variety of empirical results of our laboratory program; informal testimony of our operators, experimenters, and analysts; logical extensions and evolutions of prior theoretical efforts; and a certain amount of intuitive rumination, namely:

1. Every conscious experience, and every tangible physical event, can be characterized by two orthogonal properties, arrays of properties, or functional spaces, one of which subsumes its objectively identifiable features, the other its subjective, impressionistic features.
2. These complementary representations are isomorphically rooted in two corresponding but ineffable properties pertinent to the undifferentiated subliminal seed domain proposed in the M^5 model, wherein they function as orthogonal coordinates of an appropriate phase space, labeled s and σ in rectilinear notation, and $\mathcal{S}$ and ϕ in polar notation, respectively.
3. Any element of this subliminal space may be specified by a complex vector $S = s + i\sigma = \mathcal{S}e^{i\phi}$.

4. The palpable (tangible, conscious) manifestations of this subliminal seed may be represented by the product of S with its complex conjugate, $S^* = s - i\sigma = \mathcal{S}e^{-i\phi}$, *i.e.*, by $SS^* = \mathcal{S}^2$, where $\mathcal{S}$ is the magnitude of the complex vector.
5. The interaction of any two seed elements may be represented by the complex vector summation $S_{12} = S_1 + S_2$, and its palpable manifestation by $S_{12}S_{12}^* = \mathcal{S}_{12}^2$.
6. Elementary complex algebra then predicts that in general $\mathcal{S}_{12}^2 \neq \mathcal{S}_1^2 + \mathcal{S}_2^2$, *i.e.*, that anomalous effects may appear in the palpable manifestations of the seed interactions, depending for their relative magnitudes on the phase alignments of the two interacting vectors:

$$\delta_{12} = \mathcal{S}_{12}^2 - \left[\mathcal{S}_1^2 + \mathcal{S}_2^2\right] = 2(s_1 s_2 + \sigma_1\sigma_2) = 2\mathcal{S}_1\mathcal{S}_2 \cos \Delta\phi_{12}$$
$$\text{where } \Delta\phi_{12} = \phi_1 - \phi_2.$$

7. The key to larger anomalous effects thus resides in better alignment and balancing of the two interacting complex seed vectors, *i.e.*, in the matching of their respective "hard" and "soft" components.
8. This alignment is driven by personal or interpersonal need or desire pertinent to the prevailing context or meaning of the palpable situation, but resident in the subliminal psyche.
9. The implications for experimental strategy to achieve larger anomalous effects, consistent with those suggested by the M^5 model, are for the human participants first to establish a stated conscious goal and a basis for resonance with that target, then by some personal technique to release these into their unconscious minds. They then must rely on the inherent capacity for information sharing that prevails between the unconscious mind and the pre-emergent physical dynamics to acknowledge and implement their subliminal desire.
10. All of this must proceed within the multi-statistical nature and consequent essential uncertainties of the composite process, which can be poisoned by intrusive attempts to examine or specify internal objective or subjective aspects prior to their mature external emergence.

In summary, the essence of this M^* model is that any traffic of information between the mental and material domains that flows via the deepest regions of unconscious mind and intangible matter enjoys a degree of freedom not available to more direct routes between conscious mentation and tangible substance. It is a flexibility borne on the inherent unobservability and concomitant uncertainty and indistinguishability of this seed regime, which necessitates an added conceptual and corresponding analytical step in the establishment of palpable reality, namely the bifurcating eruption of the subliminal seeds into the domains of mental experiences and corresponding physical events, as represented in this model by the conjugated vector products.

Like the legendary magical watchmaker who disappears into his private backroom to work his technical wonders, leaving his customers out front simply to state their desires and to marvel at his products, we can only hypothesize, but never directly observe, the esoteric transformations that go on in that forbidden space. Indeed, any attempts to make such observations inevitably polarize the processes into premature tangible events and conscious experiences that preclude further anomalous manifestations of the interactions[4].

Our model therefore is purely epistemological, and primitive at best. It attempts to symbolize these wonders of creation by crude line diagrams, abstract mathematical operations, and strained linguistic metaphors, which merely provide some conceptual vocabulary and self-consistent algebraic relations. But at the end of the day, it lacks any ontological authority, other than to suggest that both objective and subjective strains of information permeate all levels of mind/matter interaction, that mind and matter are themselves epistemological distinctions that fade as one approaches the ontological heart of existence, and that the most basic and ubiquitous of evolutionary drivers, those of need or desire or purpose, can extend their teleological influence even to this depth.

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Appendix I: Multiplicative Model of Seed Interactions

The question is whether representation of the compound seed system as a product rather than as a sum of its two elements would also provide a similar capacity to generate an anomalous cross-term, *i.e.*, whether

$$[S_1 S_2] = [S_1][S_2] \tag{A1}$$

would yield a disparity in its experientials. Performing the complex algebra,

$$S_1 S_2 = (s_1 + i\sigma_1)(s_2 + i\sigma_2) = (s_1 s_2 - \sigma_1\sigma_2) + i(s_1\sigma_2 + s_2\sigma_1) \tag{A2}$$

which has as conjugate

$$(S_1S_2)^* = (s_1s_2 - \sigma_1\sigma_2) - i(s_1\sigma_2 + s_2\sigma_1) \tag{A3}$$

and hence a conjugate product:

$$\begin{aligned}(S_1S_2)(S_1S_2)^* &= (s_1s_2 - \sigma_1\sigma_2)^2 + (s_1\sigma_2 + s_2\sigma_1)^2 \\ &= s_1^2s_2^2 + \sigma_1^2\sigma_2^2 - 2s_1s_2\sigma_1\sigma_2 + s_1^2\sigma_2^2 + s_2^2\sigma_1^2 \\ &\quad + 2s_1s_2\sigma_1\sigma_2\end{aligned} \tag{A4}$$

whereas the product of the individual conjugate products

$$(S_1S_1^*)(S_2S_2^*) = (s_1^2 + \sigma_1^2)(s_2^2 + \sigma_2^2) = s_1^2s_2^2 + \sigma_1^2\sigma_2^2 + s_1^2\sigma_2^2 + s_2^2\sigma_1^2, \tag{A5}$$

which is identical. Hence, there is no disparity to accommodate an anomalous effect.

Likewise, in polar form

$$S_1S_1^* = \mathcal{S}_1^2 \tag{A6a}$$

$$S_2S_2^* = \mathcal{S}_2^2 \tag{A6b}$$

whereas

$$(S_1S_2)(S_1S_2)^* = \left[\mathcal{S}_1\mathcal{S}_2e^{i(\phi_1+\phi_2)}\right]\left[\mathcal{S}_1\mathcal{S}_2e^{-i(\phi_1+\phi_2)}\right] = (\mathcal{S}_1\mathcal{S}_2)^2 \tag{A6c}$$

i.e.,

$$(S_1S_1^*)(S_2S_2^*) = (S_1S_2)(S_1S_2)^* \tag{A7}$$

Again, the multiplicative superposition is distributive, and produces no anomalous cross terms, insofar as its experiential product is concerned.

Appendix II: Vector Representation of Ⓒ/Ⓣ Interactions

While similar vector representations of mind/matter interactions at the conscious, tangible level may be cast, they intrinsically lack the capacity to accommodate anomalous effects. Let any tangible physical event be represented by a vector T, having (real) components t and τ, embodying the "hard" and "soft" aspects of the event, respectively. Let any conscious experience be represented by a vector C, with "hard" and "soft" components c and γ. Presume that the event/experience dyad of any matter/mind interaction can be denoted by the summation vector $E = C + T$, having components $(t + c)$ and $(\tau + \gamma)$

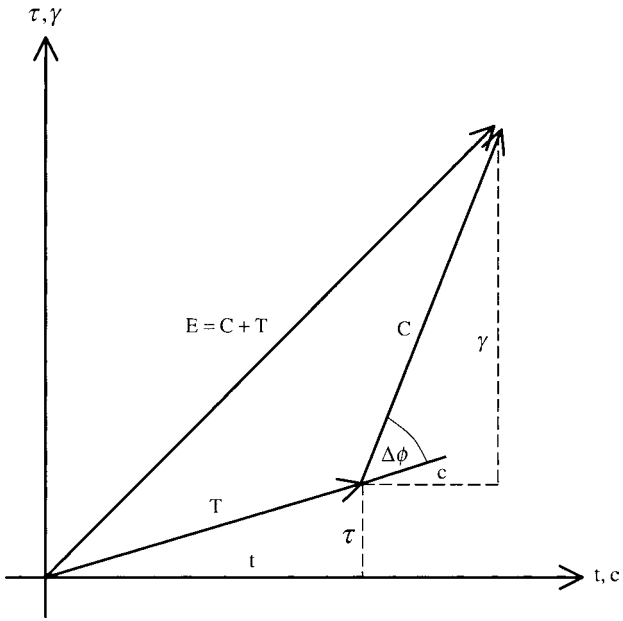

Fig. A-1. Vector representation of the interaction of a conscious mind (C) with a tangible physical event (T) yielding a correlated event/experience (E).

(*cf.* Fig. A-1). Since in the Ⓒ and Ⓣ domains all components are by definition real, there is no need to form conjugate squares to represent experiential quantities. Rather we need only note that the "hard" and "soft" components each compound linearly, *i.e.*,

$$E_h = T_h + C_h = t + c$$
$$E_s = T_s + C_s = \tau + \gamma$$

and hence there is no capacity for representing anomalies in either dimension of these interactions.

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