

Double Vision

For true integral understanding, a dynamic treatment of holon interaction is required that is based on bi-directional logic.

It requires the facility for double vision where the direction of movement – in terms of development - takes place simultaneously in opposite directions.

Three crucial sets of interaction are involved.

Horizontal – based on exterior and interior polarities. These relate to basic objective/ subjective (and subjective /objective) distinctions. In dynamic holistic mathematical translation these are positive and negative with respect to each other (in real terms). ¹

Vertical – based on individual and collective polarities. These correspond to "higher" and "lower" classification and relate to the crucial whole/part (and part/whole distinctions). In psychological terms this involves the complementary functioning of cognitive and affective modes (and affective and cognitive). In corresponding physical terms it involve the continual switching as between response and control (and control and response) patterns of behavior. ²

Diagonal – based on actual and potential polarities. These correspond to fundamental finite/ infinite (transfinite) distinctions (and infinite/finite). Alternatively they refer to phenomenal and empty (and empty and phenomenal) aspects. In both psychological and physical terms this involves the ability to simultaneously switch between opposite polarities at both horizontal and vertical levels and is consistent with the most refined spiritual intuitive experience. ³

Transpersonal Levels

The "transpersonal" levels ⁴ can be most fruitfully understood in terms of the specialized unfolding of this bi-directional understanding.

H1 - the circular level (which would include psychic and subtle realms) - involves specialized bi-directional appreciation of the horizontal polarities.

The transition to H1 entails the development of mirror understanding, which provides the ability to see the reverse truth of (horizontal) dualistic explanations. The various sub-levels and stages then involve continual growth in the dynamic interaction of both positive and negative aspects of experience (i.e. understanding and mirror understanding).

H2 - the point level (which equates well with the causal realm) - involves specialized bi-directional appreciation of the vertical polarities.

Once again the transition to H2 entails the development of - what I call virtual understanding - which now provides the ability to see the reverse truth of all (vertical) dualistic explanations. This enables smooth switching between the whole/part and part/whole nature of holons to take place. (This will be further illustrated in this article).

The various sub-levels and stages of H2 entail continual growth in the dynamic interaction of "real" with "virtual" understanding (where conscious and unconscious interact to a marked extent). ⁵

H3 - the null level (which equates with nondual reality) involves empty understanding. In dynamic terms this is not actually empty of phenomenal activity. Rather dynamic (relative) understanding is now so developed that one can simultaneously switch as between both horizontal and vertical polarities. So phenomena are erased in experience the moment they arise which creates a spiritual intuitive realization (apparently empty of phenomena).

So H3 represents an extreme in terms of specialized intuitive development and integral understanding. Equally however it involves the most refined appreciation of phenomenal relationships (in bi-directional terms) with respect to horizontal, vertical and diagonal directions.

Radial Reality then involves greatly enhanced dynamic experience in the growing interpenetration of linear (asymmetrical) and circular (symmetrical) understanding

Birth of the Imaginary

As we have seen in conscious "real" recognition a holon can appear as a whole/part or alternatively a part/whole. ⁶

In the former case the emphasis is primarily on the whole (which includes the part); in the latter it is on the part (which includes the whole). However consciously choosing either side of a polarity is unbalanced. Therefore when this happens, the unconscious indirectly attempts to project the missing pole into experience.

Let us look at this important interaction more closely.

Experience involves both conscious and unconscious in mutual interaction.

Science however formally interprets reality solely in terms of conscious recognition.

Thus a real object in scientific terms is one that corresponds to a merely conscious interpretation.

This leads in effect to an unbalanced interpretation of holons.

The actual experience of a holon – as we have seen – entails both quantitative and qualitative aspects. But conscious dualistic understanding - which by definition is based on an either/or logic – necessarily recognizes just one aspect (in any given context).

So from a rational scientific perspective, holons – such as atoms and molecules - are interpreted impersonally in terms of the quantitative aspect.

Thus in this context an atom is quantitatively included as part of the (whole) molecule.

However in dynamic terms (quantitative) inclusion requires (qualitative) exclusion. Thus the complementary qualitative aspect of understanding is thereby negated in the unconscious.

This however creates an imbalance in terms of the unconscious (which is based on the balance of opposite polarities).

So it now attempts to redress this imbalance by projecting the negated qualitative aspect back into consciousness.

Thus the (direct) quantitative recognition of the atom always coincides with an (indirect) qualitative recognition (which reflects the projection of the unconscious).

When properly appreciated, this projected element in consciousness serves a vital role as it enables dynamic switching to take place.

Experience thus can change to the opposite qualitative recognition (consciously perceived through affective sense).

So in this context the (whole) molecule is qualitatively included in the (part) atom.

Here the (direct) qualitative coincides with an (indirect) quantitative recognition (reflecting the projection of the unconscious).

Thus in any context, (direct) conscious appreciation of a holon coincides with (indirect) conscious understanding (which reflects the projected unconscious).

Now we can give a fascinating holistic mathematical interpretation of this (indirect) projected element of understanding.

Once again the direct conscious element – based on the positive direction - is interpreted as "real". The indirect conscious element - based on the projection of the negated aspect - is "imaginary" (in holistic mathematical terms).

I will now explain this important fact which has fundamental repercussions for our understanding of reality.

Conscious understanding is one-directional (i.e. one-dimensional).

Unconscious understanding however is bi-directional (two-dimensional).

The (indirect) projected element is based on the negative direction (which is literally negated in unconscious terms).

Thus the (neglected) negative element in the unconscious reflects two-dimensional appreciation. However to be consciously understood it must be expressed in one-dimensional terms.

So the (indirect) projected element of consciousness reflects the conversion of the negative direction from two-dimensional (unconscious) to one-dimensional (conscious) terms.

This represents, in holistic mathematical terms, the square root of a negative quality. It exactly complements the definition of an imaginary number in mathematics (which is the square root of a negative quantity). ⁷

Thus in dynamic holistic terms, understanding is complex (with real and imaginary aspects).

Thus all holons – in dynamic terms – are complex.

If in any context we identify the quantitative aspect as "real", then the corresponding qualitative aspect is "imaginary".

However if we identify the qualitative aspect as "real", the corresponding quantitative aspect is "imaginary".

So we saw that in horizontal terms, holons - relatively - switch as between positive and negative states (and negative and positive)

Now we see that holons switch - relatively - as between "real" and "imaginary" (and "imaginary and "real") states. ⁸

However before looking at the very important implications of the complex translation let us examine vertical switching in the light of this new interpretation.

The Complex Atom

The (vertical) experience of any holon involves the dynamic interaction of its whole and part aspects in both quantitative and qualitative terms.

Let us now translate this interaction in complex terms.

For example the psychological experience of an atom involves both the concept of "atom" and the perception of "an atom" in dynamic interaction.

In cognitive (scientific) terms we can view this interaction in two ways.

Real (qualitative) + Imaginary (quantitative) – in impersonal terms.

The "part" perception and "whole" concept are viewed as "lower" and "higher" respectively. The "lower" perception is then transcended and included in the "higher" concept (i.e. the part is included in the whole). In this context, the meaning of the "lower" perception (of "an atom") is derived primarily from the "higher" concept (of "atom").

This approach is the basis of theoretical science. Here the meaning of "lower" empirical data is primarily derived through the interpretative lens of "higher" conceptual constructs. In other words the "lower" parts are deduced from the "higher" wholes.

Strictly speaking, in scientific terms concepts are qualitative and perceptions quantitative respectively. The concept of "atom" is therefore - in direct terms – qualitative whereas the perception of "an atom" is quantitative.

Thus here the qualitative aspect is experienced as "real" and the corresponding quantitative aspect is "imaginary".

Real (quantitative) + Imaginary (qualitative) – in impersonal terms

The previous position is reversed in experience. The "higher" concept of "atom" is now made immanent and included in the "lower" perception of "an atom" (i.e. the whole is included in the part). In this context the meaning of the "higher" concept is derived primarily from the "lower" perception.

This approach is the basis of empirical science. Here "higher" conceptual constructs are derived from an extensive knowledge of the "lower" empirical data. In other words theoretical constructs are induced from the empirical data. ⁹

Thus the quantitative aspect is now experienced as real and the qualitative as imaginary.

In affective (artistic) manner we can also view the interaction in two ways.

Imaginary (qualitative) + Real (quantitative) – in personal terms

Here the focus is on the "lower" perception of atom, which includes the "higher" concept. In other words the quality of "atomness" is made immanent and fully included in the perception of the atom (which is now perceived in its personal aspect as unique). ¹⁰ Once again all of the whole is in the part.

The quantitative aspect is now real (in a unique personal sense) and the qualitative is imaginary.

Imaginary (quantitative) + Real (qualitative) – in personal terms

Here the focus is on the "higher" concept of the atom, which includes the "lower" perception. In other words the perception of "the atom" is transcended and included in the "higher" concept of "atom" (which is perceived in affective sense terms).

Here the qualitative aspect is real and the quantitative aspect imaginary.

The actual experience of any holon necessarily entails this dynamic conscious-unconscious interaction. These have quantitative and qualitative characteristics in both affective and cognitive terms. Therefore adequate translation requires that we reflect these various aspects.

From a vertical perspective, this interaction is appropriately translated in complex terms as the continual switching between real and imaginary (and imaginary and real) states.

Nature of Holistic Mathematics ¹¹

Holistic Mathematics essentially involves a dynamic experiential approach, which clarifies the deep philosophical meaning inherent in mathematical symbols.

When understood in this light, mathematics acquires enormous potential as a true synthetic - rather than an analytic - tool and serves as the precise scientific basis for an integral approach to reality.

All mathematical symbols and relationships - from an integral perspective - have a direct relevance to reality (both in its quantitative and qualitative aspects) which are now understood in dynamic complementary terms.

This is a very important statement with – potentially – immense consequences.

The reason why this is not apparent in terms of (conventional) mathematics is due to its limited nature of translation (which greatly restricts its range of applicability). ¹²

In general terms, the importance of mathematical symbols, from an integral perspective, is directly related to their corresponding importance in conventional analytic terms.

This article is drawing attention to the integral importance of the mathematical notion of the "imaginary".

Nature of Space and Time

This complex interpretation of holons is the basis for the integral translation of the four dimensions of space-time (which in dynamic terms exactly corresponds with the mathematical interpretation).

To express these four dimensions (in reduced linear language) we obtain the four roots of unity. This yields two real roots (+ 1 and – 1) with positive and negative directions and two

imaginary roots ($+i$ and $-i$) again with positive and negative directions.

We can express the four dimensions of space-time in terms of either space or time.

Thus in terms of time, there are two real dimensions with positive and negative directions. Likewise there are two imaginary dimensions of time with positive and negative directions.¹³

We can equally express the four dimensions of space-time in terms of space. The conversion between space and time is simple. In dynamic terms what is real in time is imaginary in space (and what is imaginary in time is real in space).

So with this conversion we have equally two imaginary and two real dimensions of space (with positive and negative directions in each case).¹⁴

In the integral translation there is full complementary as between physical and psychological aspects. Thus psychological experience of reality also takes place in complex space-time.

Thus from one perspective we psychologically experience four dimensions of time (two of which are real and two of which are imaginary).¹⁵

From the opposite perspective, we experience four dimensions of space (two of which are imaginary and two of which are real).

Thus actual reality (physical and psychological) keeps switching – in dynamic terms – as between on and off states in both real and imaginary terms.¹⁶

Interpreting the Universe

Conventional science interprets the universe in a very reduced fashion.

This is due to lack of an adequate means of translating the nature of dynamic interactions.

Thus in this scientific view, the (whole) universe is viewed quantitatively as the sum of its parts. From this asymmetric perspective the parts (such as atoms, molecules, cells etc.) are included in the whole; however the (whole) universe is not included in these parts.

From a dynamic perspective this is very misleading.

The parts of the universe are included in the whole (transcendence); equally however the whole of the universe is included in each part (immanence).

This can only be properly understood in dynamic relative terms where the interaction of the quantitative and qualitative aspects of holons is recognized.

Thus the atom is quantitatively contained in the (whole) universe; however the (whole) universe is qualitatively contained in the atom.

This can be appropriately translated in complex rather than real terms.

Thus if we identify the whole as real then the part (to which it relates) is imaginary.

However if we identify the part as real, then the whole to which it relates is imaginary.

In this way the part is in the whole, and the whole is in the part.

In other words all holons have both personal and impersonal aspects (which dynamically interact). Conventional science gives a very distorted view of this interaction as it attempts a reduced translation in quantitative (impersonal) terms!

Properly understood, the universe - in holistic mathematical terms - is a complex organism that involves the continual interchange of its real and imaginary aspects. ¹⁷

Conclusion

We have looked briefly at the bi-directional nature of whole and part (and part and whole). In holistic mathematical terms it is translated in complex (rather than solely real) terms.

The four-dimensional complex interpretation of reality is the starting basis for an "Integral 2" interpretation of reality.¹⁸

NOTES

1. In holistic mathematical terms this dynamic structure corresponds to the number 2 i.e. 1^2 (in the circular system). Its reduced linear translation involves the square root of unity which yield opposite poles i.e. +1 and -1 which geometrically are represented (within a circle) as the horizontal line diameter stretching from the center in opposite directions (to the circumference).

The positive direction of experience is represented by conscious recognition.

The corresponding negative direction is represented by unconscious recognition (i.e. mirror understanding). In ascetic spiritual terms this is developed through purgation and sometimes referred to as "unknowing" and "learned ignorance". It serves a dynamic role enabling ready switching as between opposite (horizontal) poles of experience.

So if in conscious terms I identify with the exterior (objective) direction as positive,

then mirror understanding – which is negative - is necessary to enable me to switch to the corresponding interior (subjective) direction. This is then posited in conscious phenomenal terms. So once again mirror understanding is necessary to enable the switch back to the exterior (objective) pole.

Without proper development of mirror understanding, understanding tends to become unduly rigid becoming excessively identified with either the exterior or interior pole.

When however mirror understanding is very refined, one does not identify with either pole (except in a relative sense). Thus understanding becomes very dynamic involving enhanced interaction of both poles.

2. In holistic mathematical terms this dynamic structure corresponds to the number 4 i.e. 1^4 (in the circular system). Its reduced linear translation involves the four roots of unity which geometrically are represented (within a circle) by both the horizontal and vertical line diameters stretching from the center in opposite directions (to the circumference).

In mathematical terms, imaginary (as opposed to real) numbers represent the vertical lines.

The very purpose of this article is to show that that this once again has a precise holistic mathematical interpretation. Thus the unconscious intervenes in vertical – as well as horizontal – fashion through what I refer to as virtual understanding. This understanding is essentially projected from the unconscious (in imaginary phenomenal form) and enables dynamic switching to take place as between the whole/part and part/whole nature of holons. (This has a fascinating counterpart in sub-atomic physics where virtual particle is inseparable from the dynamics of real particle activity!)

I have quoted Marie Louise von Franz before in relation to Jung's work. "Jung devoted practically the whole of his life's work to demonstrating the vast psychological significance of the number four...."

Jung as we know was very interested in mandala patterns, which he saw as symbols of psychological integration. Many of these are based on circular four-fold symmetrical figures. We can now see that the precise reason for their significance lie in the circular interpretation of the number 4 (corresponding to the holistic mathematical interpretation of the four roots of unity).

Quite simply this provides the underlying symmetrical four-dimensional structure of reality (which is the appropriate basis for integral understanding).

I have always maintained that Jungian thought lends itself to holistic mathematical interpretation. Jung - I believe - would have readily appreciated this translation.

3. In holistic mathematical terms this dynamic structure corresponds to the number 8 i.e. 1^8 (in the circular system). Its reduced linear translation involves the eight roots of unity, which geometrically are represented (within a circle) by the horizontal, vertical and diagonal line diameters stretching from the center in opposite directions (to the circumference).

The diagonal lines can be given a fascinating interpretation. Indeed they are null lines with a numerical value = 0). So in holistic mathematical terms they directly correspond with the underlying empty structure of nondual reality.

4. 4. In dynamic circular terms prepersonal and transpersonal are necessarily complementary. So when
5. I use inverted commas, I am implying this circular interpretation (i.e. where transpersonal dynamically implies prepersonal).
A one-directional asymmetric linear approach to development is especially misleading as a means of portraying either the beginning or end stages.

The neonate without any true development is literally all over the Spectrum in a terribly confused manner. Thus to identify this simultaneous (circular) access to all stages (albeit in such a confused manner) as the first stage – in linear terms - is somewhat inappropriate.

From one important perspective, "prepersonal" development can be looked on as a process through which (confused) access to all levels of the Spectrum is gradually eroded.

Thus with specialized personal development, dynamic access to all other levels (prepersonal and transpersonal) is greatly reduced so that one indeed is now confined largely to just one level. This helps to explain why so few go on to achieve true authentic development (which requires simultaneous mature access to both prepersonal and transpersonal levels).

5. Modern physics now shows that what was thought as empty space is full of dynamic virtual particle activity. So my own treatment of H2 (the causal realm) greatly complements this physical behavior, with considerable emphasis – in psychological terms – on the role of "virtual" understanding.
- 6.
6. A "real" phenomenon is conventionally defined in terms of what is experienced in a directly conscious manner. Thus for

example when I look at a phenomenon e.g. a flower from an aesthetic or rational perspective, it is defined in experience as "real". However this confuses two very different types of appreciation.

7.

7. The mathematical notion of the "imaginary" in its deepest philosophical sense is closely related to the literary meaning (which is directly concerned with unconscious rather than conscious meaning). It is remarkable how the very choice of terms to define mathematical number types so often provides a direct clue to their deeper philosophical significance. We have already made this connection explicit in the case of rational, irrational and negative numbers!

8.

8. This must be understood in a relative sense. Cognitive and affective understanding both have

9. conscious "real" aspects. Equally however they both have unconscious "imaginary" aspects.

So in dynamic terms when one aspect - say the cognitive - is directly conscious in experience in "real" terms, the other aspect (affective) is indirectly conscious in "imaginary" terms.

10. 9. In his "Marriage of Sense and Soul", Ken Wilber tends to identify "narrow" science with its empirical aspect. However this science equally has a theoretical aspect with a subtly different rationale. Proper recognition of both aspects leads to the appreciation that science is necessarily identified with the Left-Hand as well as the Right-Hand quadrants.

11. With empirical science the qualitative is indeed reduced to the quantitative aspect.

However with theoretical science the quantitative strictly is reduced to the qualitative (conceptual) aspect. Thus quantitative and qualitative aspects are reduced in terms of each other.

So, properly interpreted the disaster of modernity is not so much that qualitative aspects are reduced to quantitative but that – in scientific terms - quantitative and qualitative are reduced in terms of each other. This in turn reflects the failure to appreciate the need – in dynamic terms – for a synthetic as opposed to a merely analytic method of scientific translation.

10. With sufficient development, the "imaginary" aspect - which reflects the intuitively refined unconscious - can lead to an advanced experience of spiritual immanence.

12. Thus in Blake's famous line "To see a world in a grain of sand", the grain of sand is identified in "real" quantitative terms. It is the "imaginary" projection of the spiritually refined unconscious which imparts the quality of wholeness to the experience.

In the same sense the "whole" universe is contained in a single atom. However this artistic is very different from the scientific aspect.

The spiritual quality of "imaginary" (projected) consciousness can vary greatly. When conscious understanding is rigid, the opposite aspect is also rigidly negated (i.e. repressed) in the unconscious.

The projected element then takes place in an involuntary manner attaching itself to conscious objects (and is very much misunderstood). With sufficient development of mirror understanding, projections from the unconscious take place in a very refined manner and are not readily confused with conscious activity.

13. 11. I am very conscious here that the term "Holistic" reflects a certain imbalance. (suggesting a transcendent rather than an immanent bias). I would personally prefer to use the term "Integral Mathematics". However integral is used in conventional mathematics in a different limited sense so this could cause unnecessary confusion.

14. However even with integral translations a valid distinction can be drawn as between the deductive (transcendent) and inductive (immanent) approaches.

I am chiefly concerned here with the basis for a theoretical synthetic approach and concentrating therefore on the dynamic holistic meaning of mathematical concepts.

There is of course an equally valid role for an empirical integral approach to mathematics where "higher" synthesizing concepts would emerge from the study of specific mathematical applications.

15. 12. Ken claims in "Marriage of Sense and Soul" that "no one has seen an imaginary number (such as the square root of -1) running about in the sense world".

16. I would not agree. It is very much a matter of translation. Indeed from the perspective I am offering, one cannot sensibly perceive a holon without i (the square root of -1) "running about". This is inevitably involved as the projected counterpart of all "real" conscious understanding and is therefore inherent to the

understanding of any entity.

17. 13. The real directions of time correspond to the (horizontal) conscious real existence of holons as regards their exterior and interior directions. Thus if movement in regard to the exterior direction is positive in time, then movement with respect to the corresponding interior direction is – relatively – negative.
18. The imaginary directions of time correspond to the (vertical) unconscious (or projected) imaginary existence of holons as regards their whole and part directions. Thus if movement in regard to the whole direction is positive in time, then movement with respect to the corresponding part direction is negative.
Thus all holons in dynamic relative terms move forward and backward in both real and imaginary time.
19. 14. Again from a four-dimensional integral perspective, in dynamic terms all holons move forward and backward in both real and imaginary space.
20. 15. If the conscious exterior direction of a holon is experienced in positive "real" time, then - relatively - the exterior direction is in negative "real" time.
21. Likewise if the unconscious (i.e. projected conscious) direction of the whole aspect of a holon is experienced in positive "imaginary" time then the part aspect is experienced – relatively – in negative "imaginary" time.
By simply switching "real" to "imaginary" and "imaginary" to "real", a similar interpretation applies to the four-dimensional experience of space.
22. 16. A fascinating problem for a comprehensive radial translation of reality is the need to establish the precise connection as between the synthetic (symmetrical) and analytic (asymmetrical) interpretations of space-time.
23. The asymmetrical model is necessarily based on a three and one interpretation of space-time.
However the standard model represents one of just four equally valid asymmetric models
Thus reality can be interpreted from an analytic asymmetric perspective in terms of three (real) dimensions of space and one of time. This is the standard interpretation.
However equally it can be interpreted in terms of three (real) dimensions of time (and one of space).

(Whereas our conscious perceptions take place in three dimensions of space and one of time, corresponding concepts take place in a reversed framework which - relatively - involves three dimensions of time and one of space).

However reality can also be analytically interpreted in terms of three (imaginary) dimensions of space (and one of time), reflecting the projected nature of quantitative phenomena.

Finally it can be interpreted in terms of three (imaginary) dimensions of time (and one of space) reflecting – relatively - the projected nature of qualitative phenomena.

17. The various hypotheses regarding the existence of many worlds in modern physics reflects the lack of a proper dynamic perspective. We are already living in "many worlds". In other words each unit of life at whatever level is "a world" in dynamic interaction with other "worlds". So there is already the interaction of the one world with the many and the many with the one.
24. The "many worlds" hypothesis of quantum mechanics can be used dynamically to give a fascinating interpretation of human existence. When a person identifies oneself as an individual it creates a unique world (not shared by other individuals). In social terms it creates a common world (shared by all). The (unique) individual aspect dynamically negates the (universal) social world; likewise the social negates the individual world. So in human terms individual and social aspects of personality ceaselessly interact in the continual interplay of the one and the many worlds..

18. Once again this corresponds with the bi-directional understanding of H2 (the point level) which corresponds to the causal realm.