

[Note: Late addition essay meant for focus issue 1(5),
Time & Consciousness: Two Faces of One Mystery?]

Exploration

'Conventional time t' versus 'Rhythmic Time T' (Two Faces of One Mystery)

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Abstract: Here is described a second form of time. Here, it is also suggested that 'ALL (real) TIME IS NOW TIME,' otherwise past and future temporal concepts of the two types are scalar labels called 'Conventional timetags' and 'Rhythmic Timetags.' Additionally one's mind is described by a new, seemingly important, dynamic concept called an 'Essos' (pronounced Eee-sos) and containing both one's 'Conventional Now' and one's 'Rhythm Based Now.' It is suggested that we use an upper case 'TIME' for the sum of these two mental concepts. Described also is the seemingly very important 'Mental Vector Process' or 'MVP' which appears as the Most Valuable Player, for all living organisms, in The Game of Life. The book preparation, entitled *Dancing With Nature*, from which this paper is a highly edited form, suggests the merging of the science of physics with the sciences of biophysics and biochemistry.

Key Words: Conventional time t, Rhythm Based Time T, TIME or (t + T), timetag, Timetag, mind, Essos, Now, MVP, biophysics.

Introduction

'Conventional time t' is displacement divided by velocity, or space divided by speed. Throughout this research we use both an internal upper case 'T' and closed words (such as 'onTime') to designate a newly discovered temporal form called 'Rhythmic Time' or 'Rhythm Based Time, T or RBT.' Such 'Rhythmic Time' is defined by: "*a mental perception of lateness relative to an agreed, biophysical, cyclical concept of synchronizaTion (or onTimeness) between two or more minds.*" 'Conventional time' is well known to physics. "Rhythm Based Time" is both biophysics and a foundation of a newly discovered 'Rhythm Based Communication, RBC,' which has now been studied between humans and 'The Great Whales,' eagles, moose, fox and other unstressed animals. Such is explained in a book entitled *Dancing With Whales* (Creative Publishers, St. John's, NL, CA) and is soon to be presented with much more detail, and data, in a sequel *Dancing With Nature*. We hereby join this latter research story (methods, materials and results) with ocean expeditions from Trinity, Newfoundland, aboard the *Ceres*, a large rigid-hulled inflatable with hull mounted underwater transmitters.

Samples from *Dancing With Nature* (adventure plus new knowledge)

"T minus one minute and counting. Gentlemen please place your chair backs and tabletops in the upright position for takeoff! A-OK Nick, castaway. T minus zero. Up slow to half speed."

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"What was that upright stuff?" asks Edward, a new British student.

"Just Dad's attempted humour Ed," says Nick, with a smile.

"Practice bearings everyone: One o'clock - Admiral's Island; four o'clock - ruins of an old whaling station; eight and eleven o'clock - church steeples; two o'clock - Fort Point light."

We are cruising at 30 knots on a glassy calm, spectacular harbour. A slow practice turn to starboard is announced and the *Ceres* leans gently into the curve like a Formula One racing car on a sharp, 90 degree, banked bend. Down speed to zero. Engines off. The 'sound of silence.'

"Welcome to 'Admiral's Island Airport,' home of about 100 pairs of Arctic terns."

In a low voice, Nicholas describes their flight patterns and sounds, to Alex, Hans, Edward and Mark, all sitting astern. Mark is a young, bright, marine mammal student from New Zealand. Simultaneously I do the same for Elliott, George and two students sitting forward of the console.

"Notice the cannons at two o'clock, left by the British to protect the harbour mouth. There are others, tagged by our historical society, just ahead under water."

"Up slow to half speed." A moment passes while Nick and I search the horizon for whale blows. "The rock statue on the right was named the 'naked man' hundreds of years ago and when we tried to get it changed to the 'naked person,' in honour of all liberated women, many fishermen refused because there's a 'naked lady' on the other side of this point. It was aptly named the naked god, before the first European settlers."

We stop in sheltered waters.

"Bald eagle, two o'clock, on top of the largest pine tree," announces Nick. "It's an adult. You can tell from the snowy white on the tail and top of its head."

"We are in 'Green Island Tickle' and between eight and ten o'clock live seven species of seabirds, but no eagles!"

"And a 'tickle' is?" asks Charles, a biophysics graduate from the University of British Columbia, in Vancouver, western Canada.

"A Newfoundland term for the body of water, generally between a peninsula and an island. It was named, presumably because that is where a boat could 'tickle' its bottom, or sides!"

"Hey Dad," Nicholas, whispers in my ear from the mast lookout position, "there are seven humpbacks blowing near the cliffs at Pigeon Cove."

Right thumb and forefinger close subtly together, into a 'circle signal,' responding confidentially to this good news.

Up slow to three quarter speed, in along the spectacular shoreline of hills, harbours, anchorages, well marked fishing nets, water falls and eagles, we proceed, while finding the calmest waters.

"Harp seals at eleven o'clock, just watch them dive together!"

About 50 seals all look at us until their leader communicates some sort of a synchronous dive concept. I wonder if it was a signal; one could expect that, with a high stress situation. Or was it a rhythmic prelude associated with the beat of a common biorhythm? One day soon humans may study both types of communication for many an organism throughout the biosphere.

"Range 5000 meters, bearing twelve o'clock, seven humpbacks – ahead," I shout.

"Assuming that Nicholas first saw the whales, from high up on the main mast," Hans comments to Alex, "Good Lord, that young man must have fantastic sight."

We pass a minke whale heading at high speed back towards Trinity.

"The way that Nick identified the humpback whales at almost four miles was to watch for the low contrast blows against the dark cliffs behind. Polaroid glasses and a cap with a brim are a help. You'll find lots of such caps in the aft port locker, or you can hold your hand above your eyes to shield the glare and thus differentiate the blows."

Hans and Alex unpretentiously don their sunglasses.

"It's Ida's group," shouts Nick from on high.

"Blow, and another at twelve o'clock, range 3000 meters, feeding along the capelin spawning beach at Pigeon Cove. More blows; do you see them, Elliott?"

"That time I believe so," comes the reply.

"That time definitely," say together, George and Jay, the latter a second New Zealander, specializing in acoustic mammal behaviour.

"Range a mile, bearing still straight ahead. Down slow to half speed."

"Sounding dive, large tail up - and - down. That's Andrew. I could see his large black dots on the underside of his right fluke," announces Nicholas.

"Come on down Nick, we'll start the computer program. We should use an 'alpha concept' of one minute as the whales are all in shallow water. Set your watches everyone. Starting with the next countdown we will be transmitting two second, underwater sound pulses every minute."

"Six whales are lunging after capelin along the shoreline and another is closer to us in deeper water," Nicholas broadcasts above the steady, moderate purring of the two, enormous, Honda, four stroke, 'super' engines.

"Down slow to dead slow," and the in-air sounds reduce to a low purring so that calm voices are all that's needed for the onboard discussions.

"5-4-3-2-1-mark!" shouts Nicholas. "First signal out." One minute later, second signal out.

"Starboard engine turned off, at the mark, Nick," as he had perceptively already started to enter such a signal as a comment on the computer data base. With one engine off and the other in dead slow even the calmest talk is heard from the forward observers.

"The third signal is coming up, watch any or all of the seven whales for synchronization."

There follows another countdown to 'mark' and at that very moment we all see a huge blow on the closest whale.

"It's Andrew," declares Nick.

"Synchronization, one o'clock, 1,000 meters."

"Did you suspect that 'sync.' Dad, or just feel it?" asks Nick.

"The latter. What's the stress program reading?"

"Amber stress light folks; situation looking good," states Nick to all on board.

"Switch to the passkey program Nick and give a ten second warning before transmissions please."

Asking Alex and Hans to watch the coming manoeuvre, *Ceres* gently turns toward Andrew. Explanations about the next transmission are made, the 'first message signal,' which will be 90 seconds delayed in the 'offTime' window. Elliott and George glance at their watches.

"Hey, 'offTime,' that's what you called – one of your supposedly universal variables!" mentions Hans.

"Correct, it's actually our variable number three of ten, Hans."

"Warning for the first message signal, Dad," confides Nick.

"Thank you." Quickly, a second pinger, tethered to the console, is activated. It'll be tossed forward to hit the water precisely at the start of the main computer controlled transmission. Hans comes closer to observe.

"Down one stop on the main sound intensity; log that please."

"5-4-3-2-1-mark, first message signal, 'gamma one,' we call it," announces Nick. "It's lower in intensity by half the output power, or three decibels."

"Estimated location: 700 meters at twelve o'clock. He's probably resting on the bottom as it's only 150 meters deep where Andrew was last seen."

"Lunge feeding near the shore at two o'clock," reports Nick.

Capelin (a small fish), literally fly from the water surface just behind a lunging, hungry humpback and then a partner whale emerges with mouth unbelievably wide open and water rushing from the back sides of its mouth. Gulls hover over the second whale, which they must know is the main feeding one. They literally pluck the fish from the air without landing. The first animal, although probably just as hungry, has forced the fish into the second whale's mouth using its long white inside flipper. We then see these same two whales change places in a following lunge feeding incident in which case we have a primary example of mutually, 'cooperative feeding.'

"Andrew knows our 'passkey' so watch for synchronization on the coming, 'second message signal.' This one could be good for you to photograph, George."

"Warning on 'gamma two.' Dad," whispers Nick, as he has remounted to his mast position and he gently taps me with a boot tip, a practiced, concentration and focusing procedure.

"My dear Hans, will you take over on this new transmitter. It should go into the water on Nick's 'mark' but you should haul it out between two and three seconds later."

"A-OK as Alex would say! Hey! That's poetry!" replies Hans jubilantly.

"5-'flipper up'-4-3-2-and, down,' right on the mark for gamma two synchronization!" hollers Nick, with excitement in his voice. "We've green light, low stress conditions and we've a potential, 'reciprocal, overlapping greeting,' one of the terrific thrills of these new animal communication methods."

"The third message component will be 'onTime.' That's variable number one. Don't expect Andrew to signal 'onTime' but you can expect a signal in the 'offTime' window, 28-32 seconds after our transmission."

A ten second warning occurs, which Nicholas communicates via foot tap only! Hans seems ready. Nick announces that Andrew is between ten and eleven o'clock and then he shouts the countdown to 'mark.' This is the 'third message signal,' we call it 'alpha one.' Nick soon reaches down to point toward the expected bearing and then to steady George, by gently holding his shoulder.

"OK everyone, here comes Andrew's second signal. In 5 seconds -3-2- 'FULL BREACH'!!!"

Smash, just after the zero count, and as the 50 ton whale hits the water about half a second late, George is still clicking shots of the enormous splash! "I got the whole sequence! Great guide work Nick and thanks a lot for helping me to aim and keep steady," reflects George.

"We have finished our greeting or passkey. Next it'll be Andrew's turn to send his third signal which I predict will be a normal blow." [For actual photographs of such whale message signals, please refer to the '[Ocean Contact](http://www.oceancontact.com/)' section of the web pages at www.oceancontact.com/.] "Ten second warning everyone, 5-4-3-2-Blow, one second early," says Nick, (please see Appendix). By now we are nearly beside Andrew so *Ceres* goes to silent ship exactly on the next 'alpha time,' (by definition, the rhythmic time centered in the 'onTime' window).

"Program for the interrogative of our rhythmic concept for fourth year capelin, Nick. Do you want me to look up the declarative in our dictionary?"

"I've got it here in memory, yes, it's: 'late-offTime-late-early.' So I just reverse the direction of our rhythmic time from clockwise to counterclockwise to get: 'early-offTime-early-late,' right maestro?" asks Nick.

"Yes indeed, carry on. But I'll turn down another stop on the sound transmission intensity if you'll log it, please."

It's amazing to see the sudden fascination in Alex and others at this reasonably routine guide conversation, which must be quite novel for them. This may now well be, in fact, a coming experimental demonstration of the quintessential communications discovery of our lives!

"How can you be sure that Andrew, the whale, both knows and remembers your concept for fourth year capelin?" questions Alex.

"Here we have Ida's group and they all know this concept. They learned it by conditional response when we always tested the capelin age, and then delivered the proper message, wherever they were feeding. They know many other rhythmic concepts as well, and they actually teach and frequently remind us to remember our own rhythmic concepts from past contacts."

"Ten second warning, Dad," says Nick and his computer conducts the music of the next four transmitted signals.

"Now watch for a double signal in either of the 'onTime' or 'offTime' windows."

"Review that again Peter, it is hard to keep track of all these signals," says Hans.

"The 'onTime' window, variable number one is now from 58 to 02 seconds on this master watch. The 'offTime' window is variable number three and is set from 28 to 32 seconds. It occurs every time, in this case, that the sweep second hand makes, a one minute revolution or one 'alpha rhythm.' Recall that an 'alpha rhythm,' measured in cycles of 'Rhythm Based Time' per unit of linear time is, in this case, one revolution per one minute. It is purposefully designed by us to exactly match the movement of the sweep second hand on your watch. Later, for eagles, the 'alpha rhythm' will be one cycle of 'Rhythm Based Time,' per twelve seconds. Let's watch for Andrew's answer; it can come now on any cycle." ('LateTime' is 13-17 seconds; 'earlyTime' is 43-47 seconds.)

"Look up! 'Lob tail'- Smash, 'Lob tail' - Smash," Nick reports and records, while George photographs.

"A distinct double signal in the 'onTime' window meaning the affirmative!"

"And in simpler English doc?" asks Edward.

"We asked the whales if these capelin are four years old and they answered yes!"

"And in perhaps more philosophic terms?" asks Alex.

"We have demonstrated the interrogation of Nature under low stress conditions using what we consider to be a genuine communication system of Nature. For such cases we have no evidence of any replies other than with honesty and altruism."

"Well that certainly makes it different than language, wouldn't you agree, Alex?" asks Edward.

"Wouldn't you say that evolution with its survival of the fittest is a natural type of war?" questions Edward.

"Agree, but Peter's evidence so far shows that the honesty of altruism is a type of peace that is the opposite of war, just as 'true altruism' is so different from a business deal," responds Alex.

"Nick can you program the group size, how many, message please?" But Andrew is hungry and he is soon seen inshore with the other feeding humpbacks.

"Watch everyone, Andrew, our past communications leader is on a higher stress feeding break, but another should replace him and continue the identical rhythms and communications sequence."

"This, I've got to see," murmurs Elliott to George.

"Ten second warning, Dad," says Nick again, and his computer conducts more music of the next four transmitted signals.

Then for Elliott, a miracle of miracles, as Ida emerges from the feeding whales and with a single synchronized tail slap and a 'lateTime' left flipper slap, answers the question with the number nine!

"Ida, while ending her meal, must've received a message expressing Andrew's hunger. We believe that during our 'Rhythm Based Communication' encounters, all nearby whales are listening but only one is a whale-to-human communications leader. When Ida arrived near the *Ceres*, she took over that position and answered our often-asked question with a tail slap followed by a left flipper slap. We have previously taught these animals, by conditional response, that a tail slap

represents the number ten and a left flipper slap represents a minus one. So the answer is nine. For your interest in our instructed counting system, a right flipper slap represents a plus one.”

“But one tail slap is then the signal ten, not a rhythm,” perceptively states Alex.

“Exactly, you have seen how signals and rhythms can be juxtaposed in human animal communications. Synchronized signals, as you saw, can contain both ‘Signal Based Information’ and ‘Rhythm Based InformaTion’.” (Please note the important use of the upper case “T” in the latter.)

Let me remind everyone that so far we have only studied human-animal communications using ‘RBC,’ but that we are still a fair ways away from studying whale-whale or animal-animal messages. The key difference is that in the former we create the rhythm base, but in the latter there most probably exists one or more rhythms, more natural to the organisms involved. The logic of this last statement is that various confidential combinations of rhythmic bases could make messages private, an important advantage in evolution. When the day comes that organisms share with us their confidential rhythms, humans will have finally and truly joined into the innermost nature of Nature.”

“I understood that you now believe there are nine whales in this group,” says Charles.

“I do. Look for the missing two,” (which are later found at Eagle Beach).

Student Seminar - Simple Biophysics

Students are assembling in the *Eagle Room*. “Attention s’il vous plait! Merci. This student meeting will try to explain new theoretical concepts about the past, the present and the future. I’ve already ordered the hot drinks so now’s our chance for good communication, good questions and good application to your various experiments, and, quite possibly to both your remaining life, as well as your very inner being.”

“Do you mean to infer that these discoveries in communications may improve our careers as well as our total well being?” asks young Jason.

“Precisely! Let me explain. Animals, other than humans, do not possess what is generally thought of as semantic language. Apparently, the evolutionary selection pressure has not existed in order for them to develop either a language or detailed thoughts of future plans or future creativity. There are no significant cave paintings by non-human species! Animals have memory but their conscious thought ‘seems’ always in the present, and of the past. Migratory patterns, such as ‘north to feed, south to breed,’ say for our North Atlantic humpback whales, seem like generalized futuristic thought processes, but they are more likely caused by a genetic trigger based on internal biochemistry, external conditions, or environmentally based learning. But we now define the concept of ‘future,’ to consist of detailed plans and foresight such as are found, so far, only in humans. One’s past is related to memory and in molecular form memory seems found in all living organisms.

“Now let’s discuss: ‘A New Logic of an Old Concept,’ that of: ‘TIME.’ And in particular, I’ll mention the mystery of biological aspects of the physical time variable, often represented in your past science courses simply by the lower case symbol t. Using a definitive definition of logic, the following opinions may approach principles governing correct or reliable inference, involving the human enigma of what seems to be an improved temporal theory.

“There now appear to be two temporal types: a) Linear or cyclical ‘Conventional time, t or Ct,’ also designated as ‘time’ with the usual lower case t, and, b) Cyclical ‘Rhythm Based Time, RBT, or RT,’ in contrast designated as ‘Time,’ spelt with an upper case ‘T,’ or by the symbol ‘T’ alone. Additionally we suggest the word ‘TIME,’ with all upper case letters, be used to represent a sum of t + ‘T’.

“With this convenient notation we have the need for new words, with an internal upper case ‘T,’ such as: ‘duraTion, synchronizaTion, communicaTion,’ and seemingly the immensely important ‘informaTion,’ as well as and including closed words such as: ‘onTime, lateTime, offTime, earlyTime, RhythmicTime’ AND the equally important ‘NowTime,’ or ‘NowTIME’, where, as before, ‘TIME’ = t + ‘T’, all representing the incorporation of cyclic ‘Rhythm Based Time, T or RBT,’ or simply ‘Rhythmic Time’.

“Important differences between these two temporal types a and b, are:

“1a. A duration of ‘Conventional time, t or Ct’ is displacement divided by velocity where such displacements and velocities are external to a measuring, cyclical, working clock, or if the clock is linear (as for example a water clock), then such a linear clock must match, on a one-to-one basis, the said cyclical clock.

“1b. A ‘duraTion’ of ‘Rhythm Based Time, T or RBT’ is displacement divided by velocity where such displacements and velocities are internal to a measuring, cyclical, working clock, or are associated on a one-to-one basis with the internal rhythms of such a clock, as for example an age.

“To clarify these two novel statements, our Earth is a measuring, cyclical, working clock and if one remains in a stationary location then one’s cyclical velocities are associated with ‘duraTions’ of ‘T.’ If however, one moves, then any travel time is in the normal durations of t. In communications science, if one synchronizes one’s master, internal, biological clock, one’s ‘Suprachiasmatic Nucleus, SCN,’ to any exterior ‘Rhythm Based Time’ cyclical, working clock then the resulting ‘duraTions’ become essentially ‘internal’ to such a cyclical, working clock and such becomes a potential starting point for ‘Rhythm Based Communication, RBC.’

“2a. ‘Conventional time, t’ is unidirectional, counting only in the direction from the present to the future, as in radians from 0 to 2π to 4π , or, in degrees, from 0 to 360 to 720.

“2b. ‘Rhythm Based Time, RBT’ or ‘RhythmicTime T’ may have a sign change at π radians (180 degrees) and counts within its ‘NowTime,’ in radians from 0 to π to 0 (or in degrees from 0 to 180 to 0). ‘T’ can be bidirectional, as when viewing the Earth from either pole.

“3a. ‘Conventional time, t’ is relative depending on transmission characteristics (Dr. Albert Einstein).

“3b. ‘RhythmicTime, T’ is relative to ‘synchronizaTion,’ depending on minds and mind locations, and can be Earth-Sun absolute, based on the Earth’s rotations.

“Both temporal forms are mental readings OF (not ON) various clocks.”

“Peter, there’s a phone call from England,” interrupts Chris

“OK everyone. Review these ideas. They are also in these copies of Target Article 92 from the Karl Jaspers Forum, on <www.kjf.ca>”.

(After a short break).

“Gentlewomen, gentlemen! You’ve digested some of that ‘intro’ I presume, so lets talk about ‘NowTIME’,” I say while reentering the Eagle Room.

“I’ll just say a few words about durations before we simplify our discoveries. Durations are not vectors, because they do not have both magnitude and spacial directions, but they can be associated with vectors, such as in travel, which association has caused past confusions. Durations are but differences in temporal scalar labels. Human abstract mathematics created a ‘theoretical’ multiplication of vectors but all known, living organism minds, including humans, cannot meaningfully multiply or divide either vectors or especially any of their associated durations. Such multiplications caused problems in 20th century physics.

“As an example, drive a vehicle south from Toronto, Canada, for 12 hours. During this journey ‘Lake Ontario Space’ rotates eastward to approximately ‘Lake Baikal Space,’ in Russia. Now your

journey of 12 hours duration south, plus 12 hours 'duraTion' east, lands you in a 'China Space!' But if you were to multiply these durations, the resultant 144 hours is meaningless.

"There is, in addition, a vocabulary which is easy and essential to understanding new temporal concepts, as all such concepts are always scalar quantities, like pricetags on merchandise, and not vectors, like displacements or velocities. We can define four varieties of such scalar 'tags'.

"Firstly we must review modern characteristics of part of an organism's mind, also called one's 'Event Space Sphere Or Spheroid,' acronym 'Essos,' pronounced 'Eee-sos.' The two 'Essos Edges,' inner and outer, are created by the production of 'Mental Vector Processes, MVPs' which are combinations of mass and/or energy vectors and scalar labels, destined to arrive at one's 'Mental Thought Process, MTP,' near 'Essos Centre'. (Please see Glossary.)

"Inside one's 'Essos' is subjective reality. Outside one's 'Essos,' and within an 'Essos Interior Volume,' are one's potential future and real past, the latter involving one's memory, knowledge, understanding, unconscious, culture, education and more.

"Let the scalar labels of 'Conventional time, t' and 'RhythmicTime, T' be 'timetags' and 'Timetags' respectively. The four varieties of scalar tags are as follows. The subjective 'timetags' and 'Timetags,' part of subjective reality, are within mind, within 'Essos.' Objective 'timetags' and 'Timetags,' part of one's objective reality, are ex-mind, 'ex-Essos,' either beyond ones outer 'Essos' boundaries as one's potential future, or, within an internal volume, as one's memory and more.

"Now for exceedingly important but relatively simple mind mathematics. Within 'Essos,' minds can add scalar labels. But, they cannot multiply them. Hence 't+T,' t+t, and 'T+T' within mind = 'Real TIME' where 'TIME' = 't + T,' but 't x T,' is meaningless, as described earlier in the Toronto to China metaphor. Similarly, colours and shapes, also being scalar labels, can be added, but not multiplied or divided.

"Please do not confuse the scalar characteristics of 'Conventional time, t' and 'RhythmicTime, T' with the 'transport carriers' named 'Mental Vector Processes, MVPs,' which can create 'Bioscientific Vectors' containing the scalar 'cargos' of t and 'T,' or their sum 't + T,' or other such 'cargos' as colour and shape. These 'MVPs' are simply mass and/or energy vectors transporting scalar 'cargos'. They seem the 'Most Valuable Players' in the 'Game of Life'.

"We let upper case 'TIME' exist only within 'Essos,' within 'Mind,' and it can involve t, 'T' or 't + T' but never a temporal product such as 't x T.' Such a product allows complications for current physics.

"Now we can and should talk a bit more about the important concept of 'Now TIME,' or its equivalent 'NowTIME!'"

Charles then states, "Please explain one of your favourite sayings: 'ALL (real) TIME IS NOW TIME.' Otherwise temporal concepts are just 'timetags' and 'Timetags'."

"No one is negating the continued use of the conventional, physical symbol and variable that we all know as lower case t, which normally stands, and stands alone, for our concept of time. But this concept still remains 'the enigma of enigmas,' the mystery of all philosophic mysteries. The following enlarged concept of 'TIME,' is merely an attempt to solve a part of this enormous enigma.

"Conventional temporal concepts have both a past and a future. Such can be derived, mainly as intervals between events, from measurements and predictions which are scientifically very sound. This means that such measurements can be reproduced by someone else, at some other place, at some other time and with remarkable accuracy. Therefore we must begin our definition with time, or its symbol, the variable lower case t, and build, adding recent suggestions of biophysics, namely that humans may be the only organisms on Earth to have evolved substantial future concepts. So our

mystery must include a larger group of ideas for which a symbol, upper case 'TIME' representing 'NowTIME,' has a more comprehensive, real and reproducible meaning, with animals as well as with humans. To discover this symbol, we must include another, a second, an independent concept of time.

"We now believe that there is a new additional type of 'TIME.' The older, common and well known first type is on your watch, is in your head and has a past, a present and a future. The newer, additional and less well known type is in your heart, in your feelings and it is always in your present. Now I'll try to describe this newer type of time, based mainly on what humpback whales have demonstrated in experiments right here in Trinity Bay and elsewhere.

"Let's proceed with the as yet undefined, biophysical notion of 'now' and its associated, seemingly valid, new physical concept of 'NowTIME.' The experimental discovery of 'Rhythm Based Time, or RBT,' is usually designated with an upper case 'T', only in order to differentiate it from the more usual identification of 'Conventional time' with its lower case t. 'RBT' or 'T' is defined as: *'a mental perception of lateness relative to an agreed, biophysical, cyclical concept of synchronizaTion (or onTimeness) between two or more minds'*. (Please see Glossary.) Experiments with many species of animals have indicated that 'RBT' is biophysically different from 'Conventional time, t.' This new 'Time,' which is used in communications for the encoding of information, by humans and possibly all species of other animals, is always in the present! So how do we enlarge the model of 'Conventional time, t'?"

"We must firstly think of 'NowTIME,' as, say, one cycle of 'RBT,' and then assign its measurement to the circumference of an 'Event Space Sphere.' Once we achieve this experimentally, as has been done mainly with humpback and other whales, we can now let measurements of 'Conventional time, t' within the sphere be related to the perception of 'real' now events as received by any 'Mental Thought Process, MTP,' located near the center of its sphere. Not only is the diameter of one's 'Event Space Sphere' arbitrary, in this model, but 'RBT' as measured on the surface of the sphere has the properties of supersymmetry. It will vary identically for a pathway along any orientation of a sphere circumference. Vectors with 'Conventional time' as a scalar cargo, move in the direction of vector energy or mass; 'RBT' always orients itself orthogonally and rotates.

"Now I'll say this in a different way. We all have an imaginary sphere around us, on and inside of which all events feel in our hearts and minds to be 'in the present.' Outside the sphere on one side, the side of incoming energy, events are in our future. On another side they are in our past. So we define events such as my utterances, or your cough Mark, as being in our 'NowTIME,' but only until the energy of the event, for example the energy of a sound, leaves the sphere, until one's next heart beat, next breath, next cough or until your mind switches to a different set of thoughts. Suppose Mark's cough energy traveled due north to Alex. Then we could label that moving sound with 'Conventional time, t,' the type that you know. As Alex hears the sound, the cough is real, the 'Conventional time' labels are real and both are in Alex's 'NowTIME.' But Alex has his own 'RBT' biorhythms which by definition are cycling, just like the wheels of a bike, but these cycles orient themselves into the east-west direction, as opposed to the incoming north-south direction! The new 'Time T' is always at right angles to the old 'time t.' But most importantly, in new communications research they work together like best friends! They add to create a new, upper case 'TIME'.

"All events are associated with energy and/or mass vectors and those occurring outside one's 'Event Space Sphere' are by definition not in one's 'NowTIME.' Also associated with such vectors are 'timetags,' (or 't-labels'), mental, inscribed, machine made, etc., which are in fact the very

numbers, and perfectly valid numbers, that we have been using to measure time, in all fields; 'timetags' (or 't-labels') can label vectors with 'Conventional time concepts'.

"From one's future such labeled vectors enter one's 'Event Space Sphere' and it is then that the said energy and/or mass which penetrates one's present awareness, and their 'timetags' or 't-labels' become additionally associated with real 'NowTIME.' Upon leaving, one's 'NowTIME' the 'timetags' become part of one's past. The transition occurs when the 'Mental Thought Process, MTP,' at or near the center of the 'Event Space Sphere,' switches internal mental processing from one set of associated 'NowTIME' vectors representing a distinct event, to another set. An example could be 'conscious thought change'.

"'TIME' is in the present mind of an organism now, and for any diameter of its 'Event Space Sphere,' it consists of real 'NowTIME' concepts, real time t and its 'timetags' and real 'RhythmicTime, T' and its 'Timetags.' Outside of one's 'Event Space Sphere' (both past and future) are valid labels, valid numbers, valid memories, valid plans, but they have not the 'reality of *nowness*' or of 'NowTIME!' Thus the submission that: **'ALL (real) TIME IS NOW TIME.'** Otherwise temporal concepts are just 'timetags' and 'Timetags'."

Elliston Research (several days later)

Nicholas is last to climb aboard as Kirk, on shore, casts the lines away and we head out between partly grassy, inner islands, bleached in places with flat, surface nests and eggs. Circling above the islands are many glistening white, Arctic and common terns. Next come tens of thousands of puffins, some on the water's surface in great blackish clusters, most, however, roosting at burrow edges, while others are well out of sight at ocean depths, gathering capelin for their growing chicks which are relatively safe on the towering South Gull Island. Beyond are the humpbacks!

"Main transmitter on signals every sixty seconds Nick."

Puffins burst to the surface on all sides as *Ceres* slows evenly to 'dead slow,' to give these amazing diving alcids plenty of opportunity to plummet again if they are in our forward going pathway. With the wind calming quickly some have great difficulty becoming airborne with four or five fish in their beaks, an extraordinary payload!

"Feeding humpbacks must have trouble avoiding so many puffins," remarks Hans. "They are never found ingested by the whales, probably because puffins seem to fly better underwater than in the air! However, an unfortunate gull was once discovered wedged between baleen plates of a humpback in Norway!"

"When we get closer, watch for a whale firing a puffin into the air as they are too large to fit down the whale's throat!" jestingly adds Nick.

"OK team, we have Ida's group of nine humpbacks and at least three minke or piked whales. Keep a good lookout for signals at the same time as Nick's 'count downs.' One humpback should finish feeding before too long."

"5-4-3-2-1-mark," says Nick as a misdirected puffin flies between Alex and George, standing less than a meter apart in the bow of *Ceres*!

Nick has asked Alex to scan between 9 o'clock (port beam) and 12 o'clock (dead ahead), and George between 12 and 3. Both men are wearing brimmed hats and Polaroid glasses to reduce the surface reflected light and increase contrast.

"Remember to keep the eyes relaxed and scan 90 degrees, or pi/2 radians in about 5-8 seconds in both directions," I remind everyone. "Think of your clock bearings so that you can communicate to the group, first bearing, then range, if a whale appears."

"Blow, 4 o'clock, 100 meters, heading toward us, it's Andrew," says Nicholas. "10 seconds to alpha. Mark! Synchronization!"

"Use the 'offTime' passkey, Nick." Then a kick tap from the mast signifies 'roger.'

"Please explain the communications," exclaims Hans from his starboard stern observation post.

"For Andrew we will use the 'passkey message' of 'offTime' twice, then 'onTime' once, to set the RBC variables at 30 and 60 seconds for future messages," I reply.

"Seven o'clock VERY CLOSE," shouts Elliott!

"Heading our way, that's Ida, then Hubert, then Cecil, they've identified us for sure," I say.

"Ready on the first message signal 2-1-mark," announces Nick.

"Minke, 1 o'clock, crossing under the bow, watch for the white flipper 'armbands'," I say to Alex and George. "Three o'clock - one kilometer, Gannets plunge-diving, watch for whales or dolphins driving the capelin toward the surface," as I point to our starboard beam.

"Second 'offTime' signal 2-1-mark, in sync. with the coded computer beeps," says Nick.

"The greeting will be complete, gentlemen in about twenty seconds so watch for signals in your segments, I'll take the forward half, Nick the stern."

The third and final underwater, acoustic pulse is softer, gentler, but right 'onTime.' Then miracle of miracles, Ida and Hubert surface together and exactly in the middle of our 'offTime' window with precisely synchronized blows, one on either side of Ceres. Then they signal together in the next 'offTime' window and Andrew joins with all three, exhaling together in the 'onTime' window. Such is a very complex but successful 'reciprocal greeting.' All the while we are proceeding east at dead slow using one engine; both engines are raised to shallowest depths.

We now transmit the south concept, 'late, offTime, late,' and then turn the *Ceres* abruptly south. All three humpbacks follow. We transmit the north concept, 'late, onTime, late,' and then turn north with the whales following. We repeat these concepts again and then again with the same results.

"Now you must ask them if our east west coordinates are their 'Conventional time'," says Alex.

"That means abandoning the 'RBT' windows. What do you suggest?"

"I calculate that if you head east, you could transmit three pulses every six seconds at 6, 12 and 18 seconds, then west, using pulses every twelve seconds at 12, 24 and 36 seconds," replies Alex.

"If you are ready Nick, we'll turn east and west for three messages in each direction."

And the experiment progresses with detailed computer records but slightly less detailed human conscious understanding, and no cetacean mimicry.

"Now comes the crucial test Alex. We must switch to the interrogative and look for meaningful replies."

So we reverse the 'Rhythm Based Time, RBT' that is similar to flipping your watch over, and transmit 'early, offTime, early,' while going south. Ida answers in the affirmative with two flipper slaps in the 'onTime' window. We repeat and then we head north and transmit 'early, onTime, early' and again Ida answers yes! We repeat again and then test reliability by heading south and using the identical 'north message' and Ida, catching on quickly, answers no with two tail slaps in our 'offTime' window, meaning negative.

Then comes the big test! We head east with reversed 'RBT' and three signals outside our 'RBT' window variables to represent 'Conventional time.' Ida answers yes. Then we head west with signals at 48, 36 and 24 seconds ('RBT' reversed from the previous west message) and again Ida answers yes, this time with a half breach with two distinct flipper slaps on landing, just a few boat lengths away! There seems no forward going 'Conventional time' but instead variable, bidirectional windows of 'Rhythmic Time.'

"Looking good gentlemen; we must repeat the data and perhaps we'll get a different communicating whale if Ida's stress increases due to hunger."

We try it again in differing order and each time Alex follows closely with efficient human-human communications aboard *Ceres*. Sure enough, Hubert switches places with Ida, then Andrew

takes over the communications leadership. Each repeats Ida's replies. Anyone watching from the land must think that we are doing a geophysical grid survey for sunken treasure but I would have enjoyed explaining to them that we appear to be uncovering perhaps the greatest treasure of all, Nature's knowledge.

"If only Mr. Einstein could be here now I feel sure he would rejoice in this evidence for the missing variable of Nature, that's 'Rhythm Based Time' and its orthogonal, bidirectional and absolute properties."

We repeat the experiment on into encroaching darkness and then head for the safe harbour of Bonavista. Passing the peninsula headland I explain that we are closer to Europe, via the great circle route, than any land in North America and that this was not only the likely landfall of John Cabot in 1497 but also of vast numbers of trading ships during the following 400 years. It is also the location of the first satellite tagged humpback whale named *Theophilus Argus* after both the fisherman and the satellite system used for tracking! We were able to sit in the Ceta-Research laboratory back at Trinity and track the whale hundreds of miles away. This was for both daytime behaviour where we have some knowledge over the past hundreds of years, as well as for night-time behaviour, where we have practically none!

In dead calm waters under the night lights of one of the largest fishing towns in the world, we speed toward the harbour, hearing whales in the distance and avoiding rocky shoals that are well known to Nicholas and myself. We entered Bonavista harbour just as had the replica of Cabot's *Matthew*, in 1997, celebrating the 500th anniversary. However they had encountered stormy seas with a cold winter-like wind, but were welcomed by Canada's Queen, who had helicoptered in for the festive occasion.

GLOSSARY

(Single quotation marks are used, as in text, primarily for new concepts.)

Altruism - Having regard for others; to give or to act without reward; to be unselfish.

Bidirectional - Functioning in two spacial directions.

Biophysics - The science of the application of the laws of physics to biological phenomena.

'Cetacean-Contact' - 'Rhythm Based CommunicaTion, RBC' with whales, dolphins and porpoises.

Clock - Any mechanism and/or life system that represents, or is capable of producing cyclic, recurrent or predictable motion, and measures temporal qualities.

'ClosedWords' - Neglecting a normal space between words (e.g. OnTime). Used to signify 'Rhythm Based Time, T or RBT.'

Communication and 'CommunicaTion' - The passing of information involving: a) transmission, b) reception and c) the altering of subsequent behaviour. Please see 'SBC' and 'RBC.'

'CommunicaTion' - 'Rhythm Based CommunicaTion, RBC.'

Conventional - Traditional (in opposition to recent inventions etc.).

'Conventional time, t or Ct,' or the commonly used noun 'time.' Please see the following section named 'Conventional time Categories'.

Cyclic - Revolving in recurrent series of events and/or phenomena.

Dimensions - a) 'Spacial dimensions,' which define all known geometry, or b) Variables, which may be scalar quantities, the usage of which is now not recommended in order to avoid confusion with a).

Displacement - Distance in a direction.

Duration - A 'Conventional timetag of t or Ct' of increased quantity less one of lesser quantity.

'DuraTion' - A 'Timetag of T or RBT,' of increased quantity less one of lesser quantity.

'Earth Life' - An 'Earth source domain' using communication or 'communicaTion.'

Empathy - "Experiencing strong affection or passion" (Britain and U.S.), "Feeling into, as in watching a high-wire artist" (German), definitions by Dr. Frans De Waal.

'Essos' - 'Event Space Sphere Or Spheroid' (pronounced 'Eee-sos'), which is a synonym for part of one's 'Conscious Mind.' Such is an abstract volume useful to describe the dynamic orientation and magnitude of conscious space variables, real 'Now time and Now Time' and their combination called 'Now TIME.' 'Essos' and 'Ex-Essos' have been called "Subjective-inclusive Experience" and "Mind-independent Pre-structured Reality," respectively, by Dr. Herbert Muller of McGill U.

'Future' - Scalar labels of 'Conventional time, t or Ct' or 'Rhythm Based Time, T or RBT,' and their associated 'Mass/Energies,' (definitions to follow) that have not yet arrived at one's 'Essos.'

'Information (SBC)' - Information encoded in the sensory modalities, of signals, signs and symbols, and described by 'Conventional Communication' or 'Signal Based Communication, SBC.' ('SBC' definition to follow). Please also see 'World Phenomena' below.

'InformaTion (RBC)' - 'InformaTion' encoded in 'Time,' that is 'Rhythm Based Time, T or RBT.' This is the medium of 'Rhythm Based Communication, RBC or CommunicaTion.' Please see definitions above and below as well as that of 'World Phenomena,' below.

'Mass/Energy' - Either mass or energy or both.

'Mental Thought Process, MTP' - An area near 'Essos Centre' for receiving and processing mind's 'Mental Vector Processes, MVPs' (this very important definition follows directly).

'Mental Vector Process, MVP' - A combination of a 'Mass/Energy' vector and any number of scalar quantities, formed at or outside one's 'Essos Edge,' and ending at one's 'Essos Centre.' 'MVPs' seem the 'Most Valuable Players' in the 'Game of Life.'

Mind (conscious) - 'Mass/Energy' and information, or 'informaTion,' involved with the architecture of a central nervous system and within one's 'Essos.' The important 'Essos' definition above is a synonym for part of one's 'Conscious Mind' and it includes additional conscious mental aspects.

Mind (unconscious) - 'Mass/Energy' and information, or 'informaTion,' possibly involved with any active cell of a living being but not within 'Essos.' The important 'Essos' definition is above.

'Nature-Contact' - 'RBC' with humans and Nature.

'Nowness' - One's immediate present.

'Now time' - 'Conventional time, t or Ct,' associated with events in one's present and contained within one's 'Essos.' Please see 'Conventional time Categories' to follow.

'Now Time or NowTime' - 'Rhythm Based Time, T or RBT,' associated with events in one's present and contained within one's 'Essos.' Please see 'ClosedWords' above and 'Time and TIME Categories' to follow.

'Now TIME or NowTIME' - Both 'Conventional time, t or Ct,' and 'Rhythm Based Time, T or RBT,' associated with events in one's present and contained within one's 'Essos.' Please see 'ClosedWords' above and 'Time and TIME Categories' to follow.

'OnTime, LateTime, OffTime, EarlyTime' - Elementary cyclical 'Windows' of 'RBC.'

'Ontimeness' - synchronization (defined below).

'OnTimeness' - 'synchronizaTion' (defined below).

'Orthogonal' - At right angles or 90 degrees.

'Orthogonal Spacial Dimensions, OSDs' - of which there are a maximum of only three. (as an example: east, north and up). Please see 'Space' definition below.

Paradigm - A mode of viewing the world which underlies scientific theory for a period of history.

Paradigm Shift - A fundamental change in approach and/or philosophy.

'Past' - Temporal labels and their associated 'Mass/Energy' that have left one's 'Essos.'

Perception - An interpretation based on one's understanding.

'RBC' - Please see 'Rhythm Based Communication,' plus Communication and 'CommunicaTion.'

'Rhythm Based Communication, RBC' or 'CommunicaTion' - Encoding in RBT and using 'InformaTion (RBC)' or 'RBI.' Please see definition of 'Rhythm Based InformaTion, RBI.'

'RBI' - Please see 'Rhythm Based Information,' 'Information (RBC)' and 'World Phenomena.'

'Rhythm Based InformaTion, RBI' - 'InformaTion' encoded in 'Time, T or RBT.'

'RBT' - Please see 'Rhythm Based Time' or 'T'

'Rhythm Based Time, T or RBT' (as opposed to 'Conventional time, t or Ct'). "A mental perception of lateness relative to an agreed, biophysical, cyclical concept of synchronizaTion (or onTimeness) between two or more minds." Please see 'Time and TIME Categories'

'SBC' - Please see 'Signal Based Communication.'

'Signal Based Communication, SBC' - 'Signal Based Information, SBI' encoded in 'Conventional time, t or Ct.' Please see definition of 'Signal Based Information, SBI.'

'SBI' - Please see 'Signal Based Information,' 'Information (SBC)' and 'World Phenomena.'

'Signal Based Information, SBI' - Information encoded in signals, signs and symbols and using 'Conventional time, t or Ct.'

Scalar - Having only magnitude, without spacial direction, that is, without spacial dimensions.

Space - Vectors, always containing both magnitudes, and spacial directions of: I) east-west, north-south, up-down, II) right-left, forward-backward, up-down or III) north celestial pole, declination, right ascension east of the 1st Pt. of Aries. I and III are objective, II is subjective or 'of Essos.'

'Spacial Dimensions' - Vectors which are most often considered orthogonal (in which case there are up to three and only three spacial dimensions). Please see definition of 'Space,' above.

Spacial Directions - Space vectors, which are not necessarily orthogonal.

Symmetric - When certain positions rotate into other positions in the same set.

'Sync.' - An abbreviation for either synchronization or 'synchronizaTion.'

Synchronization - Happening at the same linear or cyclical, 'Conventional time, t or Ct.'

'SynchronizaTion' - Happening at the same cyclical, 'Rhythm Based Time, T or RBT.'

'Temporal Tags' - Please see 'Conventional timetags, Timetags, and TIMEtags,' to follow.

'True altruism' - To give or to act without the expectation of a reward.

Vector - A quantity having spacial direction as well as magnitude.

'Whale-Contact' - 'RBC' between humans and whales.

'Windows' - Relatively short 'RBT duraTions' of 'Rhythm Based CommunicaTion, RBC.'

'World Phenomena' - Mass, Energy, 'Information, (SBC)' in t, 'InformaTion, (RBC)' in 'T.'

'Conventional time Categories'

'Conventional Communication' - Please see 'Signal Based Communication, SBC.'

'Conventional time, t or Ct,' or the commonly used noun 'time.' Displacement divided by velocity or space divided by speed, as a temporal, scalar label which can move in the direction of its associated 'Mass/Energy' vector. Traditional concepts of 'time' differ from the new 'Rhythm Based Time, T or RBT.' Please see 'Time and TIME Categories,' to follow.

'Conventional time, t or Ct, tags' - The association, either physical or mental, of 'Conventional time, t or Ct' scalar labels, with 'Mass/Energy' vectors, or simply 'time t' scalars. Please see following definitions.

'Conventional timetags (developing)' - Varying scalar labels of 'Conventional time, t or Ct' produced by a working, linear or cyclical clock.

'Conventional timetags (fixed)' - Scalar labels, either mental, inscribed, machine made, geophysical, geologic or others, of 'Conventional time, t or Ct.'

'Conventional timetag-vector' - A 'Conventional timetag, t' on a 'Mass/Energy' vector. Some call this a 'time-vector,' which is discouraged as time does not flow on its own.

'Time and TIME Categories'

'T' - Please see the following definition of the new 'Time' or 'Rhythm Based Time, RBT.'

'Time,' 'Rhythm Based Time, T or RBT.' - "A mental perception of lateness relative to an agreed, biophysical, cyclical concept of synchronizaTion (or onTimeness) between two or more minds." — Via Dr. Hitoshi Kitada (Tokyo), $T = \exp(it(\pm 2\pi)H/\text{Planck constant } h)$, and for any complex number $\exp(i \text{ theta})$ on a sphere of radius one (where theta is any fixed real number), then $\exp(i \text{ theta})\exp(it(2\pi)H/h)$ is a solution of the Schrodinger equation where H = a Hamiltonian operator, and for $\text{theta} = (2n+1)\pi$, (and $n = 0, \pm 1, \pm 2, \dots$), $\exp(i \text{ theta}) = -1$ and T becomes both bidirectional and "rotation free."

'TIME' - 'Conventional time, t or Ct,' plus 'Rhythm Based Time, T or RBT,' within 'Essos.'

'Time T, or TIME (t+T) Tags' - The association, either physical or mental, of 'Timetags or TIMEtags,' with 'Mass/Energy' vectors, or simply 'Time T' or 'TIME' scalars. Please see following definitions.

'Timetags (developing)' - Varying scalar labels of 'Rhythm Based Time, T or RBT' produced by a working, cyclical clock.

'Timetags (fixed)' - Scalar labels, either mental, inscribed, machine made, geophysical, geologic or others, of 'Rhythm Based Time, T or RBT.'

'Time/timetags' - Either 'Timetags and/or timetags.'

'TIMEtags' - 'Timetags and/or timetags' on vectors with combined, resultant 'TIME' labels, always within one's 'Essos,' and comprising 'Real TIME.'

'Timetag-vector' - A 'Timetag' on a 'Mass/Energy' vector. Some call this a 'Time-vector,' which is discouraged as 'Time' does not flow on its own.

'Timing' - The arithmetic of all combined time, 'Time and TIME' concepts, including recordings.

APPENDIX

'RBC' and General Experimental Technique

"Firstly choose a time of low internally and externally caused stress, such as, no need for nutrition or, no fear of mind/body discomfort. Then 'share a rhythm!' This can be interpreted as energy packages traveling between organisms, which signals have a common, compatible, between pulse 'duraTion' called an 'alpha concept.' Upon synchronization, these 'duraTions' become a shared rhythm. Now add a second simple message called a 'beta concept,' as explained presently, and to your surprise, 'Rhythm Based Communication, RBC' can begin!"

"It might be useful if you gave common examples of 'alpha concepts' and some good communication signals for both whales and land mammals as well as bald eagles," interjects Nicholas.

"OK, or as some of you would say now, just 'kay.' For roosting eagles we use an 'alpha concept' or rhythm of 12 seconds with mainly whistles and light flashes for signals. For fox kits and snowshoe hares we use a rhythm of 20 seconds with mainly finger snaps and rock taps. For beaver, black bear, caribou and moose we use 32 seconds, underwater sounds for beaver but mainly comb flicks and light flashes for bear, caribou and moose. For whales we use 60 and 90 second 'alpha

concepts' with computerized, underwater, acoustic transmissions of various intensities. By the way Nick and Kirk, choose four to join *Ceres* this morning on the water. Everyone should get chances when whale contact space is available.

"Next you transmit non frightening, rhythmic, 'alpha concepts,' called 'alpha rhythms'.

"Record identification and behavioural details of any animal that returns a signal appearing to be at the same time as your transmitted signal, which behaviour is 'possible-synchronization,' or 'possible sync.' Cease all transmissions for a 10-15 minute coffee break if no sign of a 'possible sync.' occurs in 15-20 minutes. Postpone the experiment if active feeding or external stress is suggested.

"Following 'possible sync.' send the next signal 'late,' which is a 'beta concept.' This is 'the first message signal.' Transmit another signal 'late' using the identical amount of 'lateness.' This is 'the second message signal.' It will and must follow 'the first message signal' by the 'alpha concept,' which, in other words, is the 'pulse interval' before synchronization.

"Record all signals from your single animal or any in a group but place maximum effort in following and observing the animal associated with the suspected synchronization. Note that you have not proven anything beyond coincidence yet, but, that will come next, as you hopefully enter the world of 'RBC'.

"Transmit the third message signal which must be 'onTime' or at a 'RhythmicTime' corresponding to the beginning of the synchronized 'duraTion' which is also called the 'alpha time.' Successful 'RBC' is now, complete if receiving partial message mimicry, so keep up a maximum effort to observe and record, without transmissions.

"For example, a transmitted message of 'late, late, onTime,' which gives a 'key' of the amount of lateness, or the 'beta concept,' should return the key with a mutual understanding of both the 'alpha and beta concepts,' when you receive signals which are 'late, late, onTime.' Then, return to the main research lab, across Taverner's Path from the Inn, or find Tim, Kirk, or myself with news of success, good data or new knowledge."

There is student silence, save for the scratching of note taking. Then abruptly hands go up.

"Exactly what is an 'alpha concept'?" asks one.

"It is an idea in your mind, presumably transmitted to the mind of an organism, which is simply the between pulse 'duraTion' during intended 'synchronizaTions.' We use this 'duraTion,' 'synchronizaTion' and 'onTime' etc. spelling to emphasize the 'RhythmicTime T,' not 'Conventional time t','" as I copy these 'RBC' words onto a flip chart.

"Then what again is a 'beta concept'?" questions another.

"It is an idea in your mind, hopefully transmitted to the mind of an organism, which is simply the 'duraTion' of the first one quarter of the 'alpha concept,' rhythmic cycle. It starts with 'synchronizaTion' and ends in the 'lateTime' window. Similarly, the 'gamma and delta concepts' are the 'duraTions' of half and three quarters of the same rhythmic cycle, ending in the 'offTime' and 'earlyTime' windows, respectively."

Tim joins in with, "Your opening message, now called a 'passkey,' or in human concepts simply a greeting, will then be as mentioned, 'late, late, onTime,' or 'beta, beta, alpha.' This has already been programmed into your computers by hitting both the 'Psion' and 'P' buttons at the same time."

"Humpback whales are now teaching us that 'offTime, offTime, onTime' or 'gamma, gamma, alpha,' is another and different passkey. This message seems more universal, so you might want to try it if you don't get message mimicry from the programmed passkey. I'm beginning to feel that both keys work but convey slightly different but as yet unknown specific meanings."