

The Mach's Paradigm Forum

Early in 2007 someone brought to the notice of Viv Pope that some members of a forum group, named BAUT (Bad Astronomy and Universe Today), believing that he had died, were engaged in discussing his ideas. On this assumption that 'Viv Pope has died', one of the members of that group had elected himself as the chief 'apologist' for these ideas. To disabuse these people of the notion that he was deceased, Viv eventually subscribed something to the forum.

The issue, up till then, had been that of whether or not Viv's seminal argument that the constant c is not the conventional 'speed of light' is true. Informed of how far the logical implications of accepting the truth of Viv's argument extend into modern physics, some core members of BAUT invited Viv to open a new thread dealing with these wider implications, particularly in relation to POAMS (the Pope-Osborne Angular momentum Synthesis). Here is Viv's posting in response to that invitation:

Post 1

This new thread for the BAUT forum is a spin-off from an earlier thread started by a senior member of the group writing under the pseudonym 'North'. The reason for this spin-off is what became, as Bob Angstrom described it, 'the long and scattered nature' of that thread. The thread was entitled 'The speed of light is infinite', and what happened was that it became impossible to contain that issue within the narrow channel of simple yea's and nay's in answer to the question. Eventually, the full implicational structure of the positive answer to that question began to emerge. This was in the name of POAMS (the Pope-Osborne Angular Momentum Synthesis) as described on the website www.poams.org. POAMS is the name given to a group of heretical academics from departments of Philosophy, Maths, Physics and Electronic Engineering, who have published books on the subject of 'Instantaneous Action at a Distance' (IAAAD). This overflow of the subject from its original narrow channel into the philosophical floodplain introduces a whole new paradigm of modern physics which includes maths, relativity, quantum theory, gravitation theory, electronic theory, *etc.* all within the context of a neo-Machian science-philosophy called *Normal Realism* (see Google Search).

The thread started off well enough, with good solid support from an interested core of the BAUT membership. Here are the second and third of the subsequent postings (stages in the explication of POAMS).

Post 2

In POAMS all observed motion is *angular momentum*. Newton's theoretical ideal of rectilinear force-free motion is approached only as the radial parameter of the angular momentum mvr approaches infinity (a circle of infinite radius being a straight line). It follows, then, that all *finite* angular momentum is naturally curved, or orbital, without involving Newton's idea of an invisible, *in vacuo* 'force of gravity' balanced-out by an equally invisible 'centrifugal force'. POAMS proves that angular momentum is an automatic natural balance between paired masses, which balance is instantaneous and reciprocal, keeping bodies either apart or together according to the amount and orientation of the angular momentum, with there being no question of 'vacuum forces' being involved. The force we feel as 'weight' is simply the *real* force which objects exert on the surface of a planet whose surface radius is greater than the body's natural free orbit.

As well as being overall-conserved, which automatically correlates the free motions of distance-separated bodies in the manner observed in systems such as our solar system and spiral galaxies, angular momentum is also *quantised* in units of Planck's constant divided by 2π . These units are what classical convention has named 'atoms', the simplest of which is that of hydrogen in which a single small mass (classically named the 'electron') orbits a much larger, central mass named the 'proton' in the manner originally conceived (by Niels Bohr). When these atoms interact, one of them (the 'emitter') loses a quantum of angular momentum while the other gains precisely that same amount – *instantly*, because the conservation of angular momentum cannot allow any delay in the consummation of that transaction. Such transactions can take place, of course, only between atoms that are precisely matched in resonance with each other. POAMS calls these atoms

'quantum accumulators', and the transacted energy (action) quanta are re-named *phota* (plural of *photum*) to avoid the spurious suggestion of a 'travelling particle' as does the conventional name 'photon'.

Recall that in POAMS, on the quantum level there are nothing like the ordinary space and time of macroscopic observation. These latter are an observational projection out of patterns and sequences of quantum information in a manner similar to that in which the viewer of a video scenario projects its dimensions and characters out of patterns and sequences of screen pixels.

Post 3.

What is light? Basically, it is *what we see*, both optically and instrumentally, in its full spectral range from deep infrared to far ultraviolet and gamma. From the information contained in the light we project the world as we know it, with all its characteristics of distance, direction, parallax, time, motion and so on. In empirical (phenomenalist) science, this information is ontologically primary (*a priori*), and what we project out of it is no more than secondary (*a posteriori*). On the commonsense level (of ordinary objects such as pigs, barns, chairs, rocks and so on) these projections are seldom questionable – except, of course, in instances of illusion, delusion, mirages, *etc.* On the scientific level, however, especially in physics and astronomy, the projections are far less certain, especially where the objects they deal with are theoretical rather than observational. Failing to realise this leads to the stultification of a developing science into a congealed, convention-bound state which we conserve at the risk of promoting confusion rather than clarity.

A too-conservative science, therefore, may be counterproductive to natural understanding, and it is to militate against this stultification that more and more forums like this ATM (Against The Mainstream) one are now burgeoning.

Having started in this positive way, before it could really get under way the thread was soon infiltrated by negative elements whose sole aim, for reasons that can only be guessed at, was simply to frustrate the whole enterprise. Viv's intention of presenting such a huge chunk of science-philosophy in short, easily-digestible stages was therefore, in the end, thwarted, due to the discussion-thread being swamped by those who, in his angry response, Viv named the Umbala Group^[*]. Eventually, Viv's somewhat 'Celtic' reaction to these anti-philosophers (whom he classified as 'philosophobes') led to complaints from members of that hostile group that he, Viv, had overstepped the mark that was laid down officially as the Group's policy of non-nastiness. For this reason the Controller of the Forum was called upon to ban him.

Nevertheless, it was admitted that this POAMS thread had been among the most productive and interesting of the forums to date, and the banishment was accompanied by a tacit plea for Viv not to regard it as permanent. Although the way was plainly left open for him to rejoin, having thought hard about it he decided that because not enough sympathisers had 'stood up to be counted', there was insufficient 'bottle' among that group to warrant his remaining a member. So he abandoned the project as a lost cause and decided not to waste any more time on it.

Meanwhile, it had been suggested by members of the POAMS/NRIG seminar group, who had held a watching brief on those discussions, that a new forum should be set up under the complete control of POAMS for un-interrupted dissemination and discussion of the philosophical and physical issues that POAMS raised. Unfortunately, before the new forum really got going, Viv was beset by some serious health problems. The following is a record of what was at least the intention of the exercise, had it continued.

* 'Umbala' in this context refers to a joke once made by the astronomer, Patrick Moore, in which the word was used to indicate the 'bullshine' that covered the floor in the Indian Temple of the Sacred Bull.

The Neo-Machian Physics Paradigm of Direct Action

Stage 1. Introduction

The Physics of Ernst Mach was based on *phenomenalism*, that is to say, on direct sensory and instrumental data. This paradigm is incommensurable with the so-called 'Realist' paradigm of Galileo, Newton and Einstein, according to which the light by which we observe things travels in space from physical objects to the observer and between those objects at the finite speed, c , of 300,000 kilometres per second.

This gives us two distinct Physics paradigms to consider. Let us refer to these, henceforward, as the **Mach Paradigm** and the **Einstein Paradigm**. Both of these are relativistic, that is to say, observer-centred in their approaches to Physics. In fact it was from Mach that Einstein obtained his inspiration for his famous Theory of Relativity. The only difference between the Einstein theory and what we shall refer to as the **Neo-Machian theory**, is that whereas in the Einsteinian theory the observer and the physical world are separated by light 'travelling' between the one and the other, in Machian phenomenalism there is no such 'Einstein separation'. Instead, the observer is in direct contact with physical phenomena. In other words, while in the Einstein theory it is axiomatic that 'light travels *in vacuo* at the speed c , which is constant for all observers whether relatively moving or stationary', in the Neo-Machian theory there is no such axiom. Instead, the constant c is interpreted as just that, a *constant*; that is, a numerical ratio between observational distance measures and observational time measures, of value depending on the convention system of measuring standards used. Thus, in the Metric System, c is the ratio of 300,000 kilometres to the second, while in the Imperial System it is 186,000 miles to the second. In an ideal Neo-Machian formalism, every metre would be equivalent to 3.3 nanoseconds, in which case c would be unity and drop out of account in all the relativistic equations.

Mathematically speaking, then, there is no conflict between Neo-Machian relativity and Einsteinian relativity since in all purely mathematical respects, c is the same in both theories. This means that apart from the issue of simplicity of deduction, there is no mathematical or experimental way of distinguishing the two theories, not at this early stage, at any rate ^[1]. That comes much later in POAMS, with the replacement of 'gravity' with orbital angular momentum – which, of course, is the literal nub of the Angular Momentum Synthesis. Needless to say, in the Neo-Machian theory the fact that c is constant with respect to all observers whether moving or stationary follows automatically from the definition of a dimensional constant, like the ratio of three to one in the conversion of feet into yards, or 0.45359 kilogram to the pound – or the ratio c -squared in the conversion of mass in kilograms to joules of energy. In the Neo-Machian Paradigm, then, in seeking more and more precision in the measuring of c , what is being measured is not 'the speed of light' but simply the ratio between two historically disparate conventions in the arbitrary choice of measuring units, as though one were trying to measure, as exactly as possible, the ratio of pints to litres in liquid measure.

However, although the two theories of relativity, the Neo-Machian and the Einsteinian, are *mathematically* the same (at least up to the point where 'gravitation' comes in, see following) their consequences for the philosophical understanding of Modern Physics are vastly different. But while the physics consequences of the Einstein Paradigm have been explored and, so far as they go, are familiarly well tried and tested, the same cannot be said of the Machian Paradigm. Indeed, apart from one or two references to Mach, as in the 'Mach number', 'Mach's Principle' and a few other contributions, the name of Mach is almost unknown in contemporary physics. Far less is there, in contemporary physics, any true knowledge of Mach's distinctive philosophical approach to the subject.

However, that is not *quite* true. There were probing attempts by some scientists, starting with Herman Bondi, of Cambridge, and Viv Pope of Swansea, in the 1960s, which independently revealed, as concurred between them, that the Theory of Relativity can be deduced much more simply and naturally from the Machian Paradigm than from the standard mainstream Paradigm. This is on the basis of *direct action* between object and observer, with c being interpreted as a *pure constant* of observational dimensions rather than as a ‘velocity’.

A meeting between Pope and Prof. A.E. Chubykalo of the University of Zacatecas, Mexico, after the latter’s reading of a Pope-Osborne paper in Physics Essays ^[2], led to the publication, in 1999, of a book entitled *Instantaneous Action at a Distance in Modern Physics: Pro and Contra*, a compilation of papers by international authors, edited by A. E. Chubykalo, N. V. Pope and R. Smirnov Rueda ^[3]. This, in turn, led to the proposal by one of the ‘Pro’ lobby of contributors to the book, Prof. P. Graneau, that we convene a follow-up workshop specifically for the Pro-IAAAD faction. The result of this was a second workshop held, like the previous one, at the University College of Wales, Swansea, from which sprang another book. This was entitled *Immediate Distant Action and Correlation in Modern Physics: the Balanced Universe*, and was edited (and produced) by N. V. Pope, A. D. Osborne and A.F.T. Winfield, published in 2004 by Edwin Mellen Press, UK and USA. It should also be mentioned that another, much less expensive book on the same subject, by Viv Pope, has been published by Phi Philosophical Enterprises, UK. Called *The Eye of the Beholder, the Role of the Observer in Modern Physics* this is available from the Welsh Books Council, website: www.gwales.com

Unfortunately, many members of the Science community have not been able to perceive these publications as anything but a scurrilous ‘attack’, on Mainstream Physics in general and on Einsteinian Relativity in particular. The essential differences in the language and the extreme simplicity of the method of mathematical deduction of the Neo-Machian alternative have therefore been interpreted as a ‘lack of understanding’ of mainstream physics and, especially, of ‘Einstein’s Theory’. This hostility can be witnessed, for instance, in many of the postings in the BAUT (Bad Astronomy and Universe Today) science forum ^[4]. This experience of just how much acrimony can be generated by an exploratory enterprise such as POAMS has led to the necessity of sifting-out, in the new forum, any responses of that same purely ‘Yah-boo’ variety. In their anger at POAMS some of that acrimonious (so-called ‘Umbala’ group) have gone into complete logic over-ride, which is an experience one does not wish to repeat. So, contributors to the new forum will be expected to be familiar with at least some of the main publications of POAMS in its books, papers and websites, prior to criticising it. On that condition criticisms are, of course, not only welcome but are also naturally expected, as part and parcel of such a heuristic, or open-ended, enterprise. So that this will not lead to the sort of chaos that was experienced in the BAUT forum, in this new one, some working knowledge of commonsense logic and scientific method will be required. Also, some competence in simple maths (GCE and/or A-level) would be preferable, although not absolutely essential. The Moderator will ban anyone flagrantly abusing these stated conditions.

In these discussions the emphasis, throughout, will be on ordinary **commonsense language**, with a minimum use of mainstream scientific jargon. The aim of this forum may thus be defined as being, by the use of critical, commonsense-logical argument, to reach a consensus view as to how Modern Physics might have developed along the logical lines of the Machian Paradigm instead of the customary Einsteinian one. Since the furthest advances so far into this prospective, Neo-Machian Paradigm are those made by POAMS (the Pope-Osborne Angular Momentum Synthesis), that will be the first focus for discussion in this forum. Since the two paradigms, the Machian and the Einsteinian, are philosophically

incommensurable, any pick-and-mix of bits out of both is a prescription for confusion. For this reason, the exercise will be to sort out and separate the concepts appropriate to each one, respectively. In this way, the discussion will be as much a linguistic as a mathematical-physics exercise.

Viv Pope (N.V. Pope), March 7th, 2007

The Neo-Machian Physics Paradigm of Direct Action

Stage 2. Special Relativity

Historically, the dimensions of motion, or velocity V , namely, distance s and time t , were taken as independent variables. A graph of velocity, plotted in the usual orthogonal way, was therefore a scalar graph, with no geometrical significance. That is to say, the curve of the motion (the velocity V) might be of any length whatsoever, depending only on the arbitrary choice of measures for the two axes.

However, the constant, c , of 300,000 kilometres to the second fixes the units of the velocity graph in such a way that with the vertical measured in units of 300,000 km (Fig. 1), the horizontal has to be measured in units of seconds. This gives to the graph and to the length of the velocity vector a *geometrical* significance which it never had in classical physics. To talk about the *length* of the velocity curve, in units of either 300,000 km or seconds now has a meaning which it could not have heretofore. The ‘graph’ of motion is therefore no longer truly a *graph*. It is a geometrical (*i.e.*, vector) *diagram* of motion, see Fig. 1.

Let V , then, be a uniform velocity ($V = s/t$) starting from the origin O of the diagram. The length of this vector from O is expressed, according to the Theorem of Pythagoras, as

$$\text{Formula (1)} \quad t_R = \sqrt{[(s/c)^2 + t^2]} ,$$

where t_R is the length which is the resultant of the two orthogonal measures, s/c and t . Since the dimensions of this formula are seconds, the length t_R , like the other variables in the formula, is a period of time. And since in the Machian paradigm, all these measures are *observational* (that is, the origin O in this case is the observer), there are, altogether, *three* observer-times to consider. One is the observed distance-time s/c travelled by the body in the reference-frame of the observer at O ; another is the time t , of the motion registered by the travelling body over the distance s , while the third is the resultant observational time, t_R of the same motion as measured by O ’s local clocks.

Now, while the velocity V in the figure is the classical, or Newtonian velocity, which is the velocity over the distance s measured by the body itself and whose upper limit is infinity (*i.e.*, unlimited), the *relative velocity* of the body, that is, the velocity measured in the observer time at O is no longer that classical V , it is the *relative velocity* $v = s/t_R$ whose upper limit (asymptote) is c . This can be seen if, for s in (1) we substitute the equivalent vt_R , which gives

$$\text{Equation (2):} \quad t_R = \sqrt{[(vt_R/c)^2 + t^2]} .$$

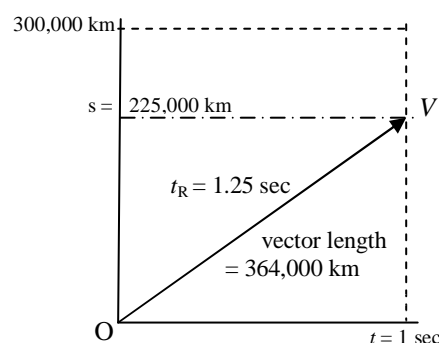


Fig. 1 relativistic time-dilation

Simplifying this equation produces

Formula (3):
$$t_R = t/\sqrt{1 - (v^2/c^2)},$$

which is the familiar Einstein formula for time-dilation in Special Relativity. Thus, in these three simple moves, Mach might have obtained the same result as Einstein's, directly from Pythagoras without postulating 'light-velocity', 'electromagnetic waves', 'photons' or anything else, travelling *in vacuo*. This Neo-Machian derivation of Special Relativity is surely as mathematically simple and conceptually economical as it gets.

The Neo-Machian Physics Paradigm of Direct Action Stage 3, the Quantum

Here, again, is the (Pythagorean deduced) relativistic time formula:

(Formula 3)
$$t_R = t/\sqrt{1 - (v^2/c^2)}$$

In this equation it can be seen that t is the limit, or coefficient, of that equation. Of course, we don't know the value of that coefficient at this stage, since we are dealing, here, purely with numbers, so that values, so far, don't come into it. Now, mathematically speaking, all real numbers can be expressed as a ratio of integers, n/N (*pace* Diophantus), which means that in terms of pure numbers, t_R becomes $(n/N)t$. Thus, equation (4), expressed purely numerically, is

Equation (5)
$$v^2/c^2 = (1 - N^2/n^2).$$

Now v^2 in this equation is, dimensionally, e/m , where e is potential energy and m is mass. In these terms, (5) becomes

Equation (6):
$$e = mc^2[1 - (N^2/n^2)].$$

Note that in the limit of this equation, for $n \rightarrow \infty$ we have the familiar mass-energy formula:

Formula (7)
$$e = mc^2.$$

But now there is a difference. Unlike the Einsteinian formula, this Neo-Machian mass-energy formula is fundamentally *quantised*. That is to say, it predicts that on the microphysical level (for relatively small values of n and N , energy is released in quantum amounts through a series of fractions, $3/4$, $8/9$, $15/16$... and so on up to mc^2 as n/N approaches unity).

In terms, then, of pure numbers we have series and whole sets of series of energies as expressed in (6). In terms of intermediate differences, $e = e_1 - e_2$ this equation becomes

Equation (8)
$$e = mc^2 [1 - (N^2/n_2^2)] - mc^2 [1 - (N^2/n_1^2)],$$

which simplifies to

$$\text{Equation (9)} \quad e = N^2 mc^2 [(1/n_1^2) - (1/n_2^2)] .$$

The series of pure numbers in this formula is exactly the same as those in the Balmer-Rydberg formula for the frequencies of hydrogen and other hydrogen-like elements. In fact, dividing (9) by Planck's empirical constant, $h (= e/v)$, expresses that formula in terms of *frequency*, v , thus:

$$\text{Equation (10)} \quad v = v_2 - v_1 = N^2 v_{\text{lim.}} [(1/n_1^2) - (1/n_2^2)] .$$

where $v_{\text{lim.}}$ is the frequency limit or coefficient of the equation.

This, of course, is, as we have said, just a function of pure numbers. That is, it is a purely mathematical equation. For it to become a physical equation, the coefficient $v_{\text{lim.}}$ has to be given some empirical value. The only empirical value which fits the equation is that of the Rydberg constant, $cR (= 3.289842 \times 10^{15} \text{ s}^{-1})$. So we have, finally,

$$\text{Formula (11)} \quad v = N^2 cR [(1/n_1^2) - (1/n_2^2)] ,$$

which is, precisely, the Balmer-Rydberg frequency formula, deduced from first principles, as contrasted to that of Balmer, which was produced simply by trial and error.

In principle, then, Mach could have predicted, in this way, not only the standard Einsteinian mass-energy relation $e = mc^2$ but also the quantisation of that energy in amounts manifest in the frequencies of the atomic light-spectrum. In the Neo-Machian formalism, therefore, there is no conflict between Relativity and Quantum theory of the sort that has plagued Modern Physics with its plethora of contrived theories seeking to explain the inexplicable. By contrast, in this alternative Neo-Machian paradigm the two theories, of relativity and the quantum, are inseparable. It might thus be truly said that as well as being a theory of *relativity*, the Neo-Machian theory is also, automatically, a *quantum* theory. In fact the Neo-Machian theory is a theory of *Quantum Relativity*.

The Neo-Machian Physics Paradigm of Direct Action

Stage 3. General Relativity

In Mach's physics, the idea of space as existing in itself, apart from matter, is nonsense. What dimensions would that space have, what size, what density? Would it be large or small, moving or stationary? These questions would have been meaningless for Mach, as also would any talk of events and processes *in vacuo* – because, of course, wherever there are events and processes cannot be truly called a vacuum.

Moreover, any events and processes have to be *phenomena*. That is to say, they have to be observable, physically manifest in some way. Any notion of things existing and going on behind and beyond any possibility of physical detection was anathema for Mach. This, of course, is why Mach could not contemplate the notion of light travelling invisibly *in vacuo* in the way his protégé, Einstein did.

The same applies to the *in vacuo* ‘field’ and ‘field forces’ of mainline physics. What is conspicuously absent, therefore, in the Neo-Machian paradigm are any postulates of *in vacuo* force-fields, of ‘gravity’, ‘electrostatics’, ‘magnetostatics’ or whatever. What is it, then, that holds things together, which attracts them towards and repels them from one another in all those ways which are physically observed?

But what *is* it, really, that is physically observed? When we look out into space, what do we see? We don’t see ‘space’, we don’t see ‘gravity’ and we don’t see light ‘travelling’. What we see, directly, is the positions, motions and durations of objects. In these we also see *mass*, as the observed measure of the reluctance of bodies to change their motions in response to applied force. We also see *time* which, in the Neo-Machian, relativistic paradigm, is not the ineffable ‘God’s-eye-view measure of change in everything simultaneously throughout the universe but simply the observed measure of change in this clock or that clock – and everything that can be observed is a ‘clock[‘ in this completely empirical sense.

Moreover, what we do *not* see, anywhere, in the force-free or ‘inertial’ motions of bodies, is any case of straight-line trajectories of the sort that, in his imagination, Newton envisaged. What we *see*, everywhere, is *orbital*, *i.e.*, curved or non-rectilinear motion. Nor do we see any *in vacuo* ‘forces’ of the kind that Newton postulated in his Law of Universal Gravitation as an explanation of the fact that nothing moves in the way his First Law of (rectilinear) Motion asserts. In Neo-Machian physics these two alleged equally opposed *in vacuo* ‘forces’ of centrifugal and centripetal motion exactly cancel each other, so that the net ‘force’ on a free orbiting body is precisely zero. But *of course* we never *see* these opposing ‘forces’, since they negate each other. What we *see*, in the phenomenon of free orbital motion are, basically, the mass (m), the velocity (v) and the distance (r) between bodies in the automatically paired relation called *angular momentum*, the simplest case of which is that of an ideally circular orbit around a central large mass, M , of a smaller mass, m , like that of the earth around the sun or the moon around the earth. The fact that these orbits are not circular but elliptical is set aside here for reasons of simplicity, to be dealt with later, as they are in the POAMS publications.

For the moment, then, ideally circular motion will be sufficient to illustrate the Neo-Machian angular momentum alternative to Newtonian ‘gravity’. The fact is that angular momentum defines, in itself, its own space, time and motion with no need of any additional postulates, of ‘force’ or whatever. Its orbital motions are entirely force-free – that is, until that free motion is interrupted in some way, which requires the application of a real, measurable force, as we shall see, later. So we may start with the simple empirical (*i.e.*, Newtonian) equation:

$$L = mvr = GmM/v , \quad (12).$$

where G is the usual empirical (*i.e.*, practically measured) factor $6.673 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$. In this equation it can be seen straightaway that for any increase in L there has to be a corresponding increase in both mvr and GmM/v . Since G , m and M are constant, this means that for the increase in L the only measures that can change are v and r . In the right-hand expression, this means that v has to decrease, which means that in the middle expression, r has to *increase*. The upshot of this is that as the angular momentum increases, the velocity automatically decreases, while the radius increases. The only mechanical cause of this is the sort of *real* force that is applied tangentially to the orbit (torque), by a rocket engine, say, to increase the radius of the ship’s orbit in stages to send it off into space. Note that from equation (12) the radius r increases or decreases inversely by the square root of the increase or decrease in L .

Orbits described in these Neo-Machian angular momentum terms are exactly as described in the Newtonian ‘gravitational’ terms. However, there is one very significant difference between the two theories. This is that any *spin* angular momentum of an orbiting body has to be included in the overall angular momentum (orbital + spin). Thus the effect of spin changes the orbital parameters in a way that it cannot in the ‘gravitational’ theory, where the ‘attractive force’, depending purely on the mass of a body, is the same for that orbiting body regardless of whether or not it is spinning. This angular momentum explanation therefore predicts changes in the value of G , for orbiting bodies which are spinning, which are forbidden by the ‘gravitational’ theory.

The full mathematical details of this Neo-Machian account of orbital motion, circular, elliptical, constrained, *etc.*, *etc.*, have been worked out and published in the various books and journals listed on the POAMS websites. None of these developments, however, alters the principles propounded here, in this simplest of examples, so there is no need to discuss these more complex questions at this present stage, which would only confuse the issue of the radical difference between the Neo-Machian (POAMS) and the mainline (Einsteinian) approaches to modern physics.

The Neo-Machian Physics Paradigm of Direct Action

Stage 4. Orbital Time-Dilation

TEXTS OF THESE STAGES 4 AND 5 ARE LOST.

FOR THE START OF STAGE 6, SEE BELOW.

The Neo-Machian Physics Paradigm of Direct Action

Stage 6. Unified Field

The mainstream approach to solving the Unified Field problem is to take the various historical field theories ‘off the peg’, as it were, and try to put them together in a unified way. From the Neo-Machian point of view, this is like trying to make a single jigsaw-puzzle picture out of several different ones. The only jigsaw puzzle that POAMS seeks to solve is not that of combining all the different theories but that of logically combining *phenomena*, the pieces of the puzzle presented by nature itself.

In that case, the ‘Unified Field’ problem is solved at source, which is by dispensing with ‘fields’ altogether.

DISCONTINUED HERE DUE TO MEDICAL PROBLEMS

Notes and References

¹ A main source of confusion is that some critics have demanded, at the outset, ‘experimental evidence’ for the choice of the Neo-Machian interpretation of c . The only ‘evidence’ for that choice, however, is negative, that is, the persistent lack of any known way of seeing or detecting light ‘travelling *in vacuo*’. In any case, the fact that there is no logical contradiction in starting with this different interpretation of c has been lost on these

'experimentalists'. In vain has it been pointed out that just because all velocities are distances divided by time it does not logically follow that all distances divided by time are necessarily velocities, hence that this logical alternative remains to be explored. An unfathomable inability to understand this simple logical argument has been the cause of much acrimonious reaction (see following, Footnote 4.).

² N,V, Pope and A.D. Osborne, 'Instantaneous Relativistic Action-at-a-Distance' *Physics Essays*, Sept 1992, pp 409-421.

³ Published by Nova Science Inc., Commack, N.Y in the Contemporary Fundamental Physics Series (Series Ed. V. Dvoeglazov). 1999.

⁴ See, on Internet, the New World Synthesis thread of the BAUT group forum: Bad Astronomy and Universe Today Forum > Space and Astronomy > Against the Mainstream > the speed of light, is it infinite Also: POAMS: The New World Synthesis by Viv Pope et al.

ENDS