

# SHAPE JOURNAL

WHAT IS TO BE DONE?

COLLECTED BLOG SERIES ON MARXISM LENINISM AND SCIENCE  
INTERDISCIPLINARY STUDIES / MARXIST AND HEGELIAN DIALECTICS / REALITY EVOLVES / HOLIST SCIENCE



## What is to be done?

Issue 42

Introduction

- I. Epiphany, Activism, Election and Expulsion
- II. Political Stance, Campaigns and Theory
- III. Philosophy, Researches & Zeno
- IV. Inter-disciplinary Studies, Dichotomies & Eye-Brain Interpretations
- V. Technology, Science's Source & Method, Plurality and Holism
- VI. Contradiction and Abstraction
- VII. Explanation-or-Use, The Crisis in Physics, Reality Evolves
- VIII. Revolutionary Change, Marx & Hegelian Dialectics
- IX. Outstanding Tasks, The Holist Stance
- X. Emergences, Breaking from Old Ideas, Tackling the Problems
- XI. Universally Applicable Theory, Science, Explanation above all
- XII. The Fight Back, a Physical Ground

## Introduction

### developing marxism today



This issue collects all 12 parts of my *What is to be done?* blog series, originally written as a single 15,000-word paper back in 2008. This was an important milestone and preceded literally all the later significant theoretical developments by this Marxist theorist.

Nevertheless, it was, and still is, an attempt to deliver a comprehensive approach, by a modern-day Marxist, to the significant problems that were then considered to be still outstanding in both Philosophy and Science.

The credentials of this writer, that you may consider are appropriate to the task are that I am a professional scientist, in fact, a retired Professor from London University, and a lifelong, active revolutionary socialist. So, the subject will be treated professionally, and its validity will be proved by the analytical power revealed by its wholly new contributions.

It will not be an historical narrative, but a current, urgent development of Marxist Theory!

The paper was always an important attempt, in spite of its evident omissions, because, nevertheless, its completion went a long way to defining, "What is to be done!" But, of course, it will only be by the subsequent successes of the new approach that it will, and should, be judged.

For the author's *Theory of Emergences* was only formulated two years after the completion of this paper. And the scientifically significant *Theory of the Double Slit Experiments* in Sub Atomic Physics was also only begun during the writing of this paper, and finally formulated the following year.

So, why not just deliver those completed theories?

Well, they certainly require some sort of grounding, without which they will not inform and empower the reader.

This chosen work is being republished here, because of what it does achieve in establishing the necessary agenda and ground. The intention was not to merely add the current "Works of the Masters", but to encourage potential Marxists to actually join the fray. For the task, being applied to a living, changing World, is clearly never ending!

**Jim Schofield**  
Nov 2015





## I. Epiphany, Activism, Election and Expulsion

Having become a sort of Marxist on purely intellectual grounds, aged 19, while a student at Leeds University, it was clearly immediately necessary for me to learn a great deal more, and, of course, to actually find out what such a conversion, and indeed commitment, would entail politically. It wasn't immediately evident what I should do as I was totally unaware of what politics was, and did not arrive at my decision for political reasons, but as I have said, for purely intellectual ones. I considered that I had merely "found" a means whereby I could begin to understand the World, and commence the necessary ascent to make full sense of things, and why these were the way they were.

I, of course, read crucial texts such as "The Part played by Labour in the Ascent from Ape to Man" by Engels; "Materialism and Empirio-Criticism" by Lenin, and "Ten Days that Shook the World" by John Read, and anything else that seemed appropriate. I was hooked! But what then must I do?

I joined the Communist Party! Where rather surprisingly, I wasn't asked to DO anything! There were discussion groups and votes in the Students' Union, but little else. It didn't seem to be a very active sort of commitment. So, off my own bat I persuaded the local "Librarian" of the Party to supply me (on sale or return) with some books to sell on a weekly stall within the Union Building. After a slow start the interest began to pick up, and assuming most political people were like me, I filled the stall with whatever I thought would interest my fellow students.

In a very short time the stall had expanded and was doing good business. I obviously had read what I was selling, and could advise potential customers as to what they may read. A typical example was "A Painter of Our Time" by John Berger, which had been remaindered, but of which I spoke so highly that I was able to sell all the stock that the Party could supply. But as to real political activity, there was none!

Now, the clients for my stall were by no means all Party members. Indeed, there wasn't that many among the students. The majority were Socialists and many professed to being Marxists, but they certainly had

differences with the Party itself. I'm afraid I was in no position to either inform them, or to argue with them, so the conversations around my stall were mostly about the books available there.

Among my "customers", another tendency began to take my eye. They were also Marxists, through and through, but insisted that they were the true inheritors of Marxism. They were Trotskyists. And it soon became clear that there was no shortage of political activity within that Grouping, though it was still limited to the Student Body only.

At an important Debate in the Student Union, which was, as they say, "totally packed out", the speaker for these Trotskyists trounced all other participants with his arguments and political position. This was more like it. I, thereafter, went around saying that I was a Trotskyist. Please remember I was only 19 and had never come across any of these things before. My parents never mentioned politics (but voted Labour), and not a word was mentioned by anyone at the Grammar School that I had passed my Scholarship to attend.

My idea of political activity was to support these Trotskyists on votes within the Union, but I didn't join! No body even asked me to, and I knew no-one among my fellow students who even professed to be a member. The surprising thing was that though activity within the Union was prodigious it was also remarkably limited in scope- so much so that any Tories that were about had to hide, or pretend that they were some sort of Socialist. [It was, after all, the first generation of Working Class youth to get to University in any sort of numbers, and Leeds was an obvious place for these "new students" to be accommodated. And they certainly dominated proceedings there. What had been the sole privilege of the Middle and Upper Classes was now open to the "cream" of the Working Class and they grasped it with both hands. The Vice President of the Students' Union was a Communist, and he had been elected by the Student Body, and captured their support, so Left Wing Politics were everywhere and seemed to include everybody. This was 1959.

But, not a single worker was in sight.

On finishing my Degree and moving to Leicester to do what was termed a Cert. Ed. (after which I would be able to work as a teacher), I was pleased to have two political friends from Leeds there along with me. One was a close friend who had been in the same “digs” as myself for the last two years at Leeds, and the other, it turned out, was a committed, and well informed Trotskyist.

He KNEW what had to be done.

His group had developed a position to recruit working class youth into politics, and the method had been worked out as the so-called Entry Tactic. This involved entering the Labour Party (as the usual party of the British Working Class) and there to build its youth section – the Young Socialists into a Marxist and Revolutionary Youth Movement.

We quickly joined him in this endeavour, joined the Labour Party AND became members of the Trotskyist tendency – the Socialist Labour League.

Starting initially with tiny meetings at Labour Party Headquarters in the City, we soon moved out to where the Youth were situated. The tactic was extremely successful, and how could it be other? We worked exclusively on the working class estates and provided facilities that no-one else would. We were soon running Youth Club type meetings all over the city, providing Dances and Football matches, but with a clear unapologetic anti-Tory standpoint, and obviously commitment to the Working Class.

By 1964 we had grown nationally to have as elected members of the National Committee of the YS, 10 out of 12 of the country's Regions, and the National Secretary was also one of us. And a General Election was nigh!

In the Election Campaign we gave the Tories hell. We followed them about the city disrupting their meetings and condemning their policies. They couldn't get a word in edgeways. We regularly sold our newspapers outside Factories at the crack of dawn, and spent most evenings doing the same in Working Mens' Clubs and in pubs.

Within a short time we were all expelled from the Labour Party, for such reprehensible and underhand activities. But they were too late! We took the bulk of the Young Socialists with us. Interestingly, all other Trotskyist tendencies were not expelled, neither did they join us

outside the Labour Party, they remained in what had to be renamed as the Labour Party Young Socialists. Of course, you can see why. The Young Socialists was now clearly the Youth Movement of the SLL, and the other tendencies were not going to subordinate themselves to that organisation.

Within a short time the SLL became the WRP (Workers Revolutionary Party) and managed to produce a Daily paper – the Workers Press, while continuing to build the Young Socialists. By 1968 we had organised a major intervention in the International Anti-Vietnam War demonstration in Liege, Belgium, and even raised sufficient money to hire a ferry and a train to take a large body of youth to this significant Demonstration.

But, in spite of so-called Education Classes, little or NO further development in Marxism took place. A same-age peer of mine from Leeds University soon came to the fore as the Economics expert, but he had had the same “education” as I and though he was a great bloke, you could not say that he was advancing Marxism (just as I wasn't of course!).

On the other hand, the theoretical preoccupations of the Party were understandable, but deadly. They were essentially retrospective and defensive against Revisionism. The failures of the First, Second and Third Workers' Internationals had been due to this middle class cancer, and were just too pernicious to allow to flourish yet again. So in the Fourth Trotskyist International, there was no doubt that the latest variety was in danger of repeating the demise of that organisation too. The biggest party in the world was the American Party, and it had focussed in on a “Hands off Cuba” Campaign, which left most of the crucial tasks unattended. Single issue politics were rapidly growing and they decided to join the rush.

But, internecine fights could NOT be the answer to the necessary theoretical developments of the Party in the UK.

## II. Political Stance, Campaigns and Theory

### Anti-Revisionist or Marxist?

We were supposed to be Marxists! And that meant that though we could not ignore the enemy within, the esoteric arguments were simply insufficient to equip us for the many more important fights to come. The main theoretical strategy MUST be, what it has always been - that is to be active present day Marxists, advancing the body of Theory, and continuing to outstrip all major non-Marxist tendencies in interpreting ALL aspects of the World, and on the basis of this, formulating the correct paths to further work.

There was a major disadvantage however.

England had been a major imperialist power for centuries, and, as with present day Americans, this led to an anti-theoretical, and self-confident pragmatism, which really was very impatient with Theory. The idea of locking yourself away in the British Museum Library to crack important theoretical questions was certainly anathema to the British socialists I knew. In addition, it was certainly very difficult to recruit the best minds, and keep them, when our Theory was not trouncing the opposition with its mainline to Truth. It must be admitted, we didn't have the people for the job! There were many good and committed comrades, but clearly no-one of the intellectual power of a Lenin or a Trotsky to help.

We had, quite correctly, turned to the only potentially revolutionary force within Society – the Working Class, and its vanguard – the Youth, but we won their respect with our energy and activism, and NOT by our penetrating and inspiring Theory. Most members seemed to get by totally without any discernable Theory, requiring only a clear task list to keep them busy. The decline of the organisation was inevitable. It didn't deliver what it seemed to promise.

In spite of a series of excellent campaigns, such as the support of strikes throughout the country, these never coalesced into anything bigger.

I well remember my own intervention at a factory near Leicester, where most employees were Indians, and could only keep their jobs by paying off the foreman. I got a full report into the paper, and sold it outside from early in the morning till the whistle blew for the end of the shift. Workers were coming out in droves to buy the paper, and all hell had broken loose within the management. The foreman was sacked and the protection racket ended. But, this excellent intervention led to no new recruits or support for our other ventures in the city. Our activism did NOT have an effective transition strategy: it was an end in itself!

The Workers' Aid campaign, to support the miners of Bosnia-Herzegovina, though conceived of and organised by a Serbian colleague, did not develop into a continuing movement. We seemed to be slipping into single-issue politics like everyone else. The party began to lose its famous members and generally shrink and even split. In the end most of the best people had left, and at the present time, it has effectively ceased to exist.

I was involved actually in political work in and around this organisation from 1959 to 1986, but for the last 10 years of this period I was no longer a member. In Scotland in the 1980's I set up Youth Training course for unemployed youth in Brighton, Glasgow, with the support and occasional presence of Vanessa Redgrave, then still involved with the Party, but it was a yet another one-man show, and when I left Scotland for another job, it seemed to fade away.

And it had by then been long evident that there had been NO development of my personal grasp (or use) of Marxism. I was even occasionally reprimanded for asking questions at education classes, with the criticism that I obviously hadn't read the appropriate texts. I had, of course, but they had multiplied the questions, not addressed them – quite as it should be, if you think about it. The conception that you only have to read the words of the Master to completely understand things, is Error Number One, in the process of attempting to understand something. Indeed, I had probably read a

great deal more than anyone else in the room. My library at the time was around 600 books, and has expanded at a similar rate ever since. But you don't learn Marxism as a "given thing", you must "create" it, day in, day out! Theoretical activity is the most powerful weapon that we can have, and handed down formulae are insufficient. You have to "light up" the problems with constantly replenished Truth. But, such a conception was not evident to me within the organisation, and sadly within any of the other Trotskyist tendencies either (for I did read their stuff).

The period of the Thatcherite Reaction more or less put paid to the revolutionary tendencies as a force in Working Class politics. The citadels of working class strength – the Coal Industry, Heavy Engineering and Car Manufacture were dismantled, along with the rights of the organised working class. The power bases of the Class were deliberately dismantled, as long fought for Rights were taken away, and replaced by a "Tory-inspired democracy", and, finally, the capitalist, globalisation boom of the New Labourites seduced most workers into a frenzy of consumption.

But such periods are not unknown in history. They happened to both Marx and later on to Lenin. And what did they do, when faced with such periods? They used the lull in activity to concentrate on sharpening their essential weapons. They stepped up their theoretical work to being THE all-consuming task!

And, we must do the same!

Now, you might with justice respond with, "Are you doing this? What contributions have you made?" To which I must reply by saying that these are the right questions. And I must respond to them, and justify my position before I go any further.

Well, I wasn't well trained in this endeavour. I was aware of its necessity, but you always assume that others are much more able and qualified to take on such important tasks. So, my initial contributions were fragmentary.

Then, slowly at first in the 1990s, and thereafter, beginning to accelerate over the next decade, the tempo increased until today I work on theoretical questions 7 days a week, and 365 days a year. It is now all I do, and I have been working at this level now for over three years (by 2005 ed.).

Though my initial contributions were limited to my specialist areas, the experiences of the last couple of decades have forced a widening of my accepted remit, such that my work today is clearly interdisciplinary, and has led to some significant contributions.

Now, the activist will certainly still admonish me with, "So, you haven't been active in politics for twenty years, and yet STILL presume to be able to make a contribution to Marxism? Isn't that a contradiction in terms? Are you not just a classical bourgeois philosopher, criticising the World from the comfort of your "armchair-and-slippers" retirement?"

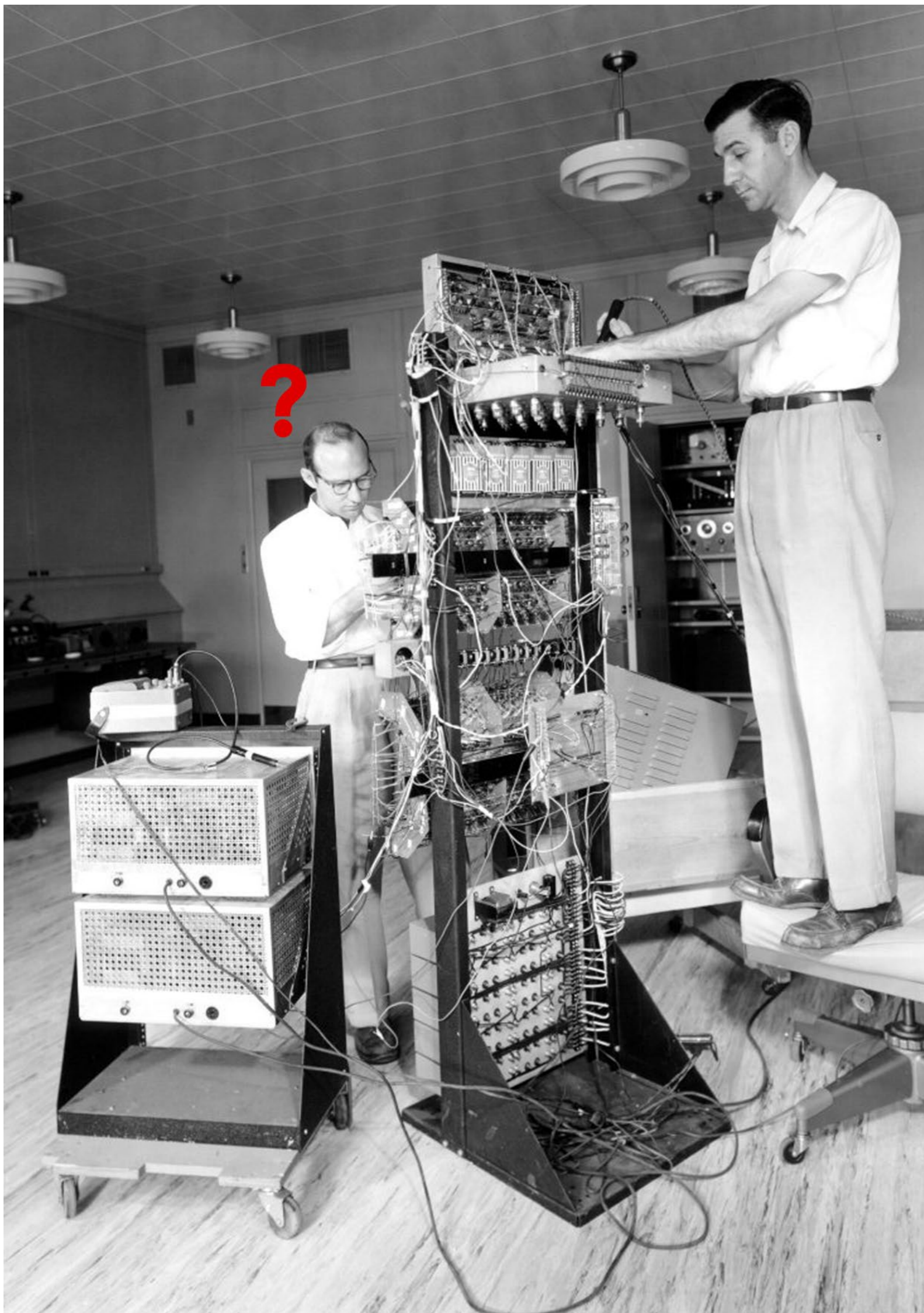
Well, no!

Perhaps I have missed out a few things in the trajectory of my life, which are perhaps relevant to this discussion. First, I have been a teacher, lecturer and finally a professor in London University, in a career spanning 32 years. I was a qualified physicist, but went on to teach Mathematics, then Biology, then Computer Science at levels ranging from Primary schools to Universities, in cities such as Leicester, Hong Kong, Glasgow, Bedford and London.

If you know about computer software, it may interest you to know that I wrote a Machine-independent Fortran compiler in the 1970's. In that same decade I built the first Community Computer Centre at a Further Education College in Leicester, which ended up teaching ONE THIRD of the city's Secondary Schools pupils for FREE, via Link Courses. I also in the same period set up the organisation CURE, which acquired and delivered (all for FREE) 25 mainframe computers to educational establishments throughout the UK. Meanwhile, I was also pursuing mathematical researches into Re-entrant tilings, and invented an infinite 3D strand, with re-entrant faces, which stacked together to completely fill space. This strand also was shown to possess great similarities with the general double helix for of DNA, and could be used as a former to replicate itself.

This work was appreciated enough for me to finally make the leap to Higher Education, when I secured a job at Hong Kong Polytechnic, and within a year had been promoted to Senior Lecturer. On my return to the UK in the 1980s, I secured a post in what is now Glasgow Caledonian University, where once again within 2 years I was promoted to Principal Lecturer and proceeded to set





up a support arrangement for researchers, which supplied tailor-made software for their research objectives, and which transformed the use of computers in control in research at that institution. My computerisation of a Gas, Liquid Chromatograph elicited requests for reprints from over 60 countries across the World. I also set up a dedicated educational system on a new mainframe computer, which facilitated submission, correction and return of written work by students, made possible by a secure system on the mainframe and the straightforward access of innumerable PC computers to the shared mainframe. To those who in 2008 consider this commonplace, may I point out that this work was completed by 1986.

On moving to Bedford, this time as Computer Manager for the institution which included Teacher Training, Degree level courses and Further Education within a single College. I started working with Jackie Smith (now Dr. Jacqueline Smith-Autard) to develop and publish Multimedia Resources for the Teaching of Dance, for which we received a BIVA award in 1989, and which has since led to 12 separate products, sold all over the world to all sorts of institutions ranging from Primary Schools to Universities. On moving to London University, where I was the Director of Information Technology (a professorial level post) at a College world famous for its teaching of the Arts, I was immediately in charge of, and commissioned, the first Campus-Wide Fibre-Optic Network anywhere in the University. This was up and running by 1992.

Now, this has been my academic grounding. You may balk at my long gone 27 years in active politics, and you may also feel somewhat hostile to my obviously purely academic career, but I know what I can do and have done it to the best of my ability throughout that career. I make NO apologies for the 46 years I have spent in teaching and research.

For we must remember that Marxism was never merely a series of recipes for political action. It was, and still is, a world embracing philosophy, absolutely necessary for addressing ALL issues in every sphere of human endeavour. Indeed, it was exactly that aspect of Marxism which conquered the World towards the end of the 19th century. It recruited minds of the very top quality into its ranks – because it delivered. Can we honestly say that it still does this today? It SHOULD! There is nothing to stop it, but it doesn't happen because Theory on the

Global and multi-discipline scale is no longer addressed by those who profess to be Marxists. All work is put into the overtly political areas, and the rest of our energy is consumed in political activism.

The final realisation of this crucial lesson was generated out of the problems that I encountered in a whole series of my non political researches. Let me show how what might be seen as totally irrelevant areas were lit up and made available for solution via the Philosophy of Marxism – or to put it more generally by Dialectical Materialism.

### III. Philosophy, Researches & Zeno

#### Professional Research

Let us consider a couple of my research areas. When I was teaching “A” Level mathematics in the late 1960s, I had to teach what is called The Calculus. This was a series of techniques independently and more or less simultaneously invented by both Isaac Newton and Leibnitz to deal with the mathematical study of Rates of Change. These covered all such situations in Reality, but are most clearly and accurately encapsulated by the series of relations involving Distance, Time, Speed, and Acceleration.

These are a closely related set: the rate of change of Distance with Time being termed Speed, and the rate of change of Speed with Time giving us Acceleration. Now relations between pairs of these variables could be experimentally studied, and the results fitted to standard forms available from Mathematics. But, it was soon clear that scientists needed to move between these various variables at will, and some natural relations required different selections from the set to deliver what was required. For example air resistance is related to speed, and so MUST involve that Rate of Change in its descriptive formula. So though Scientists and Mathematicians could manipulate the separate equations, they couldn’t convert one form into another. Such a process was NOT mere manipulation. A whole new level of conversion was found to be involved, but these involved the plotting of the pair of related variables onto Graph and thereafter to construct lines on the graphs which could deliver (by calculation) the required rate-of-change values. Various frigs (or short cuts) were found, but these just had to

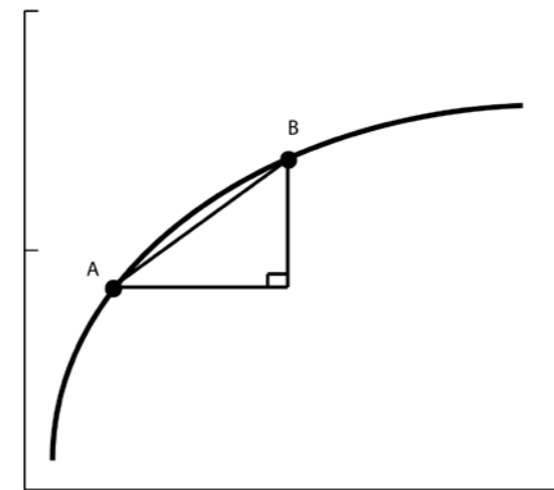
be remembered. What was needed was general method of doing these tasks covering ALL possible equations. AND, most important it had to be the job of a teacher to explain why these tricks worked, and even to supplying a general way of doing it for ALL possible cases.

The classic route is to plot out the given equation as a graph. For pairs of variables this was very easy to do, and students could follow the processes as demonstrated, but for any number of variables above two, the graphical method was at first difficult, and then impossible.

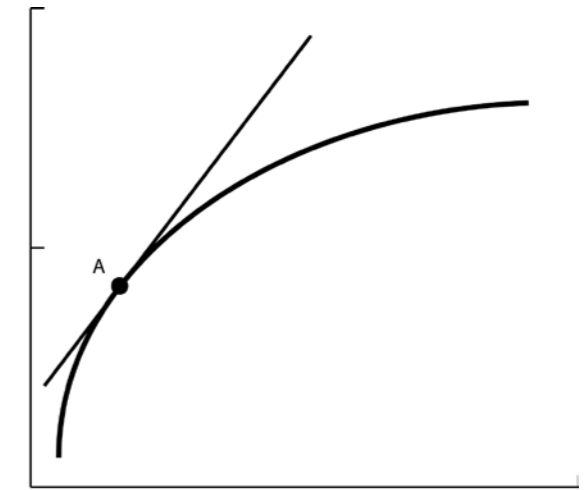
Needless to say most students did NOT like this area of Mathematics.

Let us see what was involved for just two variables, and then see how Newton and Leibnitz then cracked it for ALL cases. What was required was to find out the rate of change of one of the variables with respect to the other. For example we might require the change in Distance with Time - we were requiring the Speed!

Now such things were easy when speeds were constant, but if these were changing moment by moment they were seemingly unobtainable. It had long been the practice of Mathematicians to construct a straight line addition onto the graph at the point where we need the rate of change.



CHORD



TANGENT

Obviously, such a construction has to try to match the “slope” of the graph accurately, and a right angled triangle constructed with this line as its hypotenuse. The Tangent of the angle of slope would give us our required Rate of Change.

Thus, the instantaneous Rate of Change, at the given moment, was extracted from the graph. Also, it is clear that for every point where we required this information, this whole process would have to be repeated. This is a tedious process and needed to be replaced with something more accurate and quick.

What Newton did was to correctly assume that this crucial slope could be directly derived from the original equation WITHOUT all this geometrical construction and trigonometry. His researches discovered a manipulative technique wherein the “slope” of (say)  $y = x^3$  was shown to be  $3x^2$  at every point on the curve (i.e. for every situation covered by this equation). This led him (and Leibnitz quite separately of course) to a general form where for  $y = x^n$ , the slope would be  $nx^{n-1}$ . This general process was given the name Differentiation, and was expanded to cover all known formulae.

But why did this (and the following related techniques) work? Remembering such a trick was useful but NOT really informative.

Both inventors attempted to establish their manipulations by geometrical proof. It amounted to drawing a Chord between two points A and B, on the curve of the equation, and setting up a right angled triangle with these two points giving the hypotenuse of that figure.

The coordinates of the points at A and B could easily be used to find the lengths AC and BC and a very inaccurate estimate of the required slope (at A) could be obtained from that of the chord AB.

What happened next was philosophically very interesting. Both inventors assumed that perfect Continuity pertained for the given equation, and B could be brought closer and closer to A. As this happened, the calculated slope of AB would change, until it STOPPED at a final and accurate value just as the point B became coincident with A. At that precise moment, the slope of the chord AB would be identical with the slope of the curve at A.

But, there was a problem.

At this final situation the triangle used to calculate the slope completely vanished, so that the slope at A (the Tangent of the angle at A) became  $BC/AC$  which was  $0/0$  (A and B were the same point). But surprisingly the slope didn’t vanish too. It actually reached its correct finite value. But how could we find it from  $0/0$ . Both



inventors were able to establish, theoretically, the final form of each Differentiation from this construction, but it certainly posed important questions. Their modified versions after differentiation worked well, but they had only demonstrated rather than proved why this was the case. The whole idea of  $0/0$  being all sorts of different and finite things seemed WRONG. Our mathematicians had come up against the consequences of the assumption of Continuity.

Indeed, this anomaly was merely swept under the carpet, and students were told just to remember the frig to get the right answers. But, it was, of course, very unsatisfactory. The mathematicians had used an argument, which they had taken to The Limit, and without a clear justification conjured up the Right answer out of a simple Frig. The students naturally wondered why I had bothered to point out this situation. “Surely”, they insisted, “if the correct answer was obtained, then what could possibly be amiss?”

So, I asked them to consider the division of things in general into smaller and smaller pieces. “Could this go on forever?”, I asked. The answer was clearly, “No!” So I proposed that the assumption of Continuity was only OK, so long as we remained within the limits of Applicability of an equation. Indeed ALL equations had this limit, and would fail if it were transgressed. They began to see that Mathematics was NOT absolute but conditional and limited.

It was an important lesson. All philosophies that attempted to construct an absolute picture of Reality based on Mathematics were simply wrong. Mathematics was NOT the essence of Reality, but a pragmatic and limited bag of practical frigs.

Now, for many years a similar discussion had been going on in Science (or more precisely in Physics) as to whether everything studied was similarly perfectly Continuous. But researchers kept finding discrete particles, which could never be shoe-horned into a conception of total and universal continuity.

The assumptions of Newton and Leibnitz could be wrong! The assumption that perfectly continuous equations covered all of Reality came into question.

Now, this everyday pair of assumptions: “Reality is Continuous” and “Reality is made up of Discrete

fundamental units”, had been first revealed 2,500 years ago by Zeno of Elea (in ancient Greece). Zeno was so taken aback by the consequences of these two assumptions that he designed a series of Logical Paradoxes to show that BOTH of these assumptions led to contradictions when used in the study of Motion. No-one was able to refute the towering logic of his case. Indeed, they didn’t even know what his purpose was! They thought that he was saying that Logic is impossible, whereas, of course, he was saying NOTHING about Logic as such (indeed he himself was using it to make his points). He was, on the contrary, attempting to draw attention to our underlying, everyday assumptions that were the basis for subsequent logical arguments and derivations. He proved that the Foundations for our Logic were both man-made and inaccurate.

Needless to say, I taught Zeno to my A Level students and Mathematics was set alight!





## IV. Inter-disciplinary Studies, Dichotomies & Eye-Brain Interpretations

### Research in Movement

Many years later, I was developing Multimedia Resources for the Teaching of Dance (mostly Ballet and Modern Contemporary Dance). The main reason for this methodology was that we considered that the very best exemplars should be used at every level, and these could only be available in recordings. We also needed to intervene in any recording with perfect control plus easy and accurate access. A teacher HAD to be able to go directly to the movement she was teaching, and once at that moment to sensitively control its playing, with repeats and loops and slow motion. The DYNAMICS of each and every movement had to be precisely delivered, whatever way we were allowing its manipulation.

We therefore could NOT use Video Tape as the necessary access and control was too tedious and frankly impossible to effectively use. So we used Laser Disk technology. These contained a series of concentric tracks, each one containing a single 1/25th of a second frame. BUT, vitally these frames had been captured in an Analogue way. Moments from EVERY part of that 1/25th of a second were present within each and every frame. We had chosen Laser Disk for its controllability, but we had also chosen the ideal medium for delivering perfect movement dynamics.

We devised sophisticated and powerful Access & Control methods, which our users picked up in seconds and used with great power and subtlety to reveal the very essence of the movements.

The system worked like a dream and we won a British Interactive Video Award (BIVA) in Brighton in the Autumn of 1989.

The system worked extremely well, but we didn't know why until we were required to do the same sort of processes using the "latest thing" – Digital Video. It turned out to be impossible!

I had to STOP the authoring of the new Multimedia Pack and find out why it didn't work. I wonder if you can guess the reason for its inadequacy? It was Digital, hence though it still built movement out of 1/25th of a second frames, these were very different. They were each frozen STILLS. There were a series of such stills, each of which were held for 1/25th of a second and then replaced by the next still. All dynamics had been lost. Such a technology was fine for animation and fantasy, but Reality in movement was IMPOSSIBLE. After a long diversion researching the problem I was able to reveal the reasons for failure resided precisely in the "new" technology. It just could not cope with detailed analysis of movement. Indeed the movement NOT covered by the separate individual frames – indeed totally absent from the recording amounted to over 97%, and a fast moving hand could move (totally unrecorded) almost a yard between frames. I checked on sports events using digital cameras, and was amazed at the record of Paula Ratcliffe winning the New York marathon – there were only THREE positions of her arm in the record of a single swing, and, of course, such a movement was particularly slow. Imagine trying to study the dynamic detail in a delivery by a fast bowler with such an inadequate technology! Slow motion was a farce, and the dynamics of subtle movement always totally absent. No wonder it didn't work!

You will have noticed, of course, the occurrence of the very same problem as I have mentioned several times already. Once again, we have a pragmatic solution to representing movement in terms of discrete moments – Discreteness was being used where Continuity turns out to be essential!

The information delivered by Digital Video for human vision and interpretation, which was to be used to recreate actual movement was clearly totally inadequate to the task. The only interpretations possible were crude and simplified extrapolations between inert stills.

But Dance, like Music is packed with subtle accelerations and decelerations, which deliver the Art involved, and these were crucially entirely absent!

So, why did the old alternative, Analogue Video, work so well, while Digital Video was useless?

Without going into the fairly complex detail of the results of my work, what I discovered was that elements from the whole of the 1/25th of a second duration of a frame were indeed present in the analogue version as a sort of “smeared still”. But, when you looked at such a frame in isolation, it appeared confusingly blurred and seemingly entirely useless. The Digital Frame in comparison was completely crisp and clear.

The universal consensus was (and still is) that ONLY the clear, focussed images available via Digital stills could facilitate the serious study of movement. And of course, in one respect they were correct. For while accurate, positional information could be extracted from a Digital Still, no such useable positions were possible from the smeared, Analogue alternative. But the myth was that widely spaced crisp positional information was sufficient to deliver the actual dynamics of the movement involved.

It wasn't and never can be.

It was the age-old myth that precise numeric information is everything. In movement, that is never the case. The subtle variations in functional movement – the DYNAMICS – is what delivers the real content, and Analogue “smeared stills”, when delivered as a MOVIE, was the only way to deliver that. The very fact that each and every smeared still contained something from every moment of the frame period made it possible for the human Eye/Brain system to correctly interpret the movement. There can be no doubt that the analogue version was ideal for delivery in sequence, and also that our human facilities were ideally equipped to extract the maximum from that seemingly blurred and useless record.

I could go on and explain what could be delivered by slow motion, by looping and by many other techniques, but suffice it to say that on ALL these counts Digital was useless and Analogue was supreme.

Though, I have to admit, that I am in a minority of ONE in taking this position. The voluminous data from digital frames stills seduce the majority of “experts” in this field.

Do you recognise the SAME problem as we saw earlier in the Calculus and in Zeno's Paradoxes?

It was, and is, the problem of Continuity and Discreteness once more!

Believe it or not, we solved the problem.

I will NOT burden you here with all the details, but suffice it to say that we, that the work led to the appropriate delivery of dynamics and even to the design of an entirely NEW camera for recording and studying movement, which I have called the Twin Movement Camera.

This may seem a long way from Marxism, but it is at the philosophical heart of it!

No-one else had even noticed what was being lost, and still the Digital avalanche continues unabated, and experts use Digital cameras to analyse movement in Sport and many other areas without discovering the inadequacy of their chosen means.

In contrast, a Marxist working alone, without either funds or facilities, cracked the problem, while literally thousands of scientists working in this field world-wide have failed to do so.

The legacy of this research continues in the current work by Bedford Interactive, and their pioneering software FORMotion.

If you think that the correct interpretation of movement in Ballet is resoundingly unimportant, may I change tack completely and go on to questions concerning the Nature of Reality and the universally accepted methods of Science to further my case?

## V. Technology, Science's Source & Method, Plurality and Holism

### The Technological Revolution

For several hundreds of years, Science has been flowering and equipping Mankind to investigate Reality, and bend sections of it to his own purposes. The modern world is the proof of this progress. But we must see why the tremendous series of advances have taken place. What was it in the Scientific Methodology that opened up the gates for such technological development?

Ask a scientist, and he will correctly tell you that the starting point was the turn to Experiment that vastly increased our Knowledge of Reality. So instead of mere discussion and Logic being the ONLY route to Truth, scientists insisted on carefully designed experiments to extract vast amounts of quantitative data, which could then be fitted up with pure mathematical forms for the purposes of reliable and useable predictions.

### Measured Data as Primary Source

We must look much more closely at this process, for it is based on very ancient and well established premises, BUT applied for the first time with the possibility of control.

This ancient idea is termed Plurality, and involves seeing everything in the world as composed of Parts – indeed Plurality can be defined as “The Whole and the Part”. In spite of innumerable connections, mediations and determinations of all things with everything else, it is usually the first step in studying something to conceptually isolate it as an easily identified Part.

We Name it, and observe it with great care, to then move the same process on to identify its component Parts in turn.

Such a process historically usually didn't get very far, because so many things were simultaneously involved. You couldn't see the wood for the trees! Indeed, many crucial and causative factors were well hidden, and sometimes totally invisible, so such an undertaking

frequently collapsed under the weight of multiple competing and hard to assess factors.

### The Scientific Experimental Method and Use

But, Science finally appeared when sufficient was known to allow the absolutely essential control of a situation to maintain well defined and limited situations amenable to detailed study. The investigators “held down” as many variable factors as possible in any given situation to reveal ONLY a couple of variables free to change and openly display their mutual relation. Only when this sort of experiment could be carried out was the possibility of a Plurality inspired Science possible. This was the breakthrough!

But, we must be very clear, an experiment is NOT a mere hands free observation of Reality. Quite the reverse! It first involves the process of isolation of the identified Part to be studied – both conceptually AND physically.

Now what was being achieved is that the scientists were artificially revealing a hidden (or at least obscured) relation within Reality for detailed and easy study. For the first time such relations were “made available” AND subsequently “matched” to Pure Relational Forms – mathematical formulae, which had over many years been extracted from Reality in a piecemeal way. But, they were ALWAYS definitely purified forms. Their “independence” was never established as such. for they never occurred alone in nature.

Now, with the possibility of such experiments and extractions, accurate prediction was for the first time possible! And this led very quickly to purposive production. As long as the required and comprehensive Control was maintained, the derived “pure” formulae proved to be most definitely useable.

This whole extraction process can be most accurately encapsulated in the phrase isolate, extract and abstract.

### The Fly in the Ointment

But, we must NOT assume that Mankind had discovered the golden, solve-everything methodology. He hadn't! Experiment was a prodigious step-forward, but it both delivered and determined a particular direction of subsequent development. And, it cemented into our consciousness the erroneous Principle of Plurality. This leads to the conclusion that everything is composed of Parts, which can be successively investigated, from sub-Part to sub-Part, all the way down to fundamental particles (or whatever were to be the irreducible minimal units of construction of Reality).

Reality was thus seen of as composed of a multiplicity of Parts. ALL phenomena were seen as a mere complication of successively more basic elements.

The full content of the World could be revealed by this magnificent Method! Thus, the Laplacian Concept of the nature of Reality was born! If we knew the positions and speeds of all the particles in the Universe, then the whole future could be accurately predicted in full detail and with certainty.

THAT, of course, is the flaw in this Methodology. And we must explain why that is the case!

### Reality is not Pluralist: it is Holistic

Such a conception is an error because Reality is NOT so mechanist! For Reality includes Life, Consciousness and Evolution. To limit it to mere mechanist complication alone is a farce! Indeed, contrasting diametrically with this conception [Plurality] is the totally mutually interconnected and mediated alternative [Holism].

There are many version of this approach; the most famous is certainly that ascribed to the Buddha, 2500 years ago, but frequently revived by many thinkers throughout history. These people all see Reality as a much more self-referenced system. Rather than mere mechanist complication, this approach sees, from the very outset, constant Changes and development, generated by the myriads of possibilities inherent in the totally interconnected and mutually mediated elements in ways that in the end defy ANY mechanist analysis.

Reality via this view becomes an unanalysible Whole. All analyses that we attempt to make are totally compromised, because we cannot encapsulate the limitless content involved.

Now, though there is profound Truth in such a view, it is hardly USEABLE to control and direct aspects of Reality to our chosen ends (except by an all-powerful God, of course!) It results in an essentially passive, contemplative approach favoured by hermits and holy men, BECAUSE it can only be an infinite process. The focus cannot be objective in any way, but only subjective – that is based on the individual.

Thus in these alternative approaches, we have the classic quandary! How do we intervene, understand and use aspects of Reality, while maintaining a truer holistic conception of its Nature?

Let us see, as clearly as possible, what it is that we are doing in our process of Scientific Experiment! The reason for the success of Experiment is that it modifies a part of Reality in such a way that the modified part is amenable to study.

Instead of hoping to hunt a totally wild animal for food, Mankind turned to controlling the herds via animal husbandry. THAT is the essence of the new slant - change reality in order to control it.

In the same way Mankind slowly got the wherewithall and the power to corral pieces of Reality, and thereafter study them in detail WITHIN the his erected confinement! The process certainly changed the studied Part as compared with the naturally embedded position within Reality, BUT he conceptually both excused and applauded this by conceiving of Reality in a new non-holistic way. Reality became a multiplicity of man-made corrals, rather than an integrated Whole. He had purposely changed Reality to FIT a version of Plurality. Mankind had learned how to deal with Reality so that it conformed to the Pluralist Principle – It COULD be conceived of as a summation of separate Parts.

### The Pluralist Solution – Farming Reality

By his isolation, extraction and finally abstraction of individual relations, he conceived of what he was doing as eliciting the Essences of Reality. He now had a method of investigation AND an overarching theoretical framework, which “together” would enable him to conquer the World (part-by-part of course).

And effectively, this WAS sort of true! He did control, conquer and use broader and broader tracts of Reality, to the extent of having a powerful effect even on such enormous systems as the Global Climate of our planet.



# VI. Contradiction and Abstraction

## The Early Solutions

Now, in spite of the difficulties with the current pluralistic forms, they had emerged fairly late in the history of Mankind, and throughout that long, long “prehistory” Man had developed OTHER important views on the World around him. Indeed, sometimes Reality itself seemed to be organising against him, and a holistic attitude to Nature was unavoidable. In addition Man was an intelligent animal, who had learned to intervene with Reality in order to survive and prosper. His own necessarily purposive actions coloured his World View, and he felt the need to endow purpose to Reality itself. He expected causes, just as he himself was the cause of many things in his day to day life. Of course, this led to animism and ultimately to a God, made in his own self-image, but it also expected useable causes to be available for dealing with Reality in general.

## Contradiction Premise

Now this led to primitive “versions of philosophy” and “science” originally, and when Experiment finally arrived to invigorate his investigations, it also “accompanied” the experimental method as its “Explanation”. The tradition of looking for causes gelled with the extraction of relations and gave a meaningful narrative to those isolated achievements. Mankind developed Explanatory Science. But, this cosy idea of what Science became was a myth. Indeed, the experimental imperative was technological(?), whereas the explanatory imperative was surely scientific(?). These were NOT a perfectly matched pair!

## Abstraction

Some years ago I realised this and determined to investigate. For a long time I kept tripping over my own incorrect basic assumptions and getting nowhere. But I finally settled on the man-made process at the heart of all of these diverse things.

It was Abstraction!

I began to try to categorise exactly what Abstraction consisted of, and to effectively define it, started to conceive of the crucial Processes of Abstraction, and their resultant Products at various stages in a sequence of essential Abstraction Processes.

The task turned out to be prodigious!

For Mankind’s earliest conceptions were also abstractions, So, I began to attempt to construct a sequential list of the Stages of Abstraction used by Mankind in his attempt to comprehend the World.

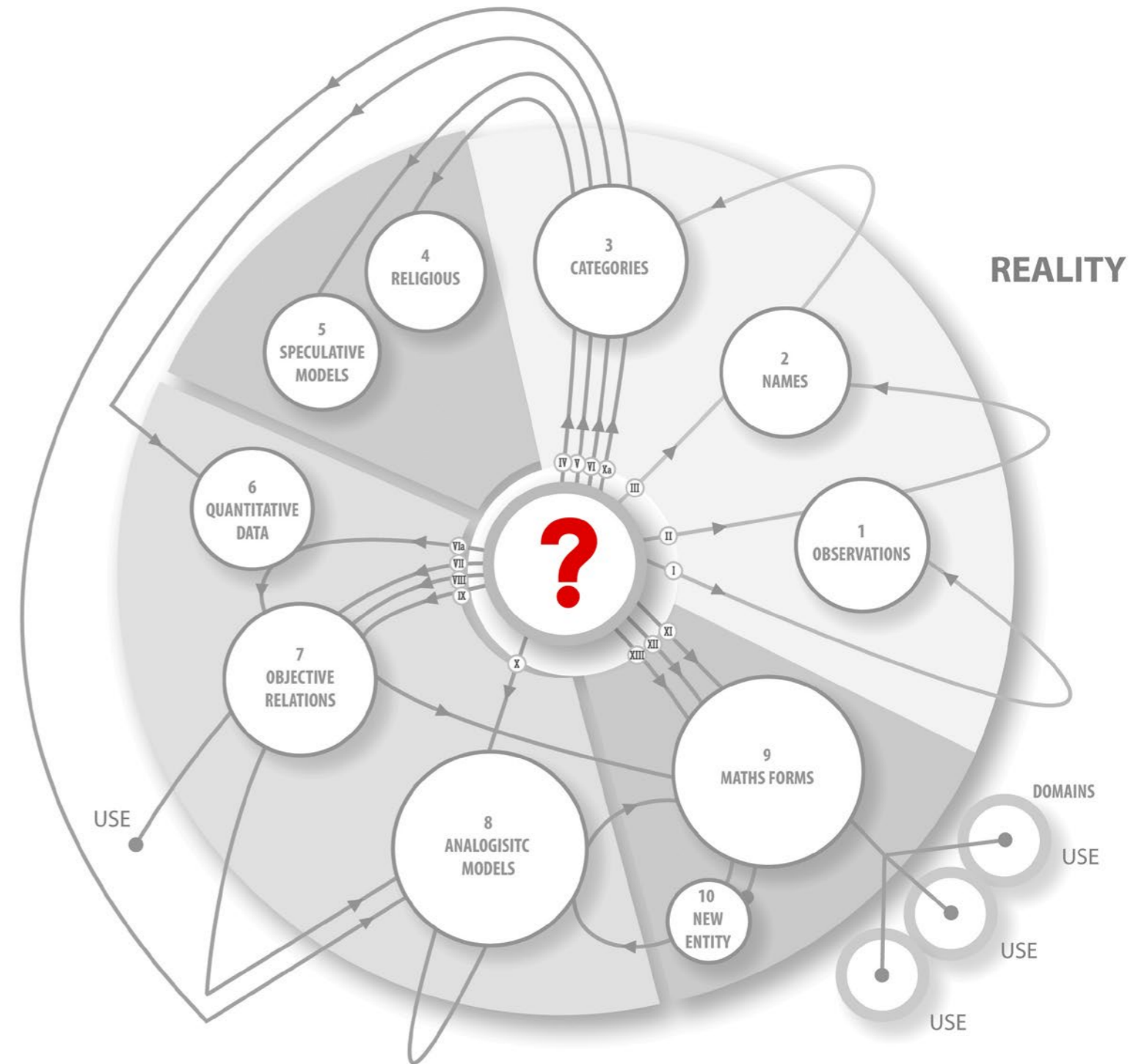
He certainly started with Observation, Recognition, Categorisation and a crude very speculative attempt at Explanation, but after the advent of Societies wonderful new forms appeared including Logic and Geometry.

## The Processes and Productions of Abstraction

Finally, with the rise of Experimental science, the first true Theories began to emerge.. [I have written a great deal on this, under the title of The Processes and Productions of Abstraction, which has even culminated in a general overall Diagram. This figure attempts to relate the whole area as a single system] We cannot attempt here to replicate the whole of this extensive research here, but its final diagrammatic Form can be useful, and is reproduced here.

Now we must never lose sight of the fact that Abstraction is a man-made invention. It recognises diverse things in Reality which display features in common, and attempts to concretise this commonality under an appropriate Category Title, whose Name, then represents that commonality.

Note: This diagram is NOT the latest version, nor can it ever be, as it is constantly being revised and improved. But for the purposes of this paper it should prove quite adequate.



Once more the usual dichotomies and difficulties occur, due to our assumptions and premises, and even in Thinking and Thought – more particularly Abstraction – the bifurcations appeared which clearly showed TWO diverging roads which seemed impossible to merge.

Without this necessary excursion expanding into a veritable “world tour”, let us just concentrate on this parting of the ways. A brief explanation of the Diagram will be necessary.

### Explanation of the Diagram

At the centre is the Active Element in the whole series of Processes – which is, of course, MAN, The background to the whole figure is, as it must be, Reality. While, in between these two there is an annulus containing the various Productions of Extraction – shown as labelled circles.

Between Man, Reality and the Products of Abstraction are the Arrowed Lines which represent the actual Processes of Abstraction. They too are numbered to both indicate their presumed sequence of use, and to allow them to be referred to precisely.

The earliest likely Processes can be seen to be fairly simple loops. From Man via Reality to the Product. Later the Processes take in previous Productions on route. For example: Man via Categories to Objective Relations The crucial Split occurs in the Science Region, where we have:-

*VII --- Man --- Objective Relations --- Reality --- Analogistic Models*

*IX --- Man --- Objective Relations --- Maths Forms*

Now, this is not a treatise on Abstraction, so the reader is asked to merely notice these TWO Processes.

Though the Process ending in Analogistic Models goes via Reality, and ends up within the Science region, the second alternative Process bypasses Reality and ends up in the World of Pure Form alone, which I have termed Ideality.

As you have probably guessed, I have highlighted these two because they reveal exactly where the most important problems arise. If we are to use our relations back in Reality itself, we have to go via this realm of Pure Form. Yet, it is a thoroughly laundered place. In it there is NO Reality, only Abstract Form.

## VII. Explanation-or-Use, The Crisis in Physics, Reality Evolves

### Explanation or Use?

We have a bifurcation between Explanation & Use. For literally centuries these were only used as a “team of horses” and clever scientists (like circus performers) learned to “switch horses” whenever necessary with remarkable agility. But the horses got bigger and more powerful and began to wilfully pull into their own “favoured” directions. The circus act became more and more difficult.

### The Crisis in Physics

In the early 20th century, the long established, classical explanations in Physics began to fail drastically in certain sub atomic areas.. The age old problems of Descretness and Continuity, first intimated by Zeno again raised their contradictory heads and the physicists were stumped.

They then did a remarkable thing.

They abandoned Explanation completely as unreliable, and plumped for depending entirely on their mathematical equations. This gave them prediction, so they could do things with their formulae, AND as these were Pure Form alone, these could be manipulated in any way they liked. AND used in Formal Proofs as well. Even Absolute Truth was available when only Pure Form was involved. So all in all their decision made life much, much easier.

The only “minor” difficulty was that you had to know which formula to use where, but such people were used to juggling – they just did it now SOLELY within the realms of Ideality (for perfect forms) and Reality (for Use).

### Mining Ideality?

But. Explanation was never a mere luxury. The bran-bin of Forms just got increasingly packed full of separate, unrelated alternatives.

Some co-ordinating narrative was STILL essential to guide our disembodied maths-manipulators through a still-there Real World. They couldn’t admit defeat and return to Explanation in the old sense, so they turned inwards to their maths formulae and studied them instead. They looked for Unity within their extracted Pure Forms (for they believed that THERE only could be found the true Essence of the situation. And they started initially looking for identifiable sub-forms. The Truth was in their formulae!

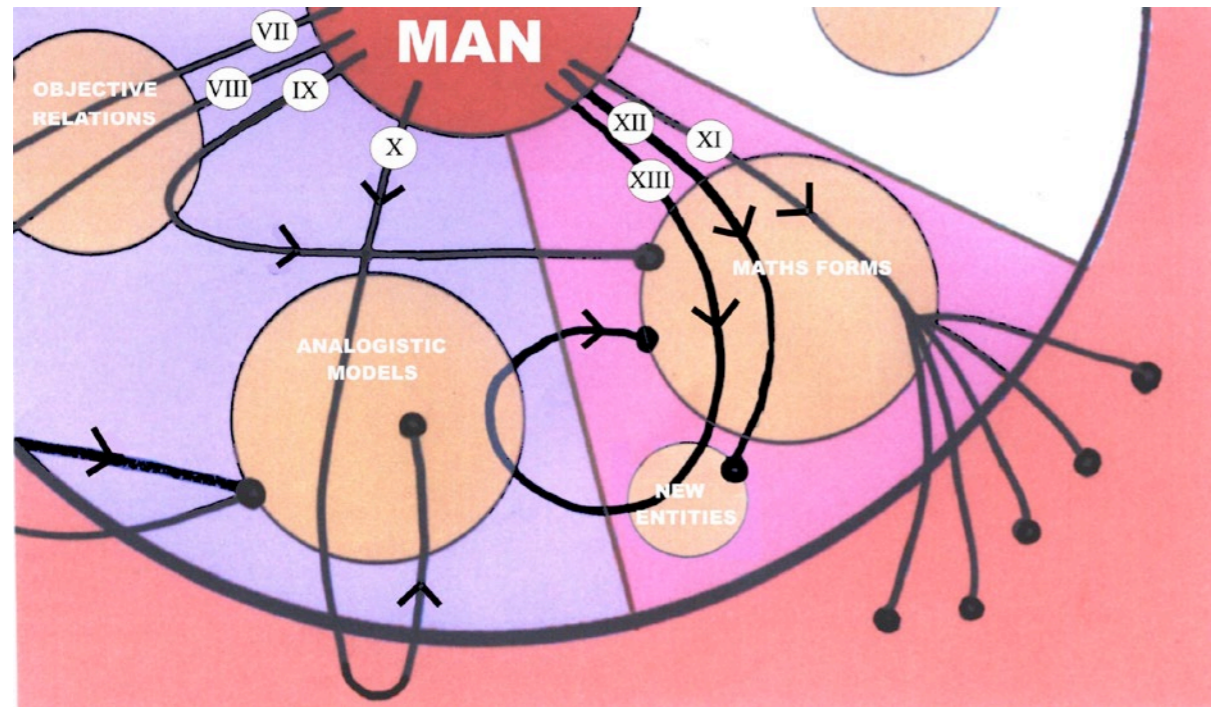
And they found such sub forms in abundance, and taking their cue from Einstein, labelled each of these as if they represented physical entities or properties. Initially, they gave them shame-faced names such as charm and strangeness, but very soon these names became “very like” the names of actual physical entities – such as , for example, particles and properties.

The scientists had learned to “mine” Ideality for new” entities and properties” – for some conceptual glue!

The new Abstraction Processes involved in this are shown in the Modified Abstraction Diagram (shown below) in the overlap between Science and Ideality regions. The essential role of Reality as the supreme arbiter in Science had been overthrown. This role was now to be taken over by Mathematics.

The maths-derived entities are correctly shown WITHIN Ideality in the modified diagram below. Where else could they be? And the pernicious amalgam of classical explanation with these new forms is shown by process XIII as below:

*Man --- Maths Forms --- New Entities --- Analogistic Models --- Maths Forms*



Now, this is ONLY a diagram!

A full analysis of what Modern Physicists have been doing does exist, but we have a more general objective here and must press on without too many detailed diversions.

To proceed, we MUST return to the basic philosophical assumptions about Reality which underlie the whole of Mankind's Thinking. We have NO choice! We must address his basic assumptions critically, and find out where he has "gone wrong"

Reality Evolves!

I have already mentioned Holism and Plurality, and the difficulties associated with this dichotomous pair, but there is an even more profound assumption (connected to these for sure, but even more far reaching).

It is connected with the question, "Is Reality the result of a summation of independent Parts – a Complexity – or does it actually EVOLVE?"

The normal answer to this question is always the former, whereas the evidence is mounting that the latter HAS to be the Truth. Reality must have a history. It must change with Time. Indeed it must evolve creating ever NEW forms and possibilities.

Now, this is not merely an assertion of belief. The evidence is all around us. We have only to LOOK!

On a hundred fronts it is clear that Reality DOES have a history of Change and Development, in which New things emerge and its very Nature changes profoundly. But as soon as we bring in Change in this way, all hell breaks loose philosophically!

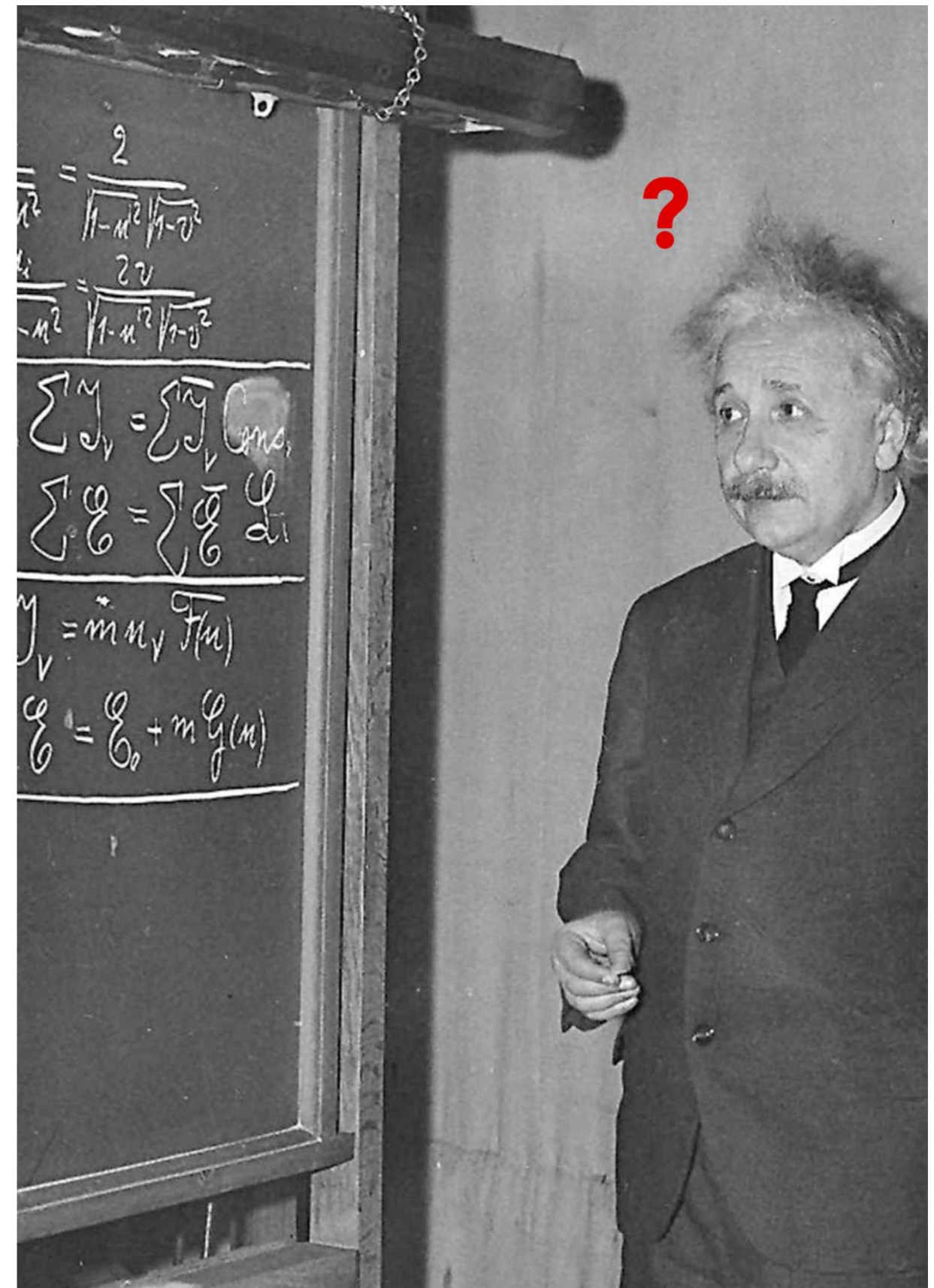
"If things change, why do they change?"

"If things change, how can we alight upon the elements of Reality in order to understand it?"

"Is Reality totally self-moving, and actually creative in itself, or merely mechanistic?"

"Can we deal with Everything in Reality with Matter & Energy alone?"

....and of course, an abundance of other similar questions.





## VIII. Revolutionary Change, Marx & Hegelian Dialectics

### A Necessary and Revolutionary Change

Most of our established methods assume immutability and seem to have served us very well. Even Formal Logic would crumble if nothing ever stays the same – it cannot deal with constant change. Systems of rationality, such as Euclidian Geometry would surely prove to be mere invention? It is clear that we are reaching the nitty-gritty in a number of separate and vital ways.

Once again, our dichotomous imperative drives us towards the precipice of contradiction. We immediately assume that Change undermines everything, and all our achievements grounded firmly on permanence will be thrown away. But as they say on the cover of the Hitch Hikers Guide to the Galaxy – *DON'T PANIC!*

We have to see Stability within Change to cope with these problems.

### Stability & Change

The reason that we succeed with our immutability assumption is that areas of Reality can be stable for long periods – indeed, Reality is actually self-regulatingly stable as its primary mode. It keeps itself stable most of the time, in spite of constant minor changes. In spite of the holistic Whole of innumerable contending factors and the bottom to top, and side to side mediations, these do NOT generally lead to total Chaos. And the reason is that there are also stabilising top to bottom mediations that constantly adjust to keep a maintainable balance. The normal situation is that destabilising factors are countered by changes by the rest of Reality, producing periods of relative stability, where assumptions of [immutability are approximately and usefully true.

BUT, all this is NOT to say that immutability is therefore the Truth. It isn't!

Behind the temporary stability, there is always an incipient instability, which DOES lead to Change of various kinds. The most conducive Changes we term

Evolutionary, while the cataclysmic changes we term Revolutions!

### Emergences!

Within the tiny DOT of our span of existence, Reality has been relatively stable, changing only in an evolutionary way, but as soon as we expand the timescale beyond this DOT, we see Reality as subject to the most drastic and far reaching revolutions, where everything can be overturned.

These are termed Emergences, and are most clearly and exhaustively categorised by a single stupendous and irrefutable example – The Origin of Life on Earth!

Do you doubt that this Revolution occurred?

The evidence is indisputable!. And as they say in Logic “There exists a.....”, which implies that others of a similar nature must also be possible, indeed likely. Now, working up a generality from a particular is not to be recommended as a reliable process, but the very existence of a particular of such vast and far reaching importance, does at least infer that it is one of many.

So though we can establish that such a category of Events does exist we cannot fully define that generality. To do that we must have available a whole range of examples, within which we are able to discern the commonalities that can be seen to DEFINE the category.

Nonetheless, the Origin of Life is pretty special. Whatever is wrong with this back-to-front method, its existence does pose a whole series of vital questions which strike at the heart of our previous (and now rapidly dissolving) assumptions. and if for nothing else the indisputable occurrence of that Event does prove the case for other such Events – for Emergences as regular, if rare, creative Revolutions.



But, as I have already intimated, such things don't happen very often, indeed NEVER within the time on earth of Mankind, so in chasing the nature of these important happenings, we have no choice but to take what is available.

### Friedrich Hegel

The really fundamental work on this area was undertaken WITHOUT full consciousness of a physical significance or even of a sociological aspect.

The crucial work was done by Hegel, when "Thinking about Thought!". He too was preoccupied, as Zeno had been, with the limitations of our universally agreed assumptions and premises, but these occurred primarily, and to his way of seeing essentially, in Human Thinking. He cringed at the absence of Change in Formal Logic, for he was perfectly well aware of the trajectory of Thought itself, which was shot through with Realisation and new conceptions. To consider Thought without addressing Change was moronic. He became intent upon the need for a Logic of Change to replace Formal Logic.

He could conceive of only one area of study to develop this new Logic, and that was obviously in dealing with the trajectories and achievements of Human Thinking, and despite, once again, it being a non-objective way to do it, he felt that he had no choice but to trace the pathways and the poetry of effective Thinking, and reveal ITS LOGIC.

His contributions (in the esoteric area of Philosophy) were a total revolution, and left a mark on Humanity still evident to the present day. He was able to show that Emergences (though he didn't call them that) were in fact legion within Thought, and he attempted to map their diverse trajectories. A whole generation of disciples (The Young Hegelians) mushroomed up around this significant work, and it was they who realised the universal nature of his "Emergences"

### Karl Marx

They, and most particularly Karl Marx, widened the subjects of study to include History, Economics, Science and Social Development – indeed, Marx had the objective of widening the sphere to include the Whole gamut of Human Endeavour and study. Indeed, he was intent upon that crucial area of Social Emergences - or

Revolutions, (and in particular the French Revolution) which he saw as evidence of Emergences occurring everywhere and at every possible Level.

But, though vast strides were made by the Marxists, it has to be remembered WHEN they did their work – in the latter half of the 19th century.

Though what was available in Science was avidly annexed to the new approach, there was still a paucity of areas for detailed studies. Just as with Hegel and Thought, so with the Marxists, the obviously available and vital area was clearly the Social Revolution. The unavoidably aberrant growth switched from Thought to Politics. Such interludes were lopsided but essential nevertheless, and they brought significant results.

### Active Philosophy - Revolution

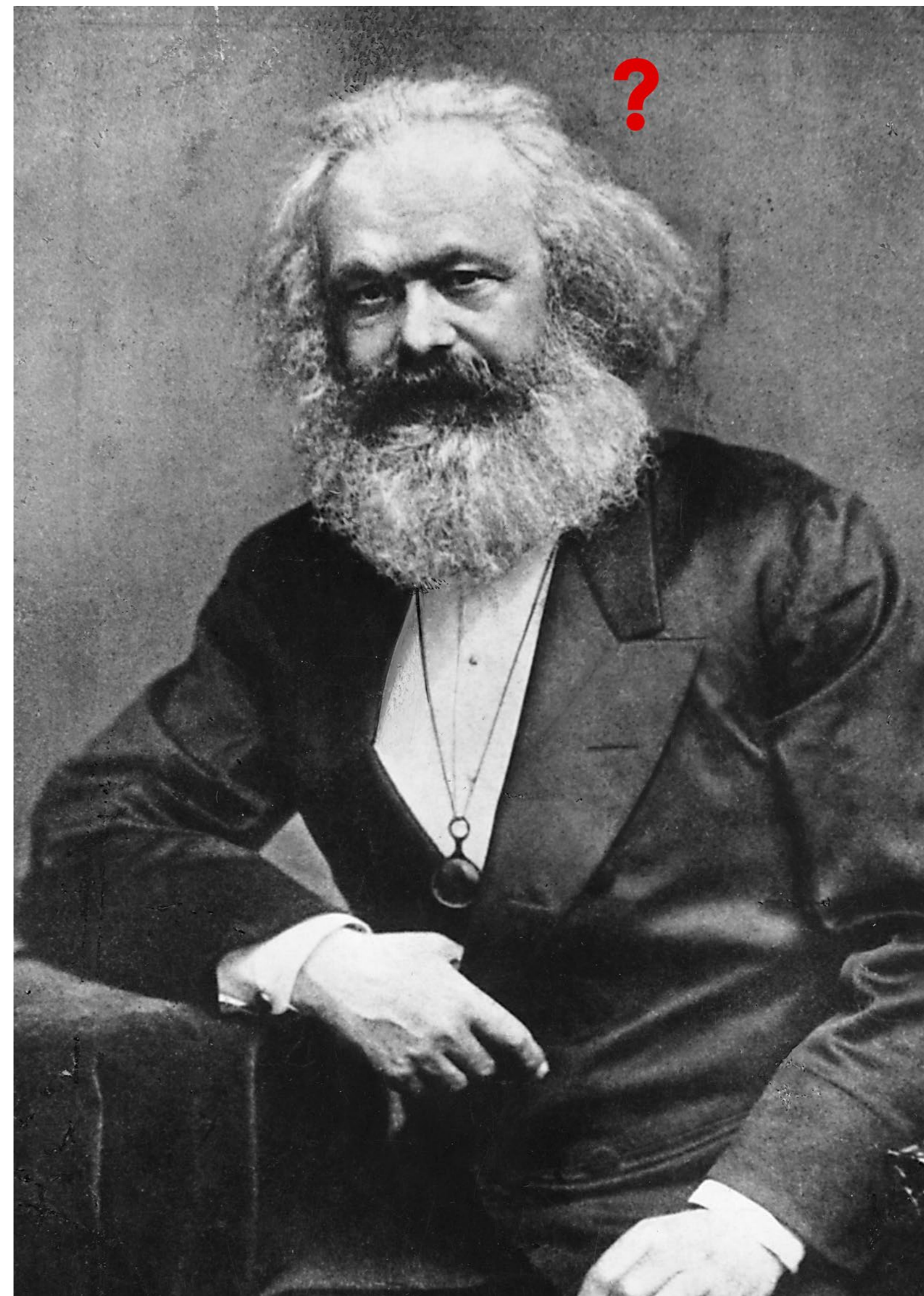
The next generation carried out the FIRST conscious Social Revolution in October 1917 in Russia.

Now, this is not a political essay, but no one can deny the vital contribution of Marxism in this essential undertaking. The path was unavoidable, yet crucial, so there need to be no apologies for what was achieved. For, it was, as usual the problem of pulling ourselves up by our own bootlaces.

### Undelivered Application

The general study of Emergences was NOT undertaken. By this I mean the must-have-occurred Emergences in the development of Reality as a whole, which includes the Emergence of the Origin of Life on Earth, and the obviously following cascade of Emergences involved in the subsequent Evolution of Life itself.

In spite of the importance of such Events throughout the full history of Reality, this approach was neglected and indeed "elbowed out" by the well established methodologies of Science and Formal argument. The consensus attitude omitted addressing Emergences at all! Indeed, they were dismissed as self-kid! A mechanistic alternative ruled the roost, and because of the evident inadequacies of such an approach, substituted a pragmatic patchwork of separate Domains, for any attempt at a coherent, comprehensive and integrated Emergentist perspective. And it still pertains to this day.





## IX. Outstanding Tasks, The Holist Stance

### The Crucial Outstanding Tasks for Marxist Theorists

The very unavoidability of the Origin of Life on Earth could NOT be tidied away. It demanded explanation, and slowly but surely using Life as a template method, initial definitions of Emergences as radically transforming Natural Events began to be formulated.

Surprisingly, these were NOT lead by the Marxists. Instead, individuals and small groups of scientists began to formulate these generally.

### Many Wrong Turnings

Various diverse groups embraced the area of study “from their own discipline standpoints”. Green campaigners were enamoured of the approach, but did little to develop it scientifically (Lovelock comes to mind). The Nobel Prize-winning physicist Laughlin in opposition to the consensus in Moder Physics also lined up on the side of Emergences. Emmeche from the Niels Bohr Institute in Copenhagen published a joint paper with two colleagues from other areas of study espousing the Emergentist approach, and finally Murray Gell-Mann and colleagues at the Santa Fe Institute in America also insisted that they were “of the same persuasion”. But though I suppose that these were a significant and diverse group of supporters of the idea of Emergence, I’m afraid that they did not turn any significant corners. They were, of course, ill equipped to address the real problems and tasks involved, for these were unavoidably philosophical. In addition it turns out to be impossible for anyone to make contributions in this field who are still following the standard pluralist approach of the majority of scientists. It is clear to me that such researches, no matter how dedicated, cannot overcome the problems inherent in the pluralist approach. After all, the most essential feature of Emergences MUST be that they are creative! In the same way that Evolution was incessantly punctuated by the entirely New, and involved a regular opening up of new Potential and Form, so it was with all Emergences. The creative aspect of these Events was anathema to most thinkers.

The iron grip of strict Determinism on the one hand, and still-existing religion on the other, were sure they had ALL the answers already. They had always had the answers, of course!

To depart from strict Determinism was condemned as Metaphysics on the left hand side, and Sacrilege on the right.

The epitome of the Scientific approach was embodied in the work of Holland (at Santa Fe), who along with ALL his colleagues it seems, was convinced that he could “demonstrate” Emergences via Computer Simulations.

Forgive me while I fall about laughing uncontrollably. The idea that a retrospective form such as a computer simulation could possibly produce *creative* Emergences was unbelievable. But, remarkably, that turned out to be the Determinist/Reductionist consensus. Quite clearly such people could never tackle the problem: the Emergence of Life on Earth could never be addressed merely by a re-mix approach.. All they would be able to do is emasculate it! They might be able to turn it into a vehicle for their careers, but they could never address its true essence.

### So, Who Could Tackle This Problem?

It should be obvious WHO should be doing this work. IT IS YOU!

Indeed, as far as I can see ONLY dialectical materialists could ever address the questions posed in this area. With a multi-discipline approach, and taking in ALL the developments since the time of the great Marxists, we should attempt a Marxist description of Emergent Events, and to do this believeably, we must first tackle, then reveal, and finally destroy the prevailing scientific consensus methodology based on Plurality. We must bring about the demise of Reductionist Determinism as the main barrier to progress in this crucial area ( as well as many others)

The undertaking is about Epistemology – the task of understanding and explaining Reality, and about Method – the means by which we do this. The established methodology CANNOT address what we must deal with here, so we must first criticize fully, and then replace, the old methods. We must see the flaws in the old reductionist/Determinist methods and define the necessary alternatives. Not Plurality, But a New Holistic Science.

Now, earlier in this paper, I already intimated that Plurality is not only a purely pragmatic approach to the study of Reality, but also, and unavoidably, imposes the consequent conceptions of Determinism and Reductionism upon how we see things as a whole. These ideas “unify” our global conceptions into what seems like a coherent and comprehensive Whole. But, it is merely a useful myth.

Its opposite, Holism, fared even worse, for though seemingly more all-embracing, still delivered NO effective methodology with which to deal with Reality, and, in any sort of scientific way, reveal its inner workings. So, we are presented with this pair of alternatives, neither of which is adequate to the required task. Therefore, though it seems incomprehensible, our task is defined as having to work through this dichotomous pair to another, different approach, which really does reflect the real situation.

We must explain in detail how these alternatives have in the past only led us astray, and following this attempt a synthesis which transcends their evident contradiction.

No easy task!

First, we must reveal the unavoidable dead-ends involved in a purely pluralistic methodology, and then without clanging over to the opposite extreme of ineffective Holism, point the way instead to a superior methodology. Of course, such a task is a supreme undertaking, and of course, way too big for a single paper, or even for a single contributor. But a start must be made, for only by such actions will other additional forces be recruited to this fundamental task.

### What is Wrong with Pluralist Technology?

Let us first establish irrefutably the limitations of the now universally established Pluralistic Method. By the processes of isolation, extraction and abstraction we separate embedded relations from their Real World context, control or ignore formative, as well as seemingly trivial, simultaneous factors, and then limit the ground for their intended use, so that they do indeed deliver what is required when used there.

We construct stepping-stones across the veritable river of changing Reality, without tackling the torrent as such. Of course - we are aware that each and every extraction is limited to its own Domain of Applicability – our secure stepping stones, and that if their limits are transgressed, our formulae fail, and we step into the midst of the torrent, and are swept away to oblivion. (For once beyond these limits the formulae are totally useless and give false values for all crucial variables). Indeed, the experienced user of these methods knows, that to ensure any progress, we must abandon our last stepping stone for another in the next Domain.

Our feeble attempts at transcending these boundaries automatically are similar to constructing makeshift bridges from one stepping stone to the next. Such “bridges” can only be retrospective, as each and every stepping stone has to be separately investigated to produce its pluralistic formulae. Only then can these purely artificial bridges be constructed.

The method is what I call “Additive Complexity”, where the various Domains and their formulae, become different “terms” within a cover-all single equation. The terms are integrated in such a way that as we move from one domain to the next, the old term vanishes, while the appropriate new one comes into dominance. It is a clever (and once again pragmatic) trick. But it delivers NO explanation of the transition at all. It is a purely retrospective frig, to deliver a practical, mindless solution..

Though, highly popular amongst engineers, these frigs tell us nothing about what is actually happening, and why. They could not by any stretch of the imagination be called Science. They are mere Technology!





It HAS to be asked, “What is really happening as we move across such boundaries?”

It is abundantly clear that our pluralistic methods cannot address this question, because the answer *MUST* be contained within the *VERY FACTORS* that we have either “nailed to the floor” or totally ignored. Clearly, our selection of what was vital, ceases to be true. Our banker, dominant factors will melt away and themselves become negligible, to be replaced by others from those we cast away. Indeed, the very factors necessary to deliver the changes are unavailable, as our pluralistic methods disposed of them as irrelevant.

## X. Emergences, Breaking from Old Ideas, Tackling the Problems

### Emergence is Key

Now, we must not get embroiled in the many possible diversions which can be brought to notice at this point. This is NOT a similar “ignoring” as was essential in the pluralistic methods, but a refusal to be scuppered by irresponsible “Yes, buts...” A coherent contribution is always welcomed, but the throwing of rocks without evidence must ALWAYS be excluded. [I have dealt elsewhere with Changes of State (Phase Change), such as in the transitions from solid to liquid, and liquid to gas, but these are accommodated elsewhere, and would only (and perhaps purposely) confuse this current and important narrative, with which we are primarily concerned here.

In addition, I must admit that I am laying the essential groundwork for that most important radical Change in the history of Reality, which is termed an Emergence. For where these arise may be seen as somewhat similar to those of Changes of State, but they are NOT identical. Though when attempting to explain Domains of Applicability this is still a fair approach, though applied in a much more limited area. The differences are to do with repeat-ability, and reverse-ability. While Changes of State and “Domain hopping” are reversible, Emergences are NOT.

An Emergence is NO local change of phase. It could, I believe, be considered as a “System-wide Revolution”.

Instead of a local, formal or organisational-only change, we are here addressing a major flip, which would take the form of a whole series of veritable avalanches, finally precipitating a Whole New Level. And such a Level – the Emergence – would be not only organisational, but also creative and indeed revolutionary.

Now, if such a description seems mystical or airy-fairy, you MUST be directed to consider the first, and totally unique Origin of Life on Earth. That was no mere Change of State, was it?

Did it happen? Indeed it did! And what did it achieve? It created wholly new Forms – billions of living things – which were both self-maintaining and self-perpetuating, and which transformed everything on Earth.

They transformed their own environment, such that the very rocks beneath our feet are the remains of living things (when limestone), or even the products of living things when they are oxidised minerals, as the necessary free atmospheric Oxygen was only possible with the constant action of Plants during Photosynthesis.

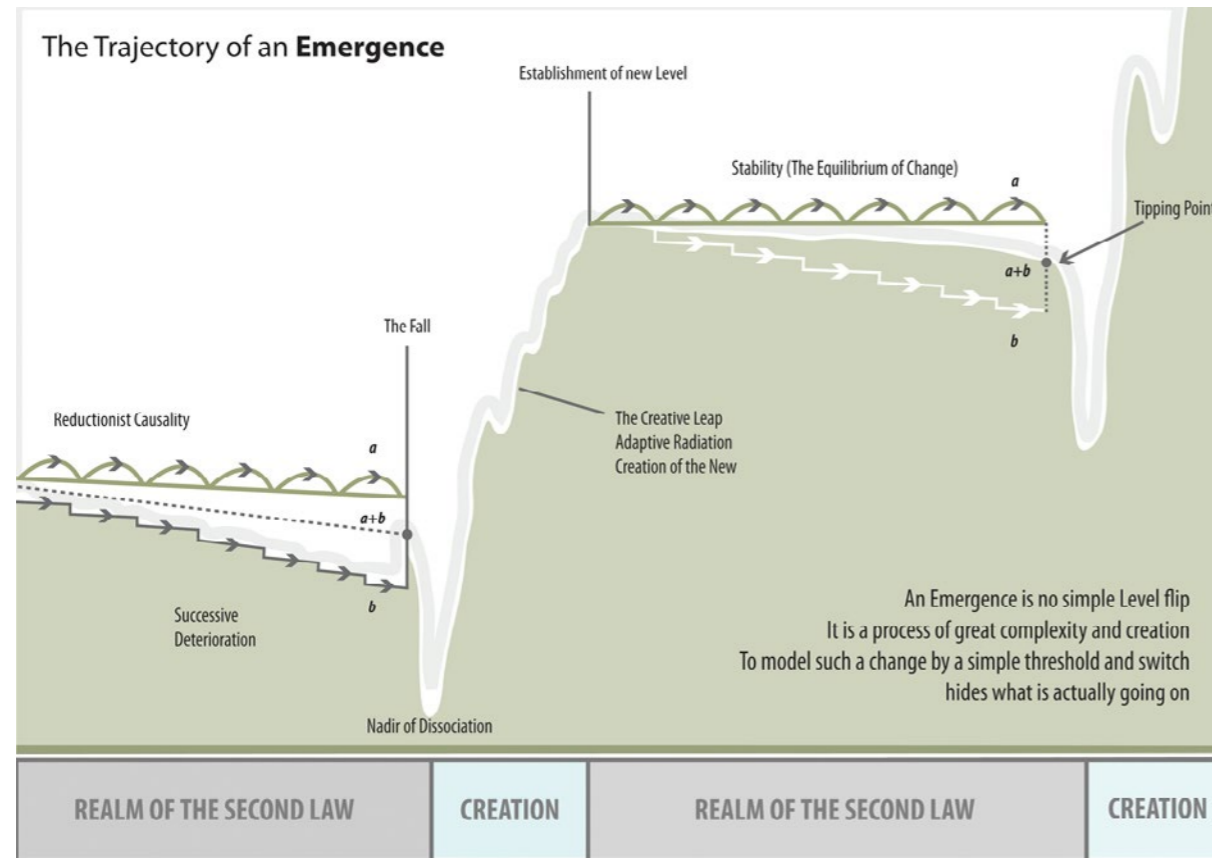
An Emergence then is most certainly a Revolution. It couldn't possibly be described as anything else.

And it also has a more profound element – that can only be called Overall Stability. From one universal environment with its own form of this stability, an Emergence precipitates an entirely NEW environment, with a different but similar stability. So different, indeed, that the new form is packed full of new, never-been-in-existence-before entities, properties and even laws. Indeed, within the New Level, the old prior Level situation has ceased to exist, and has been replaced by something entirely New.

It is HERE, at this remarkable transition, that the old pluralistic methods fail absolutely, and can provide NO explanations at all for what has appeared and taken over. The old Level dominant relations have gone, and new dominances have arisen. Even the old variables have vanished into that same obscurity as that to which we relegated our old unobservables and negligibles of our prior Level Science.

Indeed, this process, along with the creations of entirely new variables and relations, prohibit the extrapolation of the old precursor Level laws into the new Level. You cannot predict the New Level from the Old due entirely to our methods of analysis, which though practical “within Level”, deliver nothing when Levels change.





### The Consequences of Emergences

Thus, we cannot use our old pluralistic methods to explain the Origin of Life, because they do NOT contain the essential factors that are involved in the transition. We had thrown them away! But even more amazingly, the very Stability of the new Level militates against our wholesale condemnation of those methods. Why is this?

It is because it re-enables their use “from scratch” at the New Level. The same pluralistic compromises will AGAIN be possible to allow its entities, properties and laws to be isolated, extracted and abstracted in exactly the same way and with the same pragmatic usefulness, BUT FOR A DIFFERENT WORLD, and hence producing a whole new set of things at the New Level.

AND, it must be stressed, that this resurrection of Plurality infers NO CONTINUITY across the transition. The system simply DROPPED OUT during transition, but could be effective again within the new Stability, at the New Level.

Yet that Assumption of Continuity is precisely what the vast majority of our researchers assume. They DO expect to be able to explain the Origin of Life from prior non-living processes using the old pluralistic methods.

It is in our *Thinking* that we are Stymied!

Now, once again, I must stress the difference between Being and Epistemology! The above assertions do not mean, “Give up now you’ll never do it!” Not at all!

There is NO doubt that there is a “continuity of cause” between the pre-Life Level and that of Living Things – just as there MUST be between precursor and consequent Levels in every single Emergence. That is indisputable! But what we are revealing here is that such a Continuity is impossible to reveal using our universally accepted pluralistic methods.

It is WE who “wall off” the possibility of our understanding, because of our current inadequate

methodology. Being is undoubtedly coherent, but our methods of dealing with it are not!

The impasse (as always) is one self made by Mankind. We always construct the barriers to our own understanding, by the very methods that we invent to reveal Reality, for in finding ways to bring fragments of Reality into our sphere of affecting it, we simultaneously prohibit the revelation of how Reality itself continually recreates itself in innumerable new Levels of existence.

Our tackling of Reality cannot be direct and obvious, but ONLY consistent with where we are at any particular point in the process. We can NEVER jump out of our situation. Our methods can initially ONLY arise out of what we already know.

But we are Thinking creatures, and we do make breakthroughs, and indeed progress!

It is just that such particular required break-throughs are truly MONUMENTAL! To achieve it we have to transcend our previous methodology! AND IT HAS BEEN DONE ALREADY!

A Successfully transcended Emergence: but what have we learned? Momentary and significant transcendences of the sort necessary here HAVE been achieved, and then LOST!

What do you think Lenin did in 1917?

So, let us recap how far we have got in the re-vitalisation of Marxist Theory.

We have deduced that the usual pluralistic methodology of theory development over the whole range of Human endeavour, including Science, is incapable of dealing with the real drivers of Change in Reality, and crucially in its most significant and creative mode – that of an Emergence.

We have, I believe, already demolished that methodology outside of within-Level Stability. That old methodology has fragmented our Understanding into quite separate Level-defined Sciences, and has directed all our gains towards technological Control and Production.

Though attempts to understand still exist, they are also largely emasculated by the universal acceptance of the

same pluralistic methods. The best of our scientists have realised the problem, and have taken on the task of opposing the worst excesses of pluralistic Science – as in Quantum Theory & Cosmology for example – BUT they are clearly inadequately equipped to succeed. They have neither understood nor rejected the established methodology, but ONLY its results.

Their standpoints are modern, secular versions of the God-of-the-Gaps “hope”, in that they know what fragments have been achieved by their pluralistic methods, but they merely “expect” that they will be unified in the future by new discoveries – found by the same, old methods, that will “bridge the gaps”

So, How do we Proceed?

I believe that by now it must be clear to the reader that this is a forlorn hope. The waited for “bridging discoveries” are indeed unobtainable by those methods,

What has to be done is to complete the task, and that is no mere “add-on” to old work!

It involves the thorough demolition of the old methods, and a root-and-branch overhaul of our methodology to devise a NEW appropriate set of techniques equipped to deal with all Emergent Change.

For someone who has been attempting to be a real Marxist for 50 years, such assertions seem unnecessary, but the reverse is true. I have never come across an analysis of pluralistic assumptions and methods by any Marxist in this very long period. The self-professed Marxists themselves subscribe to these alien methods as if they have no choice in the matter. They embrace the same methodology as their avowed enemies, and true philosophical Marxism dissolves away to be replaced by a sort of moral socialism without real Philosophy or Theory.

Marx himself in his *Poverty of Philosophy*, and many other works, condemned Socialists such as Proudhon and his like for their Utopian Socialism, and their totally inadequate philosophical methods. He (like me) arrived at Socialism via Philosophy, but he was aware that Mankind’s knowledge and methodology was “drenched-through” with a totally inadequate approach. He spent whole decades combating such things. But, in spite of their crucial role in the development of his overall

Philosophy and Programme for action, we miss all this out to concentrate on his political commitments.

We copy his activism, while ignoring his fundamental philosophical work.

And, sin of all sins, we look to him for ALL the answers. That MUST be the most damning error of all! Highpoint though Marx was in mankind's development, he was no God. He didn't have prescience to accurately predict the future and direct our work for the coming centuries.

That MUST be our job!

But, that Task has already been commenced. My efforts, particularly in the last couple of years, have, I believe, begun to indicate what has yet to be done to move forward. The most thrilling and demanding task must be in carrying through Hegel's objective of a Science of Logic – a Logic of Change, and the subsequent orchestration of all the gains of Mankind since the second flowering with Lenin & the Bolsheviks in 1917 into a coherent Whole, PLUS the central crux that is the trajectory of an Emergence. (see The Theory of Emergences in SHAPE Journal)

How does Reality raise its game, and rush to a new creative Level?

Can we tackle "bridging the Gaps" ?





## XI. Universally Applicable Theory, Science, Explanation Above All

### Current Theoretical Work

Now, in case my readers think that this is all hot air, may I finish this paper with my current theoretical preoccupations?

### The Crisis in Physics

Since my intellectual birth in my late teens at Leeds University, I have struggled unsuccessfully with the idiocy of the reactionary "revolution" in Sub Atomic Physics. A Reaction that was exactly simultaneous with the rise of Fascism in the World.

I have, in the past, laboured long and unsuccessfully in attempting to correct this massive retrenchment, but have for most of the time been totally unaware of the cause of that retreat, and have largely and unconsciously limited myself to their pluralistic methods to combat these "errors". Needless to say, I did not succeed. Indeed, it was ONLY when I "tracked back" to philosophical fundamentals, that I began to get anywhere. And the touchstone for me was Zeno's Paradoxes and the realisation of how significant were our assumptions and premises in erecting explanatory systems.

NOTE: In case my readers think that this was a fairly obvious step, let me vigorously dissuade them. Having read many contributions to the assessment of Zeno's efforts, I have to say that what he did is almost never understood. The commonest content in articles about these Paradoxes are of the type "Where Zeno went wrong!". The usual conception of what Zeno was doing was that he was a "spoiler" cleverly undermining the sound basis of Mankind's achievements with his cleverly constructed contradictions. But, of course, Zeno's purpose was no such thing. He wanted to draw attention to our unquestioned assumptions, and to show where they led "in extremis". In missing the point in this way, NONE of them came anywhere near an understanding of the limitations of their own implicit methods. Zeno was, and still is, totally ignored to this day.

My researches kept being driven "ever backwards" to such fundamental elements, and my research into The Processes and Productions of Abstraction began to reveal the nature of man-made Explanation, and the incredible erection of the World of Pure Form alone – Ideality, which has turned out to be for many the actual objective of scientific research.

### Double Slit Experiment

At a certain point I began to feel that tackling the Old Enemy might well be within my grasp, and a return to Zeno led me to realise the vital role of plurality in Mankind's attempts to understand Reality. In the last period, I have focussed my efforts on the crucial Experiment of Modern Sub Atomic Physics called the Double Slit Experiment.. I commenced to bring all I had learned to bear on this "foundation stone" of the "New Physics". I decided on TWO separate and unconnected assaults on this troublesome peak!

### Back to Explanation

The first would attempt to explain this phenomenon by purely classical methods. I have always found the pinnacle of Science to be that version pursued in the Victorian Era (My personal Hero being Herman Helmholtz). And, have long been against throwing out the baby with the dirty bathwater. It should NOT have been Victorian Science's explanatory tradition that was dumped, by Modern Physics, but merely the errors of the past. In other words we should have treated the situation we encountered in the sub Atomic area of study in the same "explanatory" way as previously. So this exercise would be an interesting one.

The second approach would vigorously expose the theoretical assumptions, and all subsequent stages in the erection of the final wholly unprecedented Theory. This would be based on my extensive researches as referred to above, but would be more particular, and address the various steps one at a time to reveal the basis for every one.



Both these lines of research have been successful! I have not dotted all the “i”s, and crossed all the “t”s as yet, but full solutions are clearly possible.

As far as I can tell by studying the academic literature, mine is the ONLY Marxist attack on the problem. Nobel Laureate Laughlin, Emmeche of the Niels Bohr Institute in Copenhagen and Holland – the leading researcher into this area at the Sante Fe Institute all take an Emergentist standpoint, but none of them are Dialectical Materialists, neither have they understood the bases of this modern reaction, or that these same things are still unchanged in their OWN methodology.

Their chances of success must be as minimal as those who have attempted to explain Life in terms of non-living processes. In spite of their commendable attempts, they seem to me to be doomed to failure.

Let me briefly outline my dual undertakings in this area. The Key Experiment for the New Physics: The Double Slit Experiment (originally called Young’s Slits) has two versions. The first uses Light shone through a pair of closely positioned slits in an opaque plate. The separation of these slits is close enough to to produce an interference pattern of fringes on a receiving screen beyond the slits. This is easily classically explained by treating the Light as a Wave Motion.

The second version of this experiment uses not light, but a stream of electrons, and surprisingly the receiving screen again displayed the same sort of interference pattern as with Light. All hell broke loose!

#### The Copenhagen Explanation

With Light simply replaced by electrons, the immediate, and simplistic reaction, was to say that electrons must be wave-like in nature. If the stream of electrons was like a wave, then the experimental set up would indeed do exactly the same things. But, of course, this is a very unscientific conclusion. The same results CAN be produced by very different phenomena. That is the basic fact behind mathematics. We don’t assume that all phenomena utilising the same mathematics MUST be produced by the same physical reasons. And such a slight conclusion was also not appropriate here too. So how can particulate electrons interfere? They can’t of course! They could, if they were waves, but they are not. The arrivals at the detection screen were definitely of individual and decidedly “local” particles.

These arrivals occurred one at a time, but built up to finally deliver the same sort of pattern as would be produced by waves. Our physicists were perplexed! How could they explain this confusing Experiment?

They did it by abandoning all classical explanation. They were impatient with “theory”! Many of their number had already found the mathematics to deliver exactly what occurred. Why bother with Theory at all? They therefore proposed a non-existent “wave” associated with the electrons as a whole. No such wave was detectable, but that didn’t matter. These revolutionaries were departing from “old Science” into a wholly new approach. The “waves” were not physically present at all, BUT delivered the probabilities as to where the individual electrons would end up. It was the epitome of a purely maths-driven Science.

#### A Fulfilled Objective

They had found a Pure Form in mathematics that could be easily shoe-horned to deliver the “right numbers” to account for the final cumulative pattern. And, “If it works, it is right!”, took over. NO explanation was proffered for this, just the fact that it fitted perfectly. Indeed, these physicists stressed that no explanations should ever be attempted. For scientists were condemned for ever even trying to explain. The New Physics had been born.

Now, after centuries of explanation most scientists worldwide were quite unwilling to abandon what had been achieved over the most significant period in the History of Mankind. But the new physicists were adamant. Explanation must go! Mathematics was the Truth of all things, and the “old fashioned scientific process” HAD to be truncated as soon as a mathematical form could be fitted to the experimental data. The usually following “explanation phase” had to be dumped!

## XII. The Fight Back, a Physical Ground

Now, such a reactionary step had to be defeated. Scientists had been aware of a tendency to do this across the board in Science, but these “brilliant” Nuclear Physicists now had come up with a reason.

Now, my first effort was to suggest a classical explanation “in the old style”. Various steps were taken to construct a viable explanation from a definition of the nature of the electron stream, as being solely determined by its Source, via a Diffraction of the electrons at both slits, giving a fan-out of velocities, with the fastest going straight through, and the slowest being inversely proportionately deflected.

So far so good, but if nothing else was involved these fan-out could NOT produce an interference pattern at the detection screen.

#### What was Missing?

There had to be something BETWEEN the slits and the screen which could deflect electrons, and this “field” would have to be very similar to an interference pattern. What could it be? Nothing had been detected!

But, something MUST be present in that space. It can only be caused by either the “slits” or the moving electron streams” or BOTH, but it does not have to be extensive. If it were initially strong but dropping off very quickly, that would still be sufficient to do the job. Two interfering components (one from each slit) would be involved, and as the effect is known to vanish as the slits are moved apart, it is clear that the mutual effects must at least be the distance apart of the slits in extent. Obviously, the problem that caused such a solution to be immediately discounted was the fact that interference can ONLY be caused by contributing elements that include both positive and negative (i.e. oscillating) parts, so that they can either re-inforce or cancel-out.

Now that sounds like wave motions, but such DO NOT terminate over very short ranges. They impart a momentary disturbance and then move on. But such have certainly NOT been detected over many years of trying and by innumerable researchers.

Do the Phenomena Demand a Substrate?

So we are talking about something NEW!

Let us put aside exactly what it might be for the moment, and instead work out what our required “field” would have to do.

Imagine that TWO components, one from each slit, come together very close to the pair and interfere in a fan out from the slits. The shape would be radial, and would be composed of alternate reinforced effects and cancelled effects.

The electrons, as we have already established classically, would also produce fan outs due to diffraction by the slits. Imagine the superimposition of these.

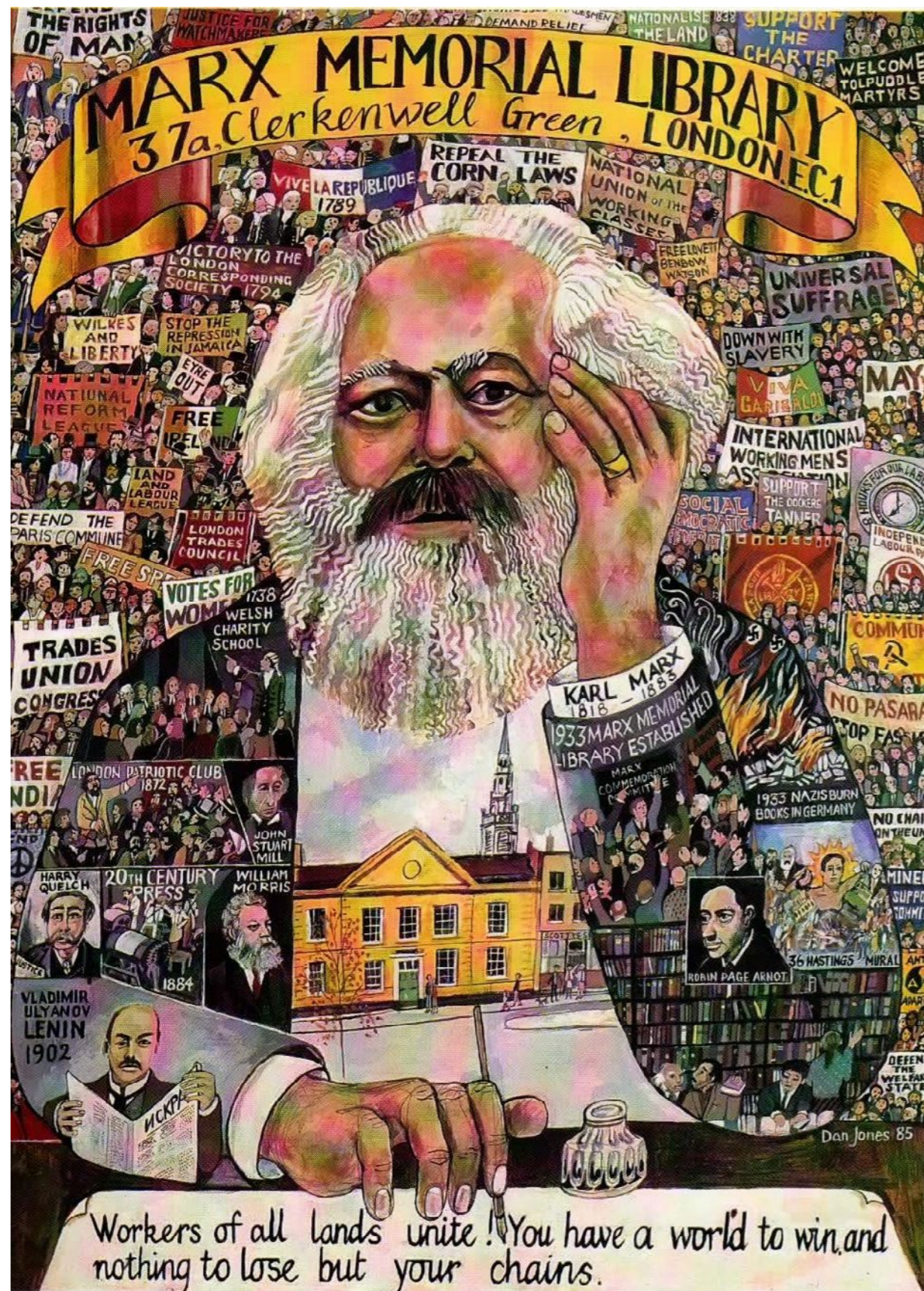
The reinforced fringe regions would deflect the –ve charged electrons, while the cancelled regions would allow the electrons to go straight through. When you work it out, you arrive at “gaps” where the electrons were not deflected, and “field” areas where they were. All electrons would end up in the target regions determined by NO FIELD at the slits., while those determined by ACTUAL FIELDS would deliver NONE.

The result at the detection screen would be the observed fringes.

But, What is it?

Now, of course, there is still a question mark about our postulated post-slit field. But the electrons ARE –ve charged, and are known to produce magnetic fields when in motion, while the proximity of charges are also known to produce induced charges in appropriate materials nearby. We are not exactly whistling in the breeze with these surmises are we?

And, of course, this does produce an Explanation. In this effort the electrons are NOT obeying a disembodied “Probability Wave”, but are generated the fringe effects by physical causative factors.



A MARXIST REVOLUTION IS NEEDED IN SCIENCE AND HOW WE THINK ABOUT REALITY GENERALLY

Remember, scientists throughout the centuries were willing to state such evidence as physically caused, long before they had full and accurate explanations as to the causes. THEY could have taken the route of the New Physicists, but they never did. Were they right?

I would have thought that this particular version could be confirmed or denied by appropriate experiments.

#### New Ideas and Methods

BUT, my second alternative approach is NOT irrevocably based on this attempted explanation. I have also attempted a very different route, via my criticisms of the usual scientific methodology.

Indeed, if anything, the following attempt is much more sound, and also delivers the necessary rebuttal to our reactionary scientists and it is not as alarming as it sounds.

It does not throw away the gains of that well established method of Experiment & Explanation (or even the truncated version stopping at the derivation of an equation). What this alternative explanation does is to explain the observed phenomenon via an Emergence-like transition.

The FLAW in their attempted version is the suppression of both the containing Context on the one hand, and the treatment of the negligible factors on the other. These are unavoidable in the usual scientific methodology, and delivers results, while-ever the situation remains, within a stable Context (or Level) and whether by Nature or arranged by us. In addition, having removed, or totally constrained, all systematic minor contributions, we treat both the bundle of negligible minor perturbations and any unknown (because invisible) remaining contributions as mutually contending, and this allows us to remove their effects by merely averaging our results. We can do this because these tend to cancel each other out. But, such averaging is "over time", and moment by moment, these are evident as seemingly tiny, random perturbations. So we have these Random perturbations which as well as being very small, cancel each other out over time, and our averaging delivers a good sound result (accompanied by a small random error).

Now, elsewhere I have demonstrated that at an emergent boundary of any sort (whether minor as in Changes of State, or major as in a full blown Emergence), what were dominant factors and subject to normal scientific study

begin to SUBSIDE, and the minor perturbations GROW in significance until they usurp the situation entirely.

What were tiny zigzags of perturbation, become MAJOR ZIGZAGS which totally swamp the situation. BUT, they can STILL be predicted by averages, as they were selected as such by our methods. Thus situations can occur where by seemingly inexplicable individual events can be summed to produce predictable results.

That is what happens in the famed Double Slit Experiment. Because we NEVER did know anything about the mutually contending perturbations, they when magnified they are totally inexplicable.

The crucial point here is how criticism of method traced through from Zeno to Modern Physics reveals the reasons for their failures in this and other crucial areas.

#### Postscript

This now complete, 12 part series was meant as an introduction to the current Marxist Work delivered by the SHAPE organisation. Current research and findings are at the forefront of such work, and the very latest is available on-line in the SHAPE Journal, Blog and Youtube Channel. It had become clear that a more basic outline of Marxism was necessary, and the above series was taken from our work 10 years ago as a suitable introduction. So, whether it has triggered an abiding interest, or an avalanche of criticisms, we can offer a substantial range of the very latest developments .



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