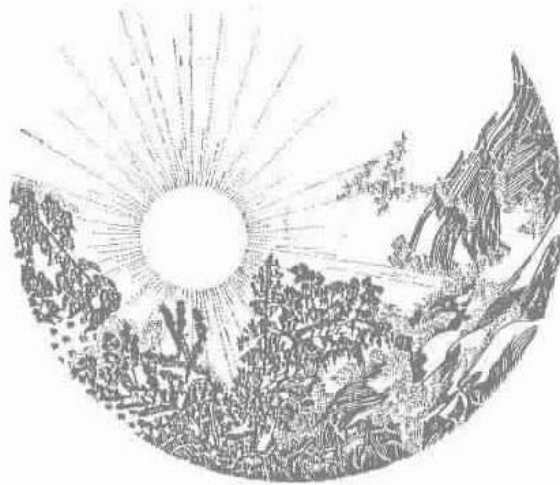


De Labore Solis
Airy's Failure Reconsidered



Walter van der Kamp

De Labore Solis

Airy's Failure Reconsidered

*"The whole history of science
shows that each generation
finds the universe to be
stranger than the preceding
generation ever conceived
it to be."*

- Fred Hoyle

*"There will be a revival of
Christianity when it becomes
impossible to write a popular
manual of science without
referring to the incarnation
of the Word."*

- Owen Barfield(1)

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Abstract

When a scientific theory "saves the appearances" of certain phenomena with which it is concerned, there is no guarantee that such a theory has hit upon their true explanation, a proviso, incidentally, that holds for all philosophical systems and religious dogmas. Certainly the history of science bears out this limitation with its tale of many theories held as gospel truth once upon a time, but sooner or later disposed of by the impact of newly discovered data.

That appraisal certainly stands for astronomy, the queen of the natural sciences. From Antiquity until 1543 Ptolemy "fitted the facts"; then from about the first half of the seventeenth century until 1919 Copernicus ruled supreme, though never experimentally verified, let alone irrefutably proven. From that year on, aided by the relativistic mindset of the age, Einstein has been in the ascendant, and the tenets of modern astrophysical theories have become so tainted with anomalies that they defy the mind which tries to evaluate them.

The present essay focuses on a few aspects of the Special Theory of Relativity that are seldom sufficiently realized. To be sure, if Einstein is right, neither the orbital, nor any other velocity of our Earth can be measured directly. And indeed, no one has ever experimentally demonstrated that the Earth circles the star called Sun. Hence one might well conclude that in fact Einstein is right.

That is, alas, an overhasty inference, resting, as it does, on an unwarranted generalization. Upon close, logical inspection the Special Theory of Relativity turns out to be no more than a lopsidedly supported

hypothesis. For if in the Sahara no icefields can be found, this observation does not thereby prove that icefields exist nowhere. If here on Earth the velocity of light is the same for all observers, then that fact does not yet thereby confirm that this "apparent paradox", as the Ridpath Encyclopedia of Astronomy and Space calls it, is equally valid for observers on the moon, which is in motion relative to us. At least one control experiment is necessary to make the paradox credible, and two simple tests for just that purpose are readily available. Both have already been performed, the one by Hoek in 1868, the other by the author and his co-workers in 1982. Their outcome in a laboratory at rest on the earth indeed supports Poincaré's "principle of relativity" squarely. This result, however, does not deliver proof, logically. Only after the same experiment has been executed in *e.g.* a Concorde or Space shuttle, and its results still uphold Poincaré's principle, will Einstein's Relativity have become a viable theory.

Yet even after such a verification it will still suffer from two incurable weaknesses. In the first place its two axioms cannot be observed except through the very phenomenon they are invented to explain, i.e. a non-apprehensible Maxwellian demon manipulates the measured data. What is worse, no one has ever proven the Earth to be in motion, and hence there remains the possibility that this phenomenon of our moving through space, which Einstein considers "already proven", after all does not even exist. Furthermore there are several theories, disregarded but extant, which address themselves to the enigma of Earth's seeming immobility. They exhibit the same shortcoming as Einstein's reworking of Mach's principle, but are logically less

jarring and frustrating. One may, for instance, go back beyond Mach to Leibniz, who appears to be the first one to have argued a "no matter, then no space". And then one may opt for Wilfred Krause's "Eigenspace" monadology, a proposal dialectically at least as acceptable.

In this paper the author goes back even further. Under the aegis of the prevalent astrophysical paradigm, the pre-Copernican geocentric view is after all "as good as anyone else's, but no better", or, as a prominent astronomer privately expressed it, "scientifically undisprovable, but philosophically acceptable".

This paper argues, however, that the long discarded Tychonian theory is in fact better on all counts. It is free of the defects that inhibit all the efforts to replace it, because it is founded on the logically impeccable *modus tollendo tollens*. In other words, this "unthinkable" cosmic model will be verified or disproven by the same experiments to test special relativity discussed above. "If P, then Q", but "If no Q, then no P". In the event that the speed of light measured from a fast moving platform turns out to be Einstein's earthly absolute " c ", he stands vindicated. But if a change of c is observed, equal to the speed of that platform measured relative to the Earth, then he will be discredited. Or geometrically formulated, if that change in c is observed, then the Earth is at rest, and it is the standard of rest for the light in the spatiality around us, whatever that spatiality's properties and extension may be.

The consequences of such an unexpected corollary, which "saves the appearances" in the simplest way possible, are drawn and analyzed. Reasons are given for the fact that in all likelihood testing Einstein from a moving platform will be deemed unnecessary by

contemporary astronomers, while at the same time Pope Paul II is urged to rehabilitate Galileo. If relativity were wrong, the whole modern *Weltanschauung* would be in jeopardy. But is it scientifically correct to show logic the door, when it points to a possibility which *a priori* is judged unacceptable? Is it right to conclude that geocentrism must be wrong because we do not want it?

The eternal silence of the Copernican-Newtonian spaces terrified Pascal. They terrified the writer, until he found out that there is not one unassailable astronomical observation which compels acceptance of the ruling a-centric paradigm rather than any of the others put forward and believed in throughout human history. This paper argues that man sees what he wants to see, and that he cannot avoid a metaphysical basis for his views, be they religious or astronomical.

Historical and Epistemological Synopsis

Preface

Does space know proper place and movement real rest? The answer depends, as with all answers to all theoretical scientific questions, on convictions already pre-logically accepted and stubbornly adhered to. Or to say it otherwise: the answer depends on "facts" we consider to be self-evident, since from our tenderest years we are told and taught them so often that we have lost even the capability to doubt their truth.

The present paper endeavours to come to grips with one of the most important of such "facts". And the first step this enterprise compels us to take is that we have to decide which of the three methods available for approaching the matter of celestial motions we shall use. Do we prefer to think in terms of mechanical and kinematical analogy or in those of mathematical formalism? Or do we want to halt between those two approaches, switching from the first to the second whenever logical reasoning, leaning on the available

data, obliges us to accept a conclusion that we *a priori* judge to be unacceptable?

The first method is the classical one. The second cannot be used in a simon-pure form, for it has still to reckon with immutable givens in rock-bound reality. The third possibility is our century's escape route from the morass of anomalies clustered around the notions of definable cosmic movement and rest, a morass in which at the turn of the century the practitioners of three hundred years of astronomical "New Science" found themselves bogged down. Now, such a hybrid approach may not necessarily produce misleading cosmological models, but it surely can and does make room for inconsistent argumentation. Applying mathematics as part of a process of elucidating matter-bound observations is not the same as using these observations for the purpose of justifying matter-free mathematics. Newly discovered phenomena may compel scientists to change their theories, but no thinkable theory is able to change the "raw" phenomena. Furthermore, to accept anything as "proven" is not the same as actually having proved it. "Proof" and "disproof" in the commonly accepted sense of giving absolute truth may even be argued to be chimerical, since only omniscience would not have to reckon with the possibility of unexpected input, always again spoiling our mortal certainties.

The discussion will in this paper be strictly confined to a kinematical inquiry, that is, to the question whether we do or do not have, or can find, a firm and absolutely coordinated hold on the space in which we observe motions relative to ourselves, a space to the modern mind only conceivable as infinite and nowadays characterized as "unbounded". Only when such is

unavoidable will theoretical deliberations about attributes, content, and extent of this space be touched upon, since the chosen line of access presupposes adherence to the common-sense spatiality of workaday kinematics, that is, the spatiality - a circumstance often conveniently overlooked! - beyond which theorists can only offer ingenious mathematical derivations that supersede our perceptible and perceived reality. For *nolens volens* theorists can do no more than analogically explain these derivations and the hypotheses extracted from them by means of "flat space" models, ironbound as they are to the three dimensions and the untouchable, not to be manipulated by time, in which their minds are created and constrained to operate.

Many will claim the method used here to be outmoded for any other than low-level workaday operations. Maybe so, but we should not forget why, now almost a century ago, the flight into a fourth dimension, a so-called "space-time continuum", was urged to be theoretically necessary. In the closing of the eighteen hundreds, experimental evidence and the ruling Newtonian world view had become increasingly difficult to reconcile. The Earth seemed at rest in the stellar domain, and this being "unthinkable"(2) in Newtonian terms, a way had to be found and a device adopted that logically forever would banish such an "impossible" state of affairs. Yet, however "unthinkable" and "impossible", this geocentric abomination is not "impossible" after the manner of a square circle. From our earthly perspective we experience it all the days of our lives. Hence unless and until it logically leads to antinomies, there are no valid reasons to prohibit and condemn the use of "flat-space" kinematics. For

procedures, theories and hypotheses may rise and fall -the logic employed in their construction is not subject to human whims, while on the other hand Einsteinian demonstrations by means of analogies are never strictly compelling. They may elucidate difficult postulates but do not "prove" them.

The Cosmic "Outside" Allows No "Insiders"

Does the observable universe contain a pivot? Until Copernicus declared the Earth to be in motion there had virtually been no problem on that score. Our home in the Heavens clearly was the standard of rest and consequently all motions relative to it were considered absolute. Though of necessity today still fruitfully used in every applied science, this is a view that no scientist worth his salt considers actually "thinkable". Only among uneducated obscurantists it still finds favour. However, it normally escapes everybody's attention that until Heaven falls there remains an ultimate uncertainty as well for the very many who eschew, as for the very few who hold the old geocentric position, an uncertainty beyond the reach of science. "Whether the earth rotates once a day from West to East, as Copernicus taught, or the heavens revolve once a day from East to West, as his predecessors believed, the observable phenomena will be exactly the same", to quote the late Bertrand Russell, (1872-1970), whereupon he rightly remarks: "This shows a defect in Newtonian dynamics, since an empirical science ought not to contain a metaphysical assumption, which can never be proved or disproved by observation".(3) And I add: hence a defect in all kinematics as well as in even the purest mathematical

approximations, since we can neither prove nor disprove the existence of an extra-cosmical reality, nor to the least degree be certain how things will look or interact, seen from such an "above". There may be "rumours of transcendence in physics", but the most that can be said about the majority of these rumours is that "they raise important questions about the nature of reality, but are helpless to provide answers".(4)

Be this as it may, and as I deem it is: unavoidably when tackling the enigmas of motion and rest, "every object we perceive is set off by us instinctively against a background which is taken to be at rest", to cite the late Michael Polanyi (1891-1976).(5) Regrettably however, as C.S. Lewis remarks: "Instinct is a name for we know not what",(6) and scientific ukases issued from such a shaky point of view are therefore, it seems to me, highly suspect. Yet such ukases are the stock-in-trade of the ruling astronomical paradigm. And easily, but also again and again inconsistently employed, they fudge Russell's inadmissible metaphysical factor in virtually all cosmological deliberations and *Gedankenexperiments* about motion and rest.

The Armstrong Alert

"There are few words which are misused in physics as much as 'observer'. Sometimes it seems to mean 'receiver', sometimes 'bystander'".(7) This trenchant remark by the late Harold L. Armstrong (1921-1985), which I for myself have dubbed the *Armstrong Alert*, we cannot take to heart enough when dealing with relative versus absolute cosmic motions. To neglect it - I speak from sad experience! -- is to court defeat in debates

and disaster in deductions. (Even when outlining this essay, however much aware of the danger, I caught myself napping). A bystander is by definition not involved with, or a partaker in, the act or process he is looking at. And the point the *Alert* impresses on us is that relative to the Universe as a whole we can only be "inside" observers, not bystanders surveying that Universe in its entirety and determining its manner of motion - if any - from a platform at rest against a background at rest. Yet the fact is that we ever and again unthinkingly slip into an attitude of mind that forgets this cerebral trespass. Even worse: in our ratiocinations we may jump from "inside" to "outside" and back again without realizing the fallacy of not taking this jump into account. It will sometimes, and in the present paper unavoidably, become necessary to talk "as if" we were bystanders, but only for a Bystander, Who ever was, is, and will be, is the Universe truly an "object" transcended by Him.

Two striking examples, culled from among the many that are readily available, will illustrate this ever present fallacy. When Martin Gardner, enthralled by Einstein's theories, attempts to demolish the late Herbert Dingle's arguments against the validity of the notorious Twin Paradox, he is forced to admit that Dingle has a point. Whether the spaceship with John aboard is supposed to move rapidly away from the Earth, or the spaceship is taken to be the fixed frame of reference and stay-at-home James is condemned to blast off into the wild blue yonder - it makes, there being no absolute motion, mathematically no difference. Yet, Gardner pontificates, Dingle is wrong when he therefore does not accept the paradox. "Why wouldn't the same

calculations, with the same equations, show that earth-time slowed down the same way? They would indeed if it were not for one gigantic fact: when the earth moves away, *the entire universe moves with it*" (Gardner's italics).(8)

Restricting the argument to the motions involved, we can only say something sensible about those when we judge them against a background taken to be at rest. "Inside" the box of the Universe modern science acknowledges no absolute motion to be observable. It is hence six of one or half a dozen of the other whether John leaves James or James leaves John behind - a background against which to judge the matter is immanently not in sight, and Dingle's conclusion can therefore kinematically not be faulted. However, our relativity apostle Gardner now plays a "jack-in-the-box" game, and by doing that snatches, he thinks, victory out of the jaws of defeat. *Apropos* of nothing he propels himself in his imagination out of our cosmical box to a place absolutely at rest against a background at rest "outside" our Universe, from which transcendent platform, he assures us, we shall see his "gigantic" fact. Or if we prefer to state it otherwise: from a foothold "inside" the Universe, but independent of it, taken to be at rest as observed from that extra-cosmical platform, he can show us the difference between the immanently relative motions of spaceship and Earth.

What Gardner does not realize is that by using the notion of a moving Universe he is *de facto*, as Russell would say, fudging a metaphysical argument into the discussion. And neither good, nor bad, nor bogus science should be allowed to get away with such statements about observations that can only be made from the

inaccessible regions beyond the starry dome - they are, alas, not in the province of physical science!

Earlier in the same context Gardner still reasons soberly -- scientifically. "Do the heavens revolve or does the earth rotate? The question is meaningless. A waitress might just as sensibly ask a customer if he wanted ice cream on top of his pie or the pie placed under his ice cream."(9) But does this tally with the position he takes in the Twin Paradox controversy? If it makes a gigantic difference whether either the Earth is moving or the spaceship, is it then meaningless to ask whether from the unattainable viewpoint Gardner adopts *contra* Dingle there is no difference between an Earth at rest and an Earth rotating in at least a kinematic sense? Is it not inconsistent and unscientific to introduce an imaginary extramundane observer when one is logically pinned down, but to shy away from that tactic when one deems it expedient to forego a "meaningless" metaphysical view?

"Is the universe rotating?" P.Birch has asked.(10) "Yes, of course", a Christian simpleton will answer, every day we see the stars revolve around us." Yet too hastily, I think, all and sundry will laugh this fellow out of court. For the term "rotation", if it is to mean anything, presupposes an axis at rest against a background at rest. But such a hold, 20th century science acclaims, we do not have. Clearly the only sense in which Birch's question makes sense is that he is asking whether, from a rockbottom position outside the Universe, or from a viewpoint extra-cosmologically guaranteed to be at rest "inside" it, there exists an axis around which the starry dome, carrying all celestial bodies, is seen to be rotating. This means that he

is leaning on the broken reed of a metaphysical presupposition, which hence entails that, *e.g.* the "New Scientist", if it wants to judge justly, should vilify him as it vilified Hoyle for the invocation of supernaturalism in the latter's "The Intelligent Universe". For Birch, by asking the above question, which is only extranaturally answerable, has, like Sir Fred, "betrayed the very standard which the scientific community has been built".(11)

Compared with Birch's unreachable and therefore non-scientific point of view, that of the geocentric simpleton is *ergo* on two counts slightly better founded. The latter, first of all, has the witness of everyman's straightforward observation on his side, and secondly, he openly states that he accepts the metaphysical message of the Bible, which message, when read without preconceived notions, takes the central position of the Earth to be simply self-evident. For, it reminds us, the Creator had in the Heavens already hung that Earth upon nothing three days before Sun and Moon, and the stars also, were called into being. We may reject said message as quasi-transcendent information, but it at least claims the support of a long and venerable preCopernican tradition in natural philosophy, whereas Birch, apparently not realizing what he is doing, sins against the central tenet of post-Copernican, this-worldly "new science", which tenet does not allow a *meta*, a "behind", in the realm of physics.

I therefore hold and repeat that we shall do well to have a careful look at the cavalier manner in which theorists manipulate rest and motion in their treatment of the problems these concepts set them. What in one context, they assert really moves, is in another context

said to be at rest, and *vice versa*. Worse, and I obstinately want to drive the charge home: in their deliberations they instinctively deem themselves the equal of Aristotle's Unmoved Mover and have virtually succeeded in prompting all of us to join them in committing that folly. They look at the totality of being in the manner we as children have been brainwashed to look at drawings of the Solar System. Not to mention, later on, at the rotating discus of a Milky Way of stars adrift among the countless galaxies contained in an astounding variety of models of the Universe! But that Universe is not an object which we can observe against a background at rest, and those models we cannot identify with the real. Finding ourselves in a room of a large building we may draw blueprints of that building to our hearts' content; however only after stepping outside shall we be able either to verify or to reject our fancy figurations. Nobody can turn around and look objectively at the Universe he shall have left behind. The vacuity of the transcendent foundational fiction that such extra-cosmical kinematical judgments are possible disqualifies, soberly beheld, any confident assertion about any body orbiting another one. As far as this is concerned there is but one seemingly unblemished astronomical and soberly-scientific approach: that of the anti-absolutist Ernst Mach (1838-1916), for whom only relative motions existed.

Geocentric? Heliocentric? The Janus-Faced Aberration Can't Tell

The present paper is intended to reconsider the reason why George Biddell Airy (1802-1892) is presumed to have failed to resolve the quandary whether astronomical aberration shows a starry dome very slowly orbiting the Sun, and with this Sun orbiting the Earth, or whether contrariwise we orbit a Sun, which for that purpose is taken to be at rest in said dome. It will only deal with the kinematical aspects of the affair and will discuss the subject matter from a modest pedestrian position. That is from the celestial body on which mankind finds itself, taking nothing *a priori* for granted about that body's status in the cosmos observable around it. And in doing that it will be earning - until further notice! - the "New Scientist's" accolade for not betraying the very standards on which the scientific community has been built.

To begin with: non-astronomically informed people still cherish the tough untruth that Galileo, risking martyrdom for the sake of the true truth, irrefutably proved that the Earth "goes around the Sun". Those who are to some degree familiar with the history of astronomy know better: the man had no unequivocal evidence at all for his heliocentric model. Granted: at first sight and overlooking the square and higher powers of the eccentricities of the planetary orbits, it seems simpler than the Ptolemaic one, and Occam's razor hence advocates the acceptance of the hypothesis. Yet, simplicity is decidedly not the hallmark of the Great Chain of Created Being. Galileo's observations showed him that it was possible and attractive to look at the

heavens heliocentrically, not that such was on any account necessary. And today this is still, or better, again the situation. "We can't feel our motion through space; nor has any experiment ever proved that the earth actually is in motion", says the author of a book that Einstein declared to be "a valuable contribution to popular scientific writing".(12) Furthermore: everyone who has investigated the matter and its ramifications knows that from the lifetime of James Bradley (1692-1762) until our days, (with their rising number of anti-relativists!) scores of experts have applied themselves to the task of either demonstrating the Earth's motions, or conversely, to devising theories that acceptably try to explain why these motions cannot be demonstrated. The latter surely being quite an undertaking, because it first of all requires incontestable evidence that Mother Gea is not only relatively, but really in motion, and subsequently a proof that proving that motion is impossible. For after all: to declare an Earth at rest to be unacceptable is not the same as authenticating it to be on the move!

The Fancy Foundations in the Beyond

I do not want to leave anyone in the dark about my own position. Allow me to present it whilst from a different perspective exposing the ontological fallacy already laid bare in the foregoing. On close inspection Russell's defect in empirical astronomy, mentioned in the beginning of this essay, is even more glaringly overlooked in post-Copernican hypotheses than consciously realized in its pre-Copernican theoretical superstructure. However, from Aristotle (384-322 B.C.)

until Tycho Brahe (1546-1601) the Earth's central position was in our western civilization openly or tacitly acknowledged as in the last resort metaphysically founded. Mother Gea's absolute rest in the middle of the material Universe was affirmed by natural philosophy, either as self-evident in relation to the Empyrean or else as clearly assumed by the Bible, the trustworthy Message from the Great Beyond of highest Heaven.

Galileo's and Bacon's "New Science", still proclaimed from the rooftops, began - and at last now practically has completed - the wearying process of brushing away the lingering cobwebs of such superstitions. The modern view, as Laplace already assured Napoleon, does not need the hypothesis of an unprovable Creative Intelligence. Yet, unprovable is, logically appraised, not the same as disprovable, or disproven, and to overlook that is an act of unforgivably shallow self-deceit. Laplace, the "New Scientist", and their manifold epigones are "looking at" the Universe in the manner in which they here below, comfortably seated in their studies, can look at man-made celestial globes. Yet about the station and formation of those they are, by the very nature of the case, competent to make only worthless, petty pronouncements. In their prideful imagination they ascend to supermundane platforms, which they instinctively "know" to be at rest as surely as they themselves are at rest relative to their desks. However, these extra-cosmical viewpoints they can neither actually point out to us, nor in any way prove to exist. We just have to believe them when they assure us that observed from those chimerical lookouts the Earth is no more than a speck of dust among countless others, all and everyone resulting from a Big Bang set off by

nobody in nothingness. In other words: they expect us to hail them as newly evolved gods, now effectively replacing, they have convinced themselves, that imaginary Ancient of Days in Whom their ancestors put their trust with regard to our position in His creation, before Galileo enlightened them.

However, comparing the credentials of these latter-day self-made gods of flesh with those of an Eternal Creator, Who after all may have revealed Himself and might on a coming *Dies Irae* do this again? We shall, as Pascal's wager puts it, lose nothing if we reject the pontificating puny idols with whom modern science has cornered the sublunar astronomical marketplace. Dust to dust, ash to ashes! On the other hand - not so small a chance, I reflect, when studying the all sciences and engineering encompassing wisdom displayed in the precisely adaptive structures of the Solar System and every living thing... on the other hand: what if there is an Omnipotent Being above all temporal being? A God of great promises, Whose Suffering Son has told us about those promises and the coming Kingdom? A God - to formulate it in a way a benevolent outsider would allow - Who during the present age of our world for His own omniscient good reasons seems to confine Himself to only showing His handiwork upheld and trustworthily regulated by His laws for the Universe that He has created? A God, Who is working out a plan here below, and Who for its completion in a, for that purpose, amoral setting wants us to show our mettle in choosing between good and evil, radiating faith, hope, and love even in adversities and sorrows, instead of only looking after Number One? A God, Who created all the lights, great and small, in the

firrnament, to divide the day from the night and to be for signs and seasons in behalf of mankind, to which He has allotted an Earth that cannot be moved, whatever those ephemeral tin-pot deities like a Gould, a Sagan, a Jastrow, "reveal" to the contrary? And maintain *Anno Domini* 1988 with a weird assortment of *ad hoc*s, which logically evaluated are not truly testable and hence worthless?

I find the choice not difficult to make between a "sure" - we are assured! - nothing and a not impossible something. It is easier for me - and that not only for promptings of self-interest - to believe in a world *sub specie aeternitatis* than in the monstrous, meaningless space-time Universe depicted and preached by the self-levitated and self-supernaturalized mortal protagonists of modern astrophysics. And those who on this certainly momentous issue label my words as wishful thinking I answer with a *tu quoque*: scientism's demi-gods of man's devising are nowadays in the same boat with regards to the incontestable truth of their prophetic utterances. For the modern philosophers of science have at long last again become aware of a certainty that wise men have always known: theories "saving the appearances" are at best no more than logical possibilities without any trustworthy claim on the truth. As one of them, Lewis Thomas, has succinctly expressed it: "Science is founded on uncertainty... We are always, as it turns out, fundamentally wrong".(13) Because of wishfully hoping to escape from a teleological Universe, I add!

I crave the reader's indulgence for this seemingly ill-fitting digression. However, I do not apologize for it. In fact it fits and was necessary. Astronomy is the oldest

of the sciences, and revolutions in its realm precipitate upheavals in all human thinking. For the first most simple pre-scientific question we can ask is at the same time the last most profound ontological one that we can ask about all things visible. Is what we see and feel the true state of affairs or a deplorable illusion? Do the Heavens revolve or does the Earth rotate? Scientism, its prophets thinking everything except themselves away⁽¹⁴⁾ and believing they can sit in the Temple of God showing themselves to be God, proclaims the second alternative. I proclaim the first. The difference - allow me to repeat it - between us with regards to the matter here at hand is that those prophets are not aware of their self-made metaphysical starting point, or else prefer not to mention it when they are hammering home their monistic meaninglessness of all that is. On the contrary I freely and openly profess Holy Writ to be my lodestar when I defend here a geocentric, astronomically pre-scientific, view.

To conclude: the choice between the Universe as seen by men arrogating to themselves a metaphysical position and as seen by Him, Who claims to be its Creator, I find not difficult to make. Ever-changing human confabulations consistently dismissing former views as short-sighted after new discoveries - how can anybody trust those chancy guesses as scientific truth? Especially since those guesses subtly but steadily have been used to erode mankind's inborn conviction of a mysterious meaning behind, beyond, and above our mortal life? That erosion has now reduced us to blobs of plasmatic matter, somehow having become sentient during the senseless aftermath of a Big Bang. Copernicus may not have foreseen the consequences of his

theoretical dethronement of the Earth. But where is the historian who denies that the acceptance of Galileo's folly, its foundation laid by the Italian Renaissance preceding it, has not totally changed the world-view of countless millions? And who does not realize that hence its demise might well cause many humans to re-assess their humanity as a precious gift with a glorious future in an age to come?

Aberration, Continued

In a short paper it is impossible to enumerate those fruitless efforts of three centuries, all trying to establish incontrovertibly the veracity of Galileo's legendary "*Eppur Si muove!*". Those interested in particulars will find them sprinkled throughout the extensive literature dealing with the issues involved.⁽¹⁵⁾ For the purpose at hand we may restrict ourselves - as a cursory view of history clearly intimates - to a crucial experiment at the crossroads of classical and relativistic science. To wit, as already mentioned, the test performed in 1871 by Airy, a test more than a century earlier suggested by a forgotten genius, Ruggiero Guiseppe Boscovich (1711 -1787).

Since the readers for whom this essay is intended range, professionally grouped, from interested laymen to doctors in astrophysics, I am compelled to be popular without sacrificing correctness and to elaborate where for those "in the know" a single sentence would suffice. Only one mental favour I must ask all of them to grant me. It is that for the sake of argument they suspend or forget for a few minutes a fact they already "know" or are convinced of, *i.e.* that the Earth is no more than an

aimlessly through space wandering relatively miniscule satellite of a typical minor star. Those reluctant – very unscientifically, I assert! – to do this I remind of the fact that, so to say, Einstein's general Theory of Relativity has democratized the starry world by conferring equal status to all celestial contenders for the place of kingpin in the heavenly merry-go-round. If however they already balk at the idea that, after all, the Earth could be a strong candidate for this unique position, I regretfully advise them to refrain from even a mere perusing of the argumentation developed in the following analysis of Airy's failure to verify Bradley's account of aberration, in which I point out the purblindness of the scientists' refusal to see the plain truth.

Grasping that nettle I follow, for a short explanation of what said aberration is all about, the Dutch physicist and Nobel prize winner J.D. van der Waals (1837 – 1923), who during his lifetime witnessed the demise of classical science and the emergence of relativity physics,¹⁶⁾ (see figure 1).

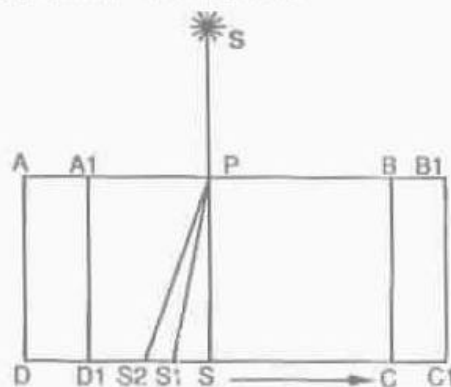


Figure 1

Imagine somewhere on Earth a closed box ABCD with a pinhole P in the top through which a light ray, from a source S stationed in a tower, touches the bottom DC in S. Now suppose that we set our box in motion towards the right. Then the light in a straight line moving ray SS still needs a fraction of time after passing through the pinhole to reach the bottom DC. But during this split second the box has moved to position A₁, B₁, C₁, D₁, and "inside" the box S will hence have veered to S₁ at the left of S. Further: it is not difficult to see that, when we fasten our frame of reference on the box, the path of the light ray will show a slant.

Next we now fill the box with water and repeat our *Gedankenexperiment*. With light source and box both at rest, relative to us and the Earth, nothing alters, but as soon as we again set the box in motion we observe a change. In water the speed of light is about three fourths of its speed in air. Consequently the "wavicles" emanated by S need more time to traverse the box. As seen by an observer situated at the bottom of that box their trajectory is, it follows, more slanted than it was on our first trial run, and they will reach the bottom at S₂.

So far, so good. However, now the action shifts in space and time to a duo of astronomers who became convinced that they had found a phenomenon capable of removing the last lingering doubt whether Copernicus had indeed the right side by the ear. In December A.D. 1725 we see James Bradley and Samuel Molyneux manipulating a telescope fixed to a chimney stack and directed at the star *Gamma Draconis*, almost vertically overhead. Neglecting for brevity's sake the finer points of the affair: prolonged observation showed the two stargazers that *Gamma Draconis*, relative to the

earthbound chimney of Molineux's house, in the course of a year described a small circle. By the light of the foregoing their conclusion is easy to grasp and crystal clear: the Earth is moving, and in fact revolving relative to *Gamma Draconis* and hence relative to all fixed stars, the Sun included. More: taking into account the speed of light and the observed angle of aberration, simple trigonometry shows our orbiting home to have exactly the velocity that Bradley already "knew" it had of more than one hundred thousand km/hr. The slightest skepticism remaining about the truth of Copernican astronomical gospel could therefore be laid to rest.

Well, not totally! Logically considered, this conclusion uses that invalid theoretical syllogism, the *modus ponendo ponens*. If situation P is the case, we agree, then we shall observe the phenomenon Q. Now indeed we observe Q. Does it therefore follow that P is the factual state of affairs? By no means necessarily, for Q may be caused by a variety of other circumstances. As one of my textbooks of logic remarks: "We shall have frequent occasions to call the reader's attention to this fallacy. It is sometimes committed by eminent men of science, who fail to distinguish between necessary and probable inferences, or who disregard the distinction between demonstrating a proposition and verifying it".(17)

"Aberration", to quote van der Waals, "may equally well be squared with the supposition that the stars indeed describe circlets. And though we find the latter explanation improbable and prefer the first, the question may arise: is it in no way possible by means of observations to decide which of the two suppositions is the right one?"(18)

Boscovich, sensibly and objectively not inclined to

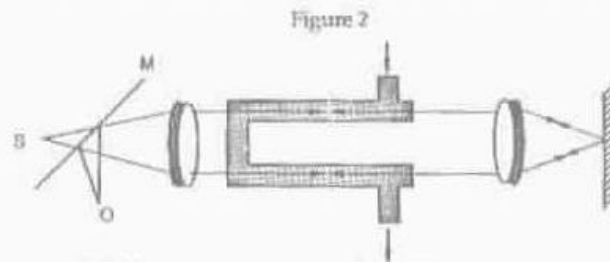
put all his theoretical eggs in Bradley's logically bottomless basket, saw a chance to do just that. And many an astronomically non-conversant reader, having followed the discourse thus far, may already have realized that chance also. Fill a telescope with water and measure the aberration angle for any fixed star. If the angle in this manner obtained is larger than the one measured by Bradley, the Earth indeed orbits, relative to firmament and Sun. If no different value is registered, then the starry sphere swings, with the Sun on which it appears to be centered, around that beautifully blue-and-white marbled "planet" Gea.

Unlike the conclusion of Bradley's invalid *ponendo ponens* argument, which by affirming affirms, this reasoning in the *modus tollendo tollens*, the mood which by denying denies, cannot logically be faulted. If P, then also Q, and hence if no Q, then no P. The outcome of the experiment will settle the case unless, of course, we may not like the verdict and therefore refuse to accept it!

For more than a century after Boscovich suggested this verification of the heliocentric theory nobody of any astronomical consequence thought an effort to execute it worth the trouble. Bradley, after all, had only and somewhat superfluously confirmed what on the authority of Copernicus, Kepler and Galileo -- with Newton standing on the shoulders of those giants -- everybody knew to be true. Why bother to lay bare the glaring untruth of Tycho Brahe's nonsensical scheme? As far as this is concerned we may for the ruling consensus from 1726 until today well quote the late (from relativist to anti-relativist converted) Herbert Dingle that "surely no one in his senses would now maintain that the Earth

provided a standard of rest for all the light in the Universe.(19)

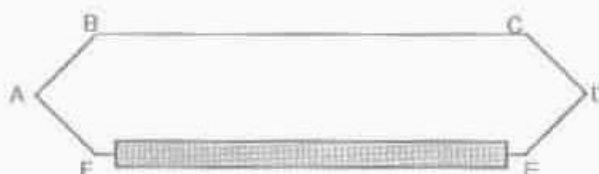
Yet progress of the sciences during the nineteenth century evoked such a welter of conflicting theories about aethers, spaces, and motions(15) that in 1871 Airy, taking his clue from Boscovich, decided for once and for all to measure that supposed alteration in the amount of stellar aberration by means of a water-filled telescope. He had no great expectations about a decisive result, since trials conducted by the German Klinkerfuesz and the Dutchman Hoek - more about the latter later! - had already presaged a failure to find any alteration in Bradley's 20".47 angle.(20) And indeed that failure turned out to be the case, wherefore the only remaining difficulty was how to explain such a seemingly Ptolemaic result in Newtonian terms. Happily the means to do this were available ready-made, for half a century earlier, after considering an experiment by Francis Arago (1786-1853),(21) the French physicist Augustin Fresnel (1788-1827) had devised a theory that offered the needed solace.(22) Taking his clue from the fact that the square of the speed of sound in gases is in inverse ratio to their specific gravity, and assuming an elastic-solid aether, Fresnel had obtained a formula for the velocity of light in moving transparent media involving a factor $1-(1/n^2)$. This so-called "dragging coefficient" was in 1859 tested by Fizeau (1819-1896), whose affirmative results, after much travail, were in 1886 by Michelson and Morley found to be "essentially correct".(23)



In Fizeau's experiment (see figure 2) two parallel light rays are sent through an U-form tube of glass containing fast-flowing water, the one ray clockwise, the other counter-clockwise. And both are after their return via a semi-transparent mirror: M observed in O. Now: "if one moves relative to the aether (assuming that it exists) then the speed of light must be increased by the speed of the relative motion. Thus the speed of light in a material which moves with a speed u against the direction of motion of the light becomes $(v+u)$, if the speed in the material at rest was equal to v ... The outcome of the experiment was, however, quite different from that expected. Instead of the speed $w=v+u$, Fizeau's experiment gave a result which proved to be dependent on the refractive index of the liquid used: $w=v+u(1-1/n^2)$. The only reason that one could think of to explain this result was that the aether was swept with the liquid, although not completely but with a 'drag coefficient' $1-1/n^2$."²⁰

Fresnel's suggestion hence seems to hit the mark, and another experiment, in 1868 performed by the Dutchman Hoek had already ostensibly provided further confirmation. He directed light rays clockwise and counterclockwise around a hexagonal circuit ABCDEF of which the segment FE was a water-filled

Figure 3



tube, (see figure 3). "If this apparatus would stand still, then a difference in their time of revolution is certainly not to be expected. For every segment of the circuit a fixed amount of time will be required, it being a matter of indifference in which way it is passed through. But imagine the apparatus to move from left to right. Then the light rays meet different conditions." That is, as in the case of Fizeau, Fresnel's dragging coefficient will shove in its oar. "Hoek performed the test, and it turned out that between the two times of revolution a difference does not exist. To perform the test he did not have to take great pains to give the whole apparatus a sufficient speed.... The Earth, by means of her rotation and her annual orbit around the Sun, provided a speed that was vastly greater than could have been obtained in any other manner. The result of the experiment only needed to be compared with that obtained when the apparatus was not moving in the direction of the segments CB and EF. This was done by rotating the apparatus 90°, so that those segments of the circuit, which first coincided with the direction of the Earth's motion, after that were perpendicular to it."²⁵

It is not difficult to see the conclusion that Hoek thought he could draw from this null result. Whatever speed v of the aether relative to the Earth we have decided to believe in, be it a few centimeters or many

kilometers - we cannot demonstrate that speed! Sparing the reader the mathematics and neglecting miniscule higher-order terms: if we work it out we find Fresnel's dragging coefficient adequate to explain Hoek's negative result. "If the aether carrying the light moves with a velocity w ... then we find $w = v(n^2 - 1/n^2)$, which is exactly the aether velocity according to Fresnel."(26) After all, convinced as we are that his laboratory was not at rest in the omnipresent aether, but was in any case with the Earth orbiting the Sun at $v = 30$ km/sec, this *must* be true. If the drag coefficient were not this $1 - (1/n^2)$, Hoek would have observed *some* effect! Was this conclusion truly inescapable? Unblushingly to overlook the not yet ruled out most plausible inference - that of the apparatus at rest in space - bears testimony to a willful, prejudiced, unscientific short-sightedness. What if $v=0$ and consequently $w=0$? To get ahead of the argument: only if here on Earth his hexagon moving at high speed also will stubbornly show no interference shall we have to affirm Hoek's explanation. As yet, and without such a control experiment, it seems logically a too hastily accepted conclusion.

Dutifully to follow the storyline taken in the standard textbooks: "An entirely different piece of experimental evidence shows that Fresnel's equation must be very nearly correct. In 1871 Airy remeasured the angle of aberration of light using a telescope filled with water", and "it will be seen that if the velocity of the light with respect to the solar system be made less by entering the water, one would expect the angle of aberration to be increased... Actually the most careful measurements gave the same angle of aberration for a telescope filled with water as for one filled with air."(27)

It was, as said, feasible to explain this strange phenomenon with Fresnel's dragging coefficient, but "a different explanation is now accepted, based on the theory of relativity".(28) Or to quote van der Waals: "It is possible generally to prove how Fresnel's theory entails that not a single optical observation will enable us to decide whether the direction in which one sees a star has been changed by aberration. By means of aberration we can hence not decide whether the Earth is moving or rather the star: only that one of the two must be moving with respect to the other can be established. Fresnel's theory is hence a step in the direction of the theory of relativity."(29)

The 1887 Cleveland Disenchantment

Again: so far, so good. But we may ask ourselves: "If the aether reaches throughout space, does not our Earth move with respect to it? Then there should be a noticeable difference in the speed of light along, and perpendicular to, the direction of motion of the Earth, because of the aether wind which blows unnoticed in our ears and eyes".(30) The reasoning is logically airtight *modus tollendo tollens*. But so is - an omnipresent aether presupposed - the corollary: no aether wind, then no motion!

As everyone knows: in 1887 Michelson and Morley, using an extremely complicated and sensitive interferometer, tried to measure this difference,(31) and -- just like Airy -- drew a blank for the purpose of justifying Galileo. "It appears...reasonably certain that if there be any relative motion between the Earth and the luminiferous ether, it must be small; *quite small enough*

entirely to refute Fresnel's explanation of aberration (32) (emphasis added, v.d.K.). For this 1887 result "is in flagrant conflict with the hypothesis which was put forward to explain Fizeau's experiment. If one performs the experiment in the air, for which the drag coefficient is equal to zero, (the refractive index is almost equal to one), then one expects a displacement, or conversely the negative result points to a drag coefficient of one: the aether travels with the apparatus. There is no aetherwind. We see that all sorts of difficulties arise from the use of the concept of the aether, by which we understand some elastic material through which the light oscillations travel."(33)

On the authority of Niklas Koppernigk it is, of course, declared *ultra vires* to ask whether these difficulties do not disappear like snow under a hot sun if we consider the apparatuses of Arago, Fizeau, Airy, Hoek and Michelson and Morley to be at rest in a space that knows place. The Earth, we have decided to know, is spinning through space. Hence, to cite a twentieth century comment on Airy's mishap: "If the Fresnel drag coefficient be introduced into the calculation of the aberration, there emerges the fact that the aberration is the same with or without water in the telescope. Thus conversely Airy's negative result confirms the validity of the Fresnel coefficient".(34) It of course does not when logically judged. That is: without the unscientific, instinctive, imaginary, and pseudo-metaphysical viewpoint of the heliocentric and a-centric confessions of astronomical faith. As until today all logically valid *tollendo tollens* experiments after the style of Michelson and Morley have shown: if there is a light-carrying aether, our instruments are not travelling through

that aether - the isotropy of space investigated from, or relative to, the Earth has never as yet been seriously called into question. Hence in Airy's case the drag coefficient is absent and cannot be dragged into court to vindicate Copernicus.

Whichever way we turn: after 1887 there clearly was the devil to pay with regard to the permissible particulars of the cosmic clockwork suspended in any form of the luminiferous stationary aether. It is not necessary to enter into details about the input and output by Stokes, Fitzgerald, Lorentz, Poincaré, and a host of minor celebrities, all of them trying to devise a way out of the *cul-de-sac* in which classical Copernicanism found itself. By 1897 Michelson aptly summarized the situation as follows.

The Dire Consequences

"In any case we are driven to extraordinary consequences, and the choice lies between these three:

1. The Earth passes through the ether (or rather allows the ether to pass through its entire mass) without appreciable influence.

2. The length of all bodies is altered (equally?) by their motion through ether.

3. The Earth in its motion drags with it the ether even at distances of many thousands of kilometers from its surface."(35)

Now, first of all, it is strange that this lifelong agnostic Albert Abraham Michelson (1852-1931),(36) appears on one issue not in the least agnostic, but as firmly a fundamentalist Copernican believer as the staunchest Bible-reader who holds on to his Authorized

Version. There is no place in Michelson's only partially agnostic tunnel-vision for possibility Number Four. Yet, aside from any appreciation of its value, a geocentric explanation of the enigmas encountered in the search for the true model of the cosmos... it stares, I repeat and maintain, any open-minded down-to-earth scientist in the face when he surveys all those abortive efforts to disqualify it.

Apart from that, and too easily forgotten: none of these three theoretical attempts to save the appearances, nor sagacious variations on their themes, are without drawbacks or contradictory experimental evidence even when one observes them from the accepted, if unattainable, heliocentric super-cosmical viewpoint.

Michelson's first extraordinary conclusion may explain his 1887 failure, but it resolutely disqualifies Fresnel. Even worse, for this being the case, Boscovich's logically and classically impeccable test for pinning down the true cause of aberration then shows the Earth to be at rest, independently from Michelson's own result witnessing to the trustworthiness of this conclusion. Otherwise Airy would have observed an increased angle of aberration for his water-filled telescope, in this case not affected by such an evasive Fresnel-type aether wind.

The second option, the Fitzgerald-Lorentzian one, does not fare much better, and Michelson's "equally?" in brackets reveals already its invidious shortcoming. If all bodies moving relative to a stationary aether would expand or shrink at specific and hence presumably unequal rates, we theoretically should, by using measuring devices with different contraction coefficients, be able to pinpoint absolute motion. However, (*e.g.* in the many variations of the Michelson-Morley experiment

subsequently performed), not the faintest indication of such an inequality has ever been found. Until a deviation from its general applicability will be observed the "equally" hence stands. But that means bolstering the case by means of introducing unobservables. And to quote D.W. Sciama, there is a "fundamental reason for objecting" to such a theory. If the length of all bodies is altered equally by their motion through the ether, then these alterations "cannot be observed except through the very phenomenon they were invented to explain".(37) As Louis Essen, with a typical British understatement, comments on Lorentz' clever *ad hoc*: "This theory was put forward very tentatively and was not generally regarded as being entirely satisfactory." And let me add, to prevent an indignant "Yes, but...", Essen's next sentence. "The Lorentz transformations are the basis of the special theory of relativity, but Einstein derived them from two assumptions of a general nature, which he raised to the status of principles "(38)

Michelson's third intimation looks, Copernically considered, the most promising. Subsequently it has been and is being put forward in many variations on the original theme by a G.G. Stokes (1819-1903) proposed "aethersphere", which Michelson, until Einstein's appearance on the scene, "was to revere above all others".(39)

It cannot be denied that such semi-geocentric hypotheses take Hoek, Airy, and Michelson & Morley in stride. However, as long as the diameters of the envisaged Earth-bound aether "bubbles" are not experimentally established and their structure - whether homogeneous, stratified, or vorticose - elucidated, these explanations of the unexplained suffer from the same

shortcoming as the Lorentzian one. Not yet in the least verified *ad hocs* fail to qualify as arguments, let alone as "proofs". They are by themselves only woolly excuses. Worse: until logically incontrovertible test results in their favour will have come to the fore the skeletons of Ptolemy, Aristotle, and Tycho Brahe still rattle happily in their cupboards. Just postulate not an "aethersphere" embracing Mother Earth, but a "galactosphere" encompassing the stars. Then you will have come close to enthroning Tycho Brahe!

The Verdict of Logic

To the foregoing remarks an epistemological addendum is, sadly, yet in order. In a survey of the theoretical ratiocinations employed by all such classical scientific defenders of the Copernican confession, one aspect stands out for everyone to see: without exception they either use the logically invalid *modus ponendo ponens* (MPP) to escape from any valid *modus tollendo tollens* (MTT), or else they take refuge in unverified or unverifiable *ad hocs*. A short digression may help to make this clear.

Suppose that during a simple optical test I see a green light. I know a green source will produce green radiation. However, if I reject the clear conclusion that the observed phenomenon is caused by a green lamp because I believe only yellow lamps to be possible, then I can adhere to my firm faith by presupposing that somebody is holding a panel of blue glass between me and the light source. The anyway overhasty MPP conclusion that this source is green therefore does not impress me in the least. To my conviction of "yellowness

alone" I may with perfect logic still stubbornly cling.

The other way around: forsooth, a yellow lamp will doubtlessly emanate yellow light. But I see a green glow, and therefore its source cannot be yellow. Have no fear - I again postulate the blue glass and in doing that neatly evade the scrape in which a valid MTT threatened to catch me.

All jesting apart: those blue-glass *ad hoc*s are, of course, worthless exhibits of wishful thinking. Sober-scientifically they are without any value until I shall have observed these in-between panels of glass on the spot and in that way am able to demonstrate the actualness of my *ad hoc*s convincingly. And these considerations with regard to compelling verifications count for all hypothetical, logically-correct syllogizing. The strength of conclusions drawn from straightforward interpretations of observations depends squarely on the premises and the additional *ad hoc*s employed. If those premises and *ad hoc*s are unverified or non-verifiable, then the conclusions rest, ten to one, on quicksand. True scientists should shy away from prejudiced hypotheses of that kind, but they often do not. If they feel their *Weltanschauung* threatened by what are for them unpleasant actualities, then any reasoning warding off such an unpleasantness will do!

Evaluating the cogitations of self-professedly unprejudiced science before the tribunal of logic we find this blue-glass trick, time after time, employed in the use of both theoretical syllogisms. For instance: the Boscovich-Airy reasoning is logically impeccable MTT. If P then Q - no Q, then no P. If we are on the move then stellar aberration observed through water will be greater than that observed through air. Therefore in case we do

not observe this increase the Earth is at rest and the starry dome is revolving relative to us. But Airy had already decided to know - be it on no experimentally observed sublunar solid and indisputable grounds whatsoever! - that this is not and can not be true. Hence he and his supporters looked around and found applicable rational evidence that obviated the horrendous necessity of siding with the Inquisition in the Galileo trial of 1633. As already shown: an aether drag only demonstrable for water in motion relative to an observer provided the helpful *ad hoc*. Alas - not at all. That *ad hoc* is obtained by means of an MPP, an affirmation of the consequent. Before we can use it we shall have to demonstrate that Fizeau's experiment registered no more than a change in a drag already present in the water travelling with the Earth, for exactly that motion is on trial. True enough: if the Earth is moving through a luminiferous aether, or through a spatiality "at rest", however conceived or defined, and Fresnel's coefficient hits the nail on the head, then water-filled telescopes will not register increased aberration. No increase is observed, and hence we may conclude that Airy's test result is in complete harmony with Newton's vision. Well and good, but for an Earth at rest relative to space (or whatsoever mysterious entity it is in which or through which light travels at the constant velocity c), the Fresnel drag inevitably is reduced to zero and does not affect our measurements of stellar aberration as "explained" by Bradley.

The whole reasoning is a prime example of begging the question. Only after an experiment like that performed by Hoek in 1868, or that proposed by me for the first time in 1968, shall have been performed in *e.g.* a

Concorde or space shuttle, and then will have given a negative result, will I be obliged to accept Airy's verdict, because in that case it will have become clear that indeed Fresnel's drag coefficient masks any change in motion or a change from rest to motion.

We shall therefore be well advised not to go beyond the inductively well confined and never yet successfully disputed absolute and constant velocity c of light *in vacuo* as independent of its source and the same for all Earth-bound observers. Disputed by measurements in flat space, that is - the only space, we should not forget, in which we are able to measure! And then it becomes difficult for Airy, et al, to vitiate their MTT reasoning. We may, as has been done and is done, throw in logically possible ad hocs, but so long as such ad hocs are not beyond doubt experimentally proven that procedure does not cut ice. No penny, no paternoster; no pay, no piper. If no fringe displacement correspondent with the Earth's supposed velocity, then no orbital, let alone galactic, motion of our globe through a relative to it stagnant luminiferous aether.

In Michelson's heliocentrically preconditioned mind the obvious corollary, a simple straightforward geocentric hypothesis did not get a chance to rear its unwanted head. A model effortlessly explaining Bradley's, Hoek's, Airy's, and his own test results?... Now or ever: never! Mortal men's habitat the gudgeon on which the Heavens turn?... Who can still believe such a medieval superstition? Referring the readers to that blue glass panel that spoiled the simple syllogisms: Michelson searched for and found those three helpful *ad hocs*, three pretexts able to ward off a disturbing and unwanted perspective. However, as I have shown: none

of that MPP trio is strong enough effectively to disavow the logically compelling MTT he himself and Morley had confidently applied when constructing their interferometers.

Einstein to the Rescue?

It is well known that Einstein at different times and occasions, for understandably different reasons, gave different answers to questions about the occurrences that had prompted him to his views on motion, rest, and space-time. "By his own account the experimental results that had influenced him were the observations on stellar aberration and Fizeau's measurements on the speed of light in moving water. 'They were enough,' he is reported to have said in 1950."⁽⁴⁰⁾ Yes, and I think I understand the sentiment motivating him. If we cannot prove what we *a priori* "know" to be true, then we have to find a reason why such a proof eludes us.

Yet I will be the first one to admit that his clarification of the enigma baffling Michelson and his followers is a masterful movement of thought in a great and subtle mind on a high level of abstraction. Given the post-Christian *Weltanschauung* of our time, it is for those enmeshed in it pretty much mandatory to believe the relativity postulates. Surveying the struggle to keep Galileo enshrined, notwithstanding the accumulating evidence to the contrary, and recognizing the inefficacious logical shortcomings of every argument employed, they cannot but side with Einstein. With him they have to hail all those Copernican crusaders aspiring to a rational solution with an "A plague on both your

houses!" For indeed, if the logical inference, time after time looming behind thought and test, is by all and sundry being declared impossible since unacceptable, then the only way out of the impasse is a move to supersede logic. That is to say: nothing less than a premise capable of turning all evidence favouring a geocentric Universe into evidence for an a-centric homogeneous one will suffice. But two wrongs don't make a right!

Permit me, before I pursue the matter any further, to quote a wise warning by Sir Arthur Stanley Eddington (1882-1944). He himself certainly did not heed it when he presented the results of his 1919 SobralPrincipe eclipse expedition as hard facts, for today the scientific establishment looks at those askance.(41) Yet Sir Arthur's warning is thereby not disqualified. One man's failing is another man's lesson - we should, and I shall, take Eddington's *caveat* to heart.

"For the reader resolved to eschew theory and admit only definite observational facts, all astronomical books are banned. There are no purely observational facts about the heavenly bodies. Astronomical measurements are, without exception, measurements of phenomena occurring in a terrestrial observatory or station; it is only by theory that they are translated into knowledge of a universe outside."(42) So it is, and setting theory against theory in the quest for knowledge I hold that truly objective and unprejudiced appraisers will acknowledge a glaring datum. To wit: logically evaluated the contra-Copernican testimony willy-nilly obtained by level-headed classical experimental science is not overwhelming only for those who with open eyes decide to be blind. Airy and Hoek were compelled to

accept as already proven what was - and is! - not yet proven: an omnipresent Fresnel drag caused by an at least 30 km/sec aether wind in all transparent materials, whether water, glass, perspex, champagne, or castor oil. However, no observer at rest on the Earth's surface can measure this drag as such. Only a supposed "change" in that drag becomes visible by setting these substances in motion relative to such an observer. Michelson and Morley, on the other hand, found the luminiferous aether nearly unaffected by the motion of the matter that it permeates. Hence it can be argued that Fresnel's theory holds for transparent substances moving through an aether at rest and therefore can only be measured by an observer at rest in that aether. Which is tantamount to saying that Hoek and Airy, (observer and substance both at rest), Fizeau, (observer at rest, substance in motion), and Michelson and Morley, all five of them have with one accord been vainly striving to show that the Earth is not at rest.

Unhappily: since 1905 this appraisal no longer presents a definite plus for the geocentric theory. Albert Einstein (1879-1955) came, saw, and conquered with his special theory of relativity. Declared that the physical laws are the same in all inertial frames of reference and that the speed of light in a vacuum is hence constant for all observers regardless of the motion of the source or observer. Then the controversial aspects that late nineteenth-century scientists had to wrestle with dissolve into thin air. As J. H. Poincaré (1854-1912) in 1904 already formulated it: the laws of physical phenomena are such that we do not have and cannot have any means of discovering whether or not we are carried along in a uniform motion of translation.(43) Or to

phrase Einstein's theoretical substructure for this principle of relativity popularly: to us it looks as if the Universe is geocentric, but of course it is not. The Lorentz transformations, quantifying "equal" contractions that are never directly observable but necessarily true, explain why this is the case. For one result of these transformations is "that the two velocities in coordinate systems that are in relative motion do not add according to the methods used in classical mechanics. For example, the resultant of two velocities in the same line is not their arithmetic sum".(44) Hushing up a few experimental results that do not fit too well in the Einsteinian-Lorentzian scheme,(45) this non-measurable but not to be doubted "fact" again allows us (and that now non-classically!) to give short shrift to any effort aiming at a geocentric explanation of Airy's failure. The velocity of the light traversing the water-filled telescope "as seen by the observer is changed by the fraction $1-1/n^2$... No assumption of any 'dragging' is involved in the relativity arguments, nor is the existence of an aether even postulated."(46) Glory be, but this only if Lorentz' *ipse dixit*, which *ipso facto* cannot be shown to be true, really is true!

Gladly and without any mental reservations I admit that the theory of special relativity wonderfully "saves the phenomena". A summary of its prowess by Panofski and Phillips(47) almost convinces any doubting Thomas who peruses the evidence. Yet such a Thomas shall do well to bethink himself twice before becoming a true believer. No question about it: if the STR is true then the logically understandable hierarchical and Earth-centered Universe of Antiquity and the Middle Ages was a pipe dream. The problem remains the "if" in the last

sentence. Time and theoretical thought do not stand still; the Special Theory, after eleven years of gestation, gave birth to the General Theory, a totally different kettle of fish. "Historians of future generations, therefore, will likely view the Special Theory more as a mark of stunning intellectual brilliance, which presaged the General Theory, rather than as a thing of value or permanence in itself. Hindsight now discloses it to be but one of four imposing and permanent steps into the new era. First was the problem with which such as Lorentz, Larmor, and Poincaré wrestled regarding covariant transformation between systems in relative motion when the instrumentation of experimental physics failed to record the expected factor of Earth velocity relative to interplanetary space... Fourth was Einstein's fascination in turn for Minkowski's geometric approach, followed by his determination to tackle the gravitational problems in similar manner' involving acceleration and non-Euclidian geometry in place of the flat space and constant velocity of the Special Theory, with the resulting General Theory. Among these four, only the climactic fourth is essential to Einstein's historical position in relativistic physics, the Special Theory being but one of the preliminary steps... No more value need therefore attach to the permanence of the Special Theory than to the discarded models of Lorentz and others, which preceded it."(48)

It seems to me that the author of this quote, Dr. Carl A. Zapffe, though bent on pleading his own cause, with these remarks may well be skirting a more promising approach in astrophysics. With regard to the General Theory as such: suppose the facile analogy of space as the frictionless surface of an expanding balloon,

with all celestial bodies whirling around on it, to have value. Then Russell's metaphysical dilemma still stands. Einstein, in a haughty illusion "observing" the Universe from a transcendental observatory, only immaterially existing inside his skull, prophecies that if we will just join him there "on high" we shall see how there is nowhere a hold on the curved Heaven. Yet what if there really is an Almighty God looking at His creation from a nth dimension, and revealing in His Message to mankind that He has on this "balloon" established the Earth in such a way that it cannot be moved?... Who of us here below can do more than believe the one or the Other?

In the present context I am satisfied with the undeniable actuality that though the STR presumably allowed the astronomers to escape from a geocentric bugbear - and a daunting argument from design behind it! - the GTR has been compelled to declare the Earth-centered model "as good as anybody else's, but not better".(49)

There are, however, for a skeptic wary of buying a pig in a poke, a few reflections that will cause him to take Einstein's cure-all for the problems, sketchily paraded in the foregoing, with a little less than total conviction.

Non-Observables Prove Nothing

First of all, and again: both of Einstein's theories assume as "proven" that which is not "proven": an Earth orbiting the Sun. But since, I must expect, all those who read this sentence have with him been conditioned to believe that assumption as gospel truth, for them this argument falls to the ground.

A second consideration possibly carries more weight. Metaphysics deals with unobservables, physics with observables. Accept Einstein's "sacred cow within a sacred cow",⁽⁵⁰⁾ the absolute velocity of light, that is. Furthermore take for granted that the Earth rotates and orbits a Sun, which is, as a nondescript member of the Milky Way, with this Way revolving relative to the aggregate of galaxies further out. Then the exigencies of applied physics and ineluctable logic force us to conclude that radiation reaching us from different directions will here on Earth be clocked at different velocities. This is not the case, and hence there must be a reason why. However that reason, actually Poincaré's "principle", is - allow me to repeat the sobering phrase - unobservable except through the very phenomenon it is invented to explain. To introduce Maxwell's notorious demon: if I account for the awkward Ptolemaic appearances by postulating legions of little gremlins adjusting the velocity of incoming light to the sacrosanct standard value c , then this preposterous theory and the foundational assumption of the reigning relativity share, ontologically judged, the same nugatory status. To wit: both want us to accept an explanation that by clear-headed science should be eschewed as worthless fantasy. A logician might even point out that equating Maxwell's demons with the mysterious capability of Poincaré's "principle" is not fair to those little nosee'ums. They are, after all, logically possible and hence admissible. For *homo sapiens*, who in his thinking, and doing, and research refuses to brush off the strictures of logic and the laws of mathematics, it is not easy to accept that relativity. It needs a wrenching of the mind "understandingly" to acknowledge that, though the

Doppler effects are the same for sound waves and light waves, an observer "at rest" in the trajectory of a light ray, and all observers, relative to him moving with whatever speeds along that trajectory, yet will clock that ray's velocity relative to them at the constant velocity c . As science teachers know: when students for the first time are introduced to the special theory of relativity it is not the dullards in the class who initially are often unwilling to reconcile themselves to it. Until, of course, they begin to realize that a refusal logically constrains them to part with Copernicus' system. Which system, thanks to Galileo and his apostles, they have been brainwashed to deem "obvious". And therefore seeing no other way out of the dilemma, no other acceptable possibility in sight, they close their eyes and swallow what in their heart of hearts they know to be impossible, but gradually and under persistent peer pressure are converted into believing as scientific and self-evidently true truth.

Einstein himself, for that purpose designating logic as "common sense" once gave short shrift to the whole matter. Objections against his theory, he proclaimed, result from "a deposit of prejudice laid down in the mind prior to age of eighteen".(51) I know that I am banging my head against a wall, against a conviction pretty much ineradicably engraved on mankind's mind. Yet I cannot withhold myself from hoisting all relativists with their own petard by asking them whether their unshakable faith in Galileo's gospel is not just as well such a deposit. In Einstein's 1905 paper he considers relativity for first order magnitudes "already proven".(52) But where is that proof or anything approaching it? I have been searching for those for

twenty years and have found only syllogistically unsound demonstrations, untestable and therefore questionable *ad hoc*s, circular reasoning, and Newton's laws, acknowledged not to be equal to the task of proving Copernicus when higher powers of the eccentricities of the planetary orbits are counted in.

Yes, I know: Einstein's relativity explains to Copernicus' disciples so many otherwise baffling physical phenomena. I shall be the last to deny it, or to question the table of experimental bases(47) "confirming" it mentioned earlier in this essay. If we accept Copernicus there is no way around it. The wearying trouble is that "if". Why do we have to side with him and Galileo, and on whose orders? Why do we remain unwilling level-headedly to realize that a fully, as well as any semi-geocentric, model will explain these phenomena just as cogently and should be added to the theories in that table just mentioned as relativity's equals on any score? And then that hackneyed combination of Einstein and the " $E = mc^2$ ", endlessly bandied about in popular-scientific Western folklore! True, it can be deduced from the theory, but it does not prove STR, and does not depend on it, as Einstein himself has admitted. That formula has been derived in at least three non-relativistic ways,(53) and abandonment of STR will leave that Bomb-equation unharmed. Even in a vague manner to think that somehow Hiroshima in a most horrible way has confirmed the theory to be right is unwarranted. And *modus ponendo ponens* "proofs" may try to buttress its supposed veracity - in the nature of the case the logically necessary verification will be hard to come by.

The Unfailing Import of Airy's Failure

Like everybody else I was of course, from my tender youth on, imprinted with pictures of an Earth going around the Sun and with assurances about countless galaxies of similar great lights far away. But in my adolescent years, after a long time of dodging the haunting issue and postponing a decision, I "somehow" was compelled to realize that among all messages claiming to possess the truly transcendent answers to the "Whence, why, whither?" of our being only the Bible had a convincing, that is a fully immanent, systematic comprehension surpassing, ring of truth. That Jesus - and His good news of God's eternal Kingdom to come -verily is the way, the truth, and the life I dared no longer deny.

Perusing and studying Holy Writ confronted me, however, with problems still requiring choices in relation to creation. That evolution *a la* Darwin is a piece of preposterous fiction I was already assured of in my willfully agnostic years. Nobody ever needed to tell me that behind the scene a mysterious active Intelligence had to be pulling the wires and calling the tune. Dead dust or something called "Nature", somehow endowed with impersonal but pan-scientific expertise, "designing" and "adapting" countless forms of life and transmitting by means of sperm and egg intricate patterns from mortal generation to mortal generation - I never saw, nor see, how a level-headed observer could, or can, accept such arrant nonsense. Still, under the sway of the prevailing varieties of theistic evolution in the country of my birth, the Netherlands, I began my personal pilgrim's progress. But reading and rereading

Genesis in the context of the whole of Scripture I became more and more uneasy about glibly approving the manner in which even orthodox theologians manhandled the first eleven chapters of the sacred text to make it fit with the "facts" of science. That is, by treating the story as literal history from Abraham on, but declaring God's revelation about our present world's origins to be expressed in a sort of non-factual mood. For try as I might: at no point in the Biblical story-flow could I find the slightest indication of a change from poetic or mythical propensity into matter-of-fact history. Which made me conclude that for me the only way of faithfully and reverently doing justice to its informative content was to take the Genesis account literally. And becoming aware, after my emigration to Canada, of the resurgence of such an old-fashioned view on the subject, I eagerly jumped on the Creation Society bandwagon of Drs. Lammerts, Morris, *et al.*

Thinking, however, allows few standstills. Gradually it dawned on me that these brethren are still halting between two opinions. Rejecting secular scientific theories about the origins of life on Earth, they still go along with those about our habitat's position in the cosmos. For apart from the trio of astronomers publishing their geocentric views in the *Bulletin of the Tychonian Society*, I still have to find one all-out creationist who takes Genesis 1:1-19, minus the verse 11,12 and 13, just as straight-forwardly as Genesis 1:20-31. But sauce for the goose is sauce for the gander: he who accepts instantaneous *fiat* creation of our planet's flora and fauna has with regard to cosmogony thereby committed himself to a beginning of a Heaven containing nothing but a primeval Earth. Which Earth only after being

proclaimed fit for plant life and having brought forth grass and herbs and trees, on the fourth day of the Hexaemeron found itself surrounded by Sun, Moon and stars for signs and seasons, days and years. Popularly formulated: a Bible-believing Christian cosmogony must reject a Big Bang now having resulted in countless Suns, millions of them possibly surrounded by a set of aggregates of matter, on many of which through aeons of time, life may well have evolved. Contrariwise it has to postulate sudden emergence of, to quote Hoyle, "the bubble in which we live", and a dump of matter without form providing after five days of formation the dust out of which we are fashioned. Vexed by this exegetical inconsistency with regard to the sacred text I felt myself driven to examine the solidity of the evidence on which present day astronomers erect their multiform models. And found - to cut a long story short - that the old, in Scripture assumed as self-evident, and until Galileo never widely or seriously doubted geocentric view of the world *has never been disproven*. Not only that: without exception all historians, secular as well as sacred, whom I consulted about the impact of Canon Koppernigk's heliocentric turnabout on mankind's *Weltanschauung* stressed its far reaching consequences. To quote one comment on the widespread effect of Darwin's *Origin of Species* summarizing the whole matter: "The theory of natural selection brought home as nothing else could do the radical change in man's status in the Universe and made dramatically clear the attack on old values that had actually been implicit in the whole scientific development beginning in the sixteenth century."(54)

Granted: whether modern man is, or is not, more than the still flawed product of a mega-evolutionary

guided, or unguided, process is therewithal neither answered, nor settled. By what is called "natural light" and by the logic under the aegis of which man is compelled to think - at his impartial best he has to judge the contest between Creation and Evolution an insurmountable draw To turn the clock back either six thousand or six billion years is impossible. With regard to geology, fossilization, and biology it is therefore still each according to his acquired taste. If a transcendental Intelligent Force at some moment in time past called all being into being, we shall see the world of life we see. If the Darwinians, now by the scant supply of data pressed to posit a punctuated equilibrium, have hit the nail on the head we shall see the same, yet still supposedly evolving. Only with regards to the specifics assumed to have happened before the first amino acids arranged themselves in the murky soup-seas of the pristine Earth are we Anno Domini 1988 in a position to ask something sober-scientifically. To wit: is an Earth around which the Heavens revolve a superstitious fancy or a hard fact? Prior to Galileo's 1533 condemnation by the Church of Rome the latter view was taken for granted. From then on until 1916 the former one was imprinted on thinkers and non-thinkers alike. But after Einstein in that year burst for the second time upon the scene the tables were turned again: the geocentric model of the Universe, be it absolutely unacceptable, science cannot show to be wrong.

If this were all that can be said regarding the observable outcome of the world's developmental history from the at the moment theoretically fashionable Big Bang until the emergence of the biosphere on our planet among planets, then debates about the origin of

life as well as about the structure of the cosmos are doomed to remain forever rationally undecided. And the present essay, I am fully aware of that, will be at best a voice crying in the wilderness, only convincing the already convinced. For theoretical thinking and concluding are not self-sufficient. When - as it has happened! - a prominent astronomer tells us that scientifically the Tychonian system of the world cannot be disproven, but that philosophically it is unacceptable, then he bares thereby the pre-rational foundation of all human thought to be the starting point of his convictions. And that starting point determines his approach to his scientific labours, whether he is fully aware of it or not. For his theoretical thinking does not lead him to his philosophical judgment, but his faith in human thinking's self-sufficiency misleads him into believing that this thinking can provide him with an unassailable truth. Which is an inference manifestly too feeble to build a world view on. "For" - to quote the Dutch philosopher Herman Dooyeweerd - "if all philosophical currents that claim to choose their standpoint in theoretical thought alone, actually had no deeper presuppositions, it would be possible to convince an opponent of his error in a purely theoretical way. But as a matter of fact, a Thomist has never succeeded by purely theoretical arguments in convincing a Kantian or a positivist of the tenability of a theoretical metaphysics".(55) Only castles in the air need no foundation. Everything else has to start from and to build on something, on a belief beyond reason taken to be self-evident "because...". At bottom the clash is not between scientific theories, but between pseudocertainties conceived in mortal minds and - those minds

will claim - trumped-up stories about ghosts in the world machine. On the one side we have a faith shored up by deductions drawn from dumb data, which data during the sciences' development have often been manhandled to fit the Procrustus bed of a ruling paradigm. Confronting that faith is any believer's firm conviction that mortal man cannot by his own bootstraps hoist himself above time and space, but needs for origins, and for all knowledge, an Originator, Whose self-authenticating information he has to accept on trust and is unable to verify. That the Bible, and not Hesiod's *Theogony*, Mahomat's *Koran*, the *Vedanta*, the *Eddas*, or any other revelation from Above, provides us with such axiomatic "gnosis" is hence a statement beyond any rational argument, but a case of "believe it or not".

And nobody can do more than decide what to believe - whatever the wind or the whim prompting him or her. To prevent an opponent from attacking a straw man of his own making, and to make assurance doubly sure: in no way do I want to demean the Bible by using it as a scientific textbook. As history trustworthy, yes. However Joshua's "Sun, stand thou still!" and suchlike utterances I do not come out with. I might as well "prove" relativity with the statement in the story of St. Paul's shipwreck that the sailors supposed some land "coming near to them". If this were all that could be said...but it is not! For Einstein, I hold, is wrong. Neither the special, nor the general theory of relativity are sound sublunary and on that account sound sober-scientific constructs. With an appropriate apology I quote for a third time the *New Scientist's* characterization of Sir Fred Hoyle's trespass into the realm of metaphysics: Einstein has "betrayed the very standards on which the scientific

community has been built".(11) And a question "of the most extreme simplicity", on which a backslidden true believer in relativity, the late Herbert Dingle, not even after thirteen years of asking it got a straightforward answer, demonstrates that effectively with regard to the special theory.

"According to the theory, if you have two exactly similar clocks, A and B, and one is moving with respect to the other, they must work at different rates, *i.e.* one works more slowly than the other. But the theory also requires that you cannot distinguish which clock is the 'moving' one; it is equally true to say that A rests while B moves and that B rests while A moves. The question therefore arises: how does one determine consistently with the theory, which clock works more slowly? Unless this question is answerable, the theory unavoidably requires that A works more slowly than B and B more slowly than A - which it requires no super-intelligence to see is impossible. Now, clearly, a theory that requires an impossibility cannot be true, and scientific integrity requires, therefore, either that the question just posed shall be answered, or else that the theory shall be acknowledged to be false. But, as I have said, more than thirteen years of continuous effort have failed to produce either response. The question is left by the experimenters to the mathematical specialists, who either ignore it or shroud it in various obscurities, while experiments involving enormous physical risk go on being performed.

It cannot be too strongly emphasized that this question is exactly what it appears to be, with every word and phrase bearing its ordinary, generally understood, meaning; it is not a profoundly complicated

question, artificially simplified to bring it within the scope of the non-scientific reader's intelligence. It is presented here in its full scientific reality, and the ordinary reader is as fully competent to understand whether a proffered answer is in fact an answer or an evasion as is the most learned physicist or mathematician".(56)

I submit that there is a very basic reason why on this question no straight answers have been forthcoming: the "riddle" simply cannot be solved on the scientific plane. And I sometimes ask myself whether maybe the sharp minds to which Dingle addressed his query were not instinctively aware of this and therefore, evading the issue, have been confining themselves to circumlocutions missing the mark. He who takes the *Armstrong Alert* and *Russell's Reminder* to heart will realize this possibility. An observer "here below", supposedly with no hold on the void around his home in the Heavens, is on that account at a loss. He may see the distance between the two clocks increasing, but try as he might he cannot measure the motion or rest of either of them absolutely. Poincare's "principle of relativity" denies the possibility of doing this.

However, suppose we promote that observer to the post of bystander, the one rashly assumed by Gardner to authenticate the Twin Paradox, as outlined earlier. Then Dingle's question is easily answered. The clock moving with respect to the starry dome may slow down, the one at rest relative to the Universe as a whole will not. Alas: such a promotion is not feasible. For it requires that a bystander at rest "outside" the Universe assures us that our observer is also a bystander absolutely at rest "inside" the cosmos and not influenced

by its motion. In short: the best Dingle's detractors can do is to obfuscate the affair and to fob him off with a Jekyll-and-Hyde device. And it is to their credit that all of them in their answer-no-answer game have shied away from the mortal sin of mixing metaphysics and orthophysics. Martin Gardner excepted, that is!

The Heart of the Matter

There is one consideration and there is an experimental proposal capable of testing its validity, which strongly argues against the dictum that space knows no place and movement no rest. General Relativity ruling the roost, the up-to-date astrophysical confession assures us that whatever celestial body we prefer to suppose as being at Heaven's centre will make no difference in the overall theoretical structure deducible from it. The cosmological conclusions derived from the observable phenomena will be the same whether we select Sirius, the Sun, or Earth as the solid point of departure for our thinking and conclusions about the cosmic building code.

I disagree. The extrapolations originating from an Earth taken to be at rest in space and those following from, e.g. a Sun for practical purposes assumed to occupy such a preferred place - they are totally discordant. The stargazer who takes his first clue from Copernicus will, historically tracing his way via Giordano Bruno, Thomas Digges, Newton, Mach, Lorentz, and Einstein, end up with one of the many cosmological models and cosmological scenarios today the vogue. On the other hand: the astronomer who begins to investigate the corollaries and consequences of

Tycho Brahe's geocentric view is in for a nasty shock when visualizing the emerging features of this model in classical, three-dimensional "flat" space, the only space in which mankind non-analogically can visualize anything!

Allow me to explain why the geocentric explanation of Airy's failure, never yet convincingly banished, because not demonstrably falsifiable, leads from one thing to another.

To begin with: the theoretical status of the Earth-centered concept is today under Einstein's regimen higher than it has ever been since the 1687 publication of Newton's *Principia*, the ruling model now "giving increased respectability to the geocentric picture".(57) For the Ptolemaic and the Copernican view "when improved by adding terms involving the square and higher powers of the eccentricities of the planetary orbits, are physically equivalent to one another".(58) The Tychonian system "is in reality absolutely identical with the system of Copernicus and all computations of the places of the planets are the same for the two systems".(59) Not only that: in calculating those planets' perturbations, "the mathematician is forced to adopt the old device of Hipparchus and Ptolemy, the discredited and discarded epicycle. It is true that the name, epicycle, is no longer used, and that one may hunt in vain through astronomical textbooks for the slightest hint of the present day use of the device, which in the popular mind is connected with absurd and fantastic theories. The physicist and the mathematician now speak of 'harmonic motion', of Fourier's series, of the development of a function into a series of sines and cosines. The name has been changed, but the essentials

of the device remain. And the essential, the fundamental point of the device, under whatever name it may be concealed, is the representation of an irregular motion as the combination of a number of simple, uniform, circular motions."(60) Laying out the course for, e.g., that rendezvous between the Giotto satellite and Halley's comet would have embroiled those old Greek savants in a geometric nightmare. It would have cost Karl Friedrich Gauss (1777-1855) still hours and hours of laborious cyphering to obtain all the necessary data, which the batteries of computers in a modern space center now spit out in a split second. In fact, however, there is only one basic ontological difference between the mathematical procedures applied before Copernicus and those used after Newton. In the days of yore the Earth was at rest in space; in A.D.1988, whether the practitioners of the art of celestial kinematics like it or not, their home in the heavens must be supposed to be at rest.

There are, however, troublesome particulars, which should not be overlooked. Bertrand Russell's contention that the observable phenomena will be the same whether the Earth rotates or the Heavens revolve, as well as Fred Hoyle's declaration that the geocentric view is as good as anybody else's, but not better, they are only tenable if certain presuppositions are assumed to be self-evident. Which they are not! For it is certainly not self-evident that the Earth is in motion relative to the space surrounding it.

Russell's view takes for granted a space pinpointing places and hence allowing motion through that space to be real, though apparently not directly but only relatively observable. Any drawing of the Universe

with the Sun in the center of the Solar System (see figure 4) will show us this. For simplicity's sake I propose that we disregard both Mother Gea's diurnal rotation against the background of the stars taken to be at rest, and the four-minute complication caused by the difference between a solar and a sidereal day. They do not impinge on the argument as such. Now with a pencil, its tip representing our planet, we trace the Earth's orbit around the Sun.

Stellar aberration, parallaxes and the Great Light's annual travel along the Zodiac – they are lucidly and Copernically demonstrated. Next we keep, relative to ourselves, the pencil in place with the orbit it has been describing sliding underneath it, and let the Sun circle the

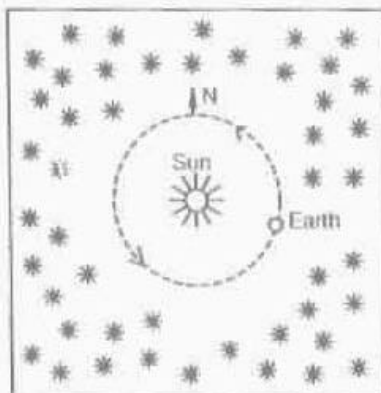


Figure 4

Earth. This now by moving the paper (that is, the Universe) around, without changing the direction of the N arrow with regard to ourselves.

For "observers" situated down there at the point of the pencil, "inside" all perceptible being, nothing has changed. Only we, by comparison "bystanders", haughtily overestimating ourselves, "see" whether we have held either the Sun or the Earth at rest. For the mortals we have created in this way, inhabiting a space with one dimension less than the one in which we find ourselves, the issue is metaphysical and the question

unanswerable. If we tell them what viewed from a dimension superseding theirs is "really" the case, they can accept or reject our words but not verify them. *Mutatis mutandis*, with regard to any and all foundational information about how the cosmos around us came into being, is arranged now, and shall appear theoretically thinkable billions of years in the future, we clearly have, to quote St. Paul in his second letter to the Corinthians, to walk by faith, not by sight. Faith in transcendental information or faith in the truth of our own minds' constructs, which constructs history shows to be like grass that today is and tomorrow is cast into the oven. Trusting, as I do, the self-authenticating Divine Message of Holy Writ I feel therefore enjoined to prefer Tycho Brahe's system of the world above the everchanging confabulations of post-Galilean astronomy. Confabulations now, after Einstein, becoming so far-fetched that I cannot help but agree with W.R. Corliss: "As the structures of the cosmos and the subatomic world become more and more foreign to everyday experience, we have to ask whether such bizarre constructions may not be the consequence of incorrect physical theories, such as Relativity, the Big Bang hypothesis, and so on". Courageous words, to which he in his newest book adds support by means of an impressive collection of anomalies that are troubling theorists, but are seldom rightly given their due by the populizers of the Universe we are expected to believe in.(61)

Be this as it may, there is one result of these "free creations of the human mind", to borrow a phrase from Einstein⁽⁶²⁾ that concerns us here from the first to the last sentence. To wit: Sir Fred Hoyle's "as good as, but no

better". It is, in the light of the foregoing, not difficult to become aware how that assertion implies an unspoken conditional clause: "provided that Newton has been practically right about the mechanics of the Solar System, but the therefore real motion of the Earth is not straightforwardly observable, a curious but undeniable fact, successively explained by Fresnel, by Stokes, by Lorentz, and now completely and finally by Einstein's cure-all". To quote the latter great man himself: "According to the general theory of relativity space is endowed with physical qualities; in this sense, therefore, there exists an ether. According to the general theory of relativity space without ether is unthinkable; for in such space there would not only be no propagation of light, but also no possibility of existence for standards of space and time (measuring rods and clocks), nor therefore any space-time intervals in the physical sense. But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time. The idea of motion may not be applied to it."(63) Or, as Martin Gardner puts it: "Indeed from the standpoint of relativity the choice of reference frame is arbitrary. Naturally, it is simpler to assume the universe is fixed and the Earth moving than the other way around, but the two ways of talking about the Earth's relative motion are two ways of saying the same thing."(64) For him: yes, but also for an "outside observer"?

Well, simpler is not always better, Occam's razor notwithstanding. Many things dubbed at first sight simple appear, more closely scrutinized, to be complex. Newton's solid atomic pellets have now been dissolved into quirky particles and his kinematics, for low

velocities still approved by Einstein, may - who knows? be influenced by the starry dome above us in a Machian manner not yet generally acknowledged or fully understood!

Before continuing the argument I first, however, have to dispose of a red herring. A third apparent possibility, moving the "Flatland Universe" around the pencil point, representing our globe at rest relative to us, does not work - it is an untenable model. For then, viewed by Earthlings, the Sun will remain in the constellation of the Zodiac that it occupied when we began to shift the paper.

Testing Einstein! Why? He Can't be Wrong!**Some Desiderata Not to be Overlooked**

From the foregoing it will have become clear that the reigning relativity can indeed not pillory an Earth-centered cosmology. Accepting the second elucidation - the pencil at rest - of the data observable "inside" the Universe, I can stick to my geocentric guns. If Einstein is right the Tychoian quest amounts simply to forcing an open door. But therefore not yet to a much ado about nothing! Its knights-errant may then rightfully insist on a theoretical Equal Rights Amendment. What is more - allow me to repeat it! - there is the undeniable circumstance that their consistent all-out creationist position, based as it is on faith void of proof, can only be attacked by a conviction based likewise on an act of faith forever void of proof. That a post-Christian society should in consequence take Tycho seriously is therefore, I am afraid, a pipe dream. Superstitions are out of fashion in the Age of a Science Revered as Religion, except the basic faith assumption of Copernicus and

Galileo. Only a demonstration that Einstein missed the mark may accomplish something. That is: something of indisputable value in the defense of at best a teleological world view. For that, in the present age, without God-given faith and without accepting the self-authentication of the Bible, mortal man can by reasoning progress beyond a "self-evident" Deism or non-specific theism I deem to be impossible. Only, to quote Pascal's well-known epigram, a heart having reasons that reason knows nothing of - and not suppressing those! - may yet long for a God, Who is Love. Seeking Him behind the relentless and unloving blind causality, which secular science must attribute to the present phenomenal world. And then find that God, because - again Pascal! - it would not seek Him if it had not found Him.(65)

And there, I readily admit, the matter will rest if Einstein is right..., but he is not! At least not yet! A plain experimental demonstration, as simple as Dingle's question for the Special Theory, may well put, I venture, the General Theory, as presently mathematized, outside the pale of responsible science. But before coming to that, first of all something that cannot be stressed enough: the whole Einsteinian enterprise rests on a logical fallacy. Consider: an Indian in the Amazonian jungle will never see snow and therefore declare that the white man's nonsense about such a cold stuff is just that: nonsense. And only a trip to the Antarctic will effectively undeceive him. Draw the obvious parallel: on our supposedly through space corkscrewing planet light reaches us from all directions at the standard speed c . But this does not prove that measurements on the Moon, or on any satellite in motion with respect to us here on Earth will also always give us that c . To extract from a

localized phenomenon a universal application is unwarranted. Before we shall be constrained to assert that we move but cannot prove this, at least one control experiment is necessary aboard a platform rapidly moving with regard to Earth-bound laboratories.

In the summer of 1982 three of us performed an experiment, later published in the "American Journal of Physics", that I have been asking for since 1968.* Our heavy apparatus, a modified version of the Rayleigh refractometer, equaled in simplicity of construction the set-up employed by Hoek in 1868, but had the advantage of applying a single unilateral laser beam instead of the from opposite directions returning two light rays, with which that Dutchman operated. Our instrument was able to detect changes in the velocity of light, measured relative to itself, down to about 14.4 m/sec, and further refinements would have resulted in a still greater sensitivity.

Needless to say: rotating this refractometer employed as an interferometer we drew a blank. Not the slightest fringe shift could be observed. The apparatus "stood still". (66)

A portable form of the heavy device was subsequently constructed by our technician, Mr. M. Sanderse. And the proposal we now put forward will be clear: with this light-weight instrument the isotropy postulate should be tested on a fast-moving object, such as an airplane, a satellite, or a space shuttle.

The data obtained by such a control experiment, even a child can realize this, will either at last put Poincare's and Einstein's principle of relativity on a firm footing, or otherwise utterly disavow it. Now true science, it is always loudly proclaimed, will not leave a

*See Addendum 1

stone unturned for a chance to disprove even its dearest theoretical deductions. And if there is one thing which amazes me then it is this that Einsteinians have not hurried to arrange such a trial as soon as it became feasible, but that - to name just a few - a Theocharis, a Zappfe, and my co-workers and myself remain voices clamouring in a wilderness of complacency and lack of even elementary logical insight. Yet on the other hand I understand this unwillingness all too well. The fall of the ruling paradigm will have such "unthinkable" consequences that for its adherents it is simply out of the question to envisage such a calamity. They cannot but beforehand declare it impossible that any test will ever topple their theorems, and therefore conclude that any effort aimed at disowning those would be a waste of time and money. However this prejudiced *a priori* "therefore" does not hold in the light of cold reason. Objectively appraised it represents an instance of ostrich policy, an act of willfully turning away from a contingency not wanted. For considering that contingency evokes the daunting spectre of the geostatic Universe evidenced by all solid and practical experiments ever performed. Scuttling their relativistic dogma will confine the reigning savants again, they realize, to the *cul-de-sac* out of which they by the grace of Einstein were delivered and compel them to re-think the "unthinkable".

Staggering indeed, I do not deny it, are the features of the model that emerges for an astronomy no longer able to apply the Lorentz Transformations. I even hesitate to catalogue those "unthinkable" integrants facing him, who bids Copernicus *et al* farewell - ten to one he will reject them out of hand. Yet I shall take the

risk of enumerating the consequences following the fall of relativity. After all: on patient paper to peruse these will harm nobody. It only may serve to show that Tychonians have reasons for their way of reasoning.

Before presenting these reasons I allow myself to give one example that in the accepted astrophysics things are not as solidly established as they popularly are presented to be. Distances to stars and galaxies of millions and billions of light years for instance – books, and articles and television programmes bombard us with those hard facts, but in truth they are arrived at by means of questionable procedures. Nobody – and nobody will deny this – has proven the Earth absolutely to be in motion with regard to the spatiality around us. Yet on the assertion that the semi-major axis of its elliptical orbit around the Sun has the in principle truly measurable length of 149.5 million kilometers, or about eight light minutes, everything else depends.

However, what cannot be helped we have to endure. The only thing left to me is to draw attention to an anti-relativistic indication that I deem to be fairly decisive.

Elementary geometry assures us that the triangles AS_1B and AS_2B (see figure 5) are determined if their angles at A and B and the length of the base AB are known. This Euclidean certainty is the first and the only firm step in the process by which modern

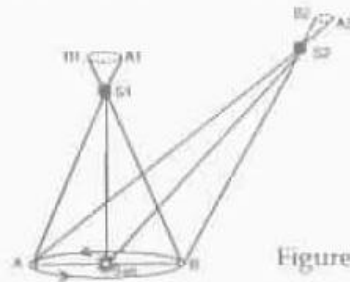


Figure 5

astronomy measures - its practitioners believe - the distance to even the furthest distant stars. (That quasars are now upsetting the applecart somewhat I pass by) Paring down the matter to its essentials, the procedure is the following. Since the Earth annually describes, they think, the ellipse AB around the Sun S, the comparatively near stars S_1 and S_2 are yearly tracing very small, for the unaided eye imperceptible ellipses against the background of the more distant stars. Telescopic observations of S_1 and S_2 from the Earth at A and six months later at B, combined with the known length of axis AB, determine hence the two triangles. Simple trigonometry provides us thereupon with the lengths of Sun - S_1 and Sun - S_2 , that is, with the distance to those stars. The angles at S_1 and S_2 are, of course, very small: even for the nearest star the total displacement is no more than about $1''.5$, and only for some 700 stars the parallaxes are large enough to be measured with acceptable accuracy. The distances to most of them must thus be found by other means, that is by less certain indirect and statistical methods. Which implies *modus ponendo ponens* deductions that are in the nature of things not verifiable "on the spot". Listing the more important of those methods the late George Abell uses in less than a page five times the adjective "apparent", three times the verb "to estimate", once the verbs "to infer" and "to assume", once the adjective "approximate", and last but not least the phrase "an intelligent guess".(67) I leave it to the reader to appraise the trustworthiness of such procedures, and to calculate the probability of the obtained results being correct. Sufficient is it to say that, Copernicus being right, according to direct measurement the nearest stars would be 4.3 light years away.

Yet... "We know now that the difference between a heliocentric and a geocentric theory is one of motions only, and that such a difference has no physical significance".(68) Referring the reader to the elementary geometric steps used in determining the distance to a star from a Sun-centered perspective, I hold that hence nobody can blame me for using the same steps in an Earth-centered model. Allow me for a few moments to return to that analogy of a super-scientific three-dimensional view on the two-dimensional "Flatland" paper Universe used in the foregoing. We - "bystanders" remember! - see the truth that the Earth-bound, viz. our pencil-bound observers, cannot see. And like Sir Fred Hoyle assures us, we may in our turn assure an imaginary Tychonian down there on the paper that his view is "as good as anyone else's - but no better". For, to quote Hoyle a second time: "Since the issue is one of relative motion only, there are infinitely many exactly equivalent descriptions referred to different centers - in principle any point will do, the Moon, Jupiter.. "(69)

Suppose that we want the Flatland Universe we have created with respect to us centered on the Martian moon Phobos. Then it will be more difficult to shuffle the paper accurately, but for an observer on Phobos nothing is different. Furthermore: if we change the analogy to the one of a frictionless expanding balloon representing the unbounded and yet finite curved space propagated by Einstein, then the same considerations hold. Only an "outsider" can "know" - "insiders" can only guess and believe or not believe what the "outsider" tells them.

Unhappily there is a fly in the ointment of such a relativistic treatment of the problem. Whatsoever member of the Solar System we select to be the System's

centre, that treatment requires this member to move relative to the spatiality around it. Or, if we prefer to say it the other way around: that spatiality must be taken to move relative to the member in question. Returning to the Earth under our own feet: for the accepted explanation of stellar aberration and parallax it is a *conditio sine qua non* that our home in the Heavens runs a near-circular track through space, in which space light travels in a straight line through an aether to which, according to Einstein, the idea of motion may not be applied.

Apart from the question how we shall understand these words; and leaving aside Stefan Marinov, *et al.*, and their "chopping" of radiation results about absolute velocities,(70) a fact is that not a single lateral motion of the Earth has been hard and fast experimentally demonstrated. Not only that: Einstein's theories predict that this is the case for all celestial bodies, whether natural or artificial, moving with respect to us here below. Observers on all of them will always measure the absolute speed of light c to be c , unless perhaps we travel to the stars in the far blue yonder.

Now suppose the control experiment here proposed to have been performed and to have proffered data effectively disqualifying the principle of relativity. That is to say: aboard an artificial body moving at v km/sec with regard to the surface of the Earth, the Sanderse interferometer did register a fringe shift compatible with an "aether drift" of this v km/sec. Hoyle's "as good as anyone else's, but no better", then will have to be rephrased as "not only better, but true" - a twist he may be loath to accept, yet will find difficult to refute. Referring the perplexed reader to the Flatland

Universe depicted on page 63: the aberration of starlight, in his a-centric model still caused by the relative orbital velocity of the Earth, must now, I agree with van der Waals, be ascribed to a motion of the stars. The astronomer on the Earth "at rest" in space has to accept a Sun running the race through space that Copernicus erroneously assigned to our abode. What is more: he sees the Moon monthly orbiting the Earth, and the planets obeying Newton's laws in their trajectories around the Sun. In short: he and we shall still observe the "facts" mankind always has observed.

For the votaries of Copernicus, I am aware, there is then still a way out: a semi-Copernican solution after the fashion of Stokes, nowadays championed by the Schesis Theories of Theo Theocharis and Carl A. Zappfe.(48) Whether their hypotheses can really be considered to be outlawed by Latham and Last's dismissal of a "tied" aether I must leave undecided.(71) I dare to hope against hope that the artificiality of those schemes will forestall their acceptance. An Easphere, rotating in a Heliosphere, carried along by a Galactosphere! Their model is, properly speaking, Copernicanism with a vengeance. That their Easphere is in motion they know only because everybody knows that the Earth is in motion, and they introduce that sphere to steal a march on Einstein, whose postulates they rightly consider unacceptable. United, however, they and I clamour for that long overdue space test. With them I will only be at loggerheads after our shared antirelativism shall have been vindicated. Not to mention many other anti-geocentric theorists, as, *e.g.*, Stefan Marinov in his *Eppur Si Muove*, and W. Krause, in proposing an intriguing Leibnizian "Eigenspace".(70)

So far, so good. Unhappily - or depending on one's point of view: happily - there is more that inevitably follows in this Tychonian scenario. And it will require a careful analysis just to make this "thinkable". For not to fence about the affair: if the Earth would be shown to be truly at rest in a - as it appears to us to be - by matter evoked or matter harbouring spatiality, then it may well reside at the centre of a finite Spherical Universe bounded by a huge shell of stars. Whether finally the Heavens around us diurnally rotate relative to the Earth or *vice versa* is, I agree with Bertrand Russell, a question that astronomy in the present age and stage of God's Great Plan cannot answer. I believe it is the Heavens, but any orthoscientific evidence for that conviction I do not have and cannot have.

Who, the reader will retort, is going to believe such nonsense? I do - at least until the control experiment I insist on will have produced a negative result, and I thereby am compelled to fall back on either Einstein's cosmic model or one of its Copernican rivals, evaluated as belief systems by the light of *Russell's Reminder* and the *Armstrong Alert*. That is to say: I shall still adhere to the conviction that for the Creator, and only Bystander in regard to all things seen by us, the Earth is the unmoved focus of spatiality. And be forced to admit that mankind in our time can only either believe or disbelieve this metaphysical truth.

It has, however, as already intimated, not yet come to such a fideist impasse. I may well be wrong, for in the last resort I only know that I am and *ergo* can think, but not much more. Yet nobody can rob me of the credential that according to the most hallowed scientific code of behaviour I also here have proposed a simple

experiment with which to prove me mistaken. For in my turn I unabashedly declare it nonsense without more ado to conclude that because on the Earth's surface we cannot measure motion in respect to spatiality, *therefore* we cannot measure this anywhere - the inference is logically null and void. From which follows firstly that until further notice the theory of relativity, as already argued, is no more than a far-fetched hypothesis sorely in need of extra-terrestrial confirmation, and secondly that the Tychonian theory, with all solid evidences favouring it, should at least be granted a hearing.

These evidences, *i.e.* the observational facts that in the present context play an indispensable role are aberration (from Latin "aberrare" - to diverge from a straight path) and parallax (from Greek "parallaxis" - mutual inclination of two lines forming an angle). Both have in the foregoing been referred to and explained, but in a geocentric Universe such a totally different interpretation applies to them that the term "aberration" becomes a misnomer.

Analogous to van der Waals' explanation of aberration used in the foregoing, the customary expedient employed in most textbooks is that of a man on a windless day walking in the rain and carrying a stove pipe. As long as he is standing still, holding the pipe vertically, the raindrops will fall straight through the length of the pipe. But if he starts walking he must tilt his crude apparatus slightly forward. Otherwise the drops entering the top will be swept up by the pipe and not emerge from the bottom end. Furthermore: the faster our man walks, the greater the necessary tilt. Also keep in mind the corollary: on a windy day the pipe will have to be tilted when the observer is standing still, and that

exactly to the same degree in respect to the wind speed as in the first case it had to be done in respect to his walking speed. Last of all: we can improve the quality of the analogy by using in it a tube of, *e.g.*, wire netting.

In the same manner, thus the reasoning goes, because of the Earth's orbital motion telescopes must be tilted forward, with the result that the direction in which we observe any star will be slightly displaced from its geometric position. And the velocity of light being about ten thousand times that of the Earth, a simple calculation will tell us what the angle of the tilt will be, accurately now 20"496. Or to say it otherwise: this angle of 20"496 is subtended by the semimajor axis of the tiny imaginary orbit in which we should see all stars circling in the source of a year. This is what the astronomers observe. *Q.E.D.*: the Earth goes around the Sun, and aberration is caused by our 30 km/sec velocity.

That we have an invalid *modus ponendo ponens* conclusion here, I have already demonstrated. Starting from Einstein's point of view we may even go further. It is twenty of the one or a score of the other whether we explain aberration by means of us moving relative to the stars, or the stars moving relative to us. Agreed - but what if we take the latter of these "either-or" models seriously?

The physical data then staring the astronomer in the face are, I agree, staggering. Seen from the ruling point of view, that is. However, should the theoretical context of "flat", *i.e.* three-dimensional space have to be reinstated in case Einstein's downfall will abolish his space-time continuum, then this "either-or" will fall with it. For then the logically and *ergo* kinematically binding *modus tollendo tollens* Boscovich reasoning compels us

to conclude that stellar aberration is caused by stellar motion. Unless - as already mentioned - we succeed in demolishing the disproofs for the existence of a "tied aether" and opt for the *ad hoc* of a spaces-orbiting-in-or-around-spaces scheme after the style of Stokes and his present-day followers.

The Discarded Image Vindicated - Experimentally

Though, sadly enough, it has not yet much influenced the understanding of lay people, the rank and file of common college professors in general, and temporizing theologians in particular - the relation between science and truth is no more what, until about the Second World War, it since Newton was accepted to be. Truly perceptive thinkers, at long last coming to their senses and recognizing the fatuity of a "we now know", slowly begin to attract a following. Slowly, for even among those who profess to admire the literature published by these harbingers of a better era in humanity's travel through time, today only a minority have already become fully aware of this new view's far-reaching impact. And this, I am inclined to think, because the sense of awe that modern technological accomplishments are wont to make us look at these accomplishments as products of theoretical science - which in the commonly accepted sense of the term they are not. These marvels result from trial and error tinkering, not from questioning - just read a biography of Edison.

Canny inventors may devise machinery capable of shooting men to the Moon and may fabricate

microscopic tools for gene splicing, but this does not mean that therefore and thereby they can answer mankind's greatest and deepest questions - those remain as elusive as before. Returning to the subject concerning us here: with regard to presenting us with truth in theoretical cosmology, technology is powerless. Mighty telescopes and super-sensitive scanners may deliver reams and reams of data - they deliver not a syllable of unassailable interpretation. At bottom we always see, as Wittgenstein put it, what we want to see. That is in astronomy: either a closed finite, an open infinite, or a curved unbounded cosmos. "Today", thus James Burke, "we live according to the latest version of how the universe functions. This view affects our behaviour and thought, just as previous versions affected those who lived with them...Like our ancestors we know the real truth". And pondering the implications of the many shifts of view history presents us with he asks: "Do scientific criteria change with changing social priorities? If they do, why is science accorded its privileged position? If all research is theory-laden, contextually determined, is knowledge merely what we decided it should be? Is the universe what we discover it is, or what we say it is?"(72)

In the same vein C.S. Lewis remarks: "The nineteenth century still held the belief that by inferences from our sense-experience (improved by instruments) we could 'know' the ultimate physical reality more or less as, by maps, pictures, and travel books a man can 'know' a country he has not visited; and that in both cases the 'truth' would be a sort of mental replica of the thing itself. Philosophers might have disquieting comments to make on this conception; but scientists and plain men did not much attend to them."

No, they did not, but today they begin to do it. "We are all", Lewis adds, "very properly, familiar with the idea that in every age the human mind is deeply influenced by the accepted model of the universe. But there is a two-way traffic; the model is also influenced by the prevailing temper of mind... Hardly any battery of new facts could have persuaded a Greek that the universe had an attribute so repugnant to him as infinity; hardly any such battery could persuade a modern that it is hierarchical "(73)

I am aware: the temper of modern man's mind I still have against me. On the other hand the modest approach of the rising philosophy of science gives me the courage to speak my mind freely. Against all comers I therefore declare that I side with Lewis' Greek. I hold that the finite Universe is hierarchical, ascending from man on the Earth below to the Heaven of God Almighty above the stars. However, before placing my battery of facts in position I have to prepare the ground for doing this.

Pertinent to the importance of the right understanding of aberration: there has been more at stake with regard to its influence on the further development, and thereupon the demise, of Copernican astronomy than at first sight will meet the eye. That the publication of Newton's *Principia* caused Tycho Brahe to be driven into oblivion cannot be denied; but forty years later Bradley appears to have silenced almost without exception even the few percipient souls who cannot but have agreed, with Berkeley over against the great Isaac, that only in a space knowing place, and in it the fixed stars at rest, the notion of an Earth orbiting a Sun has any real, unequivocal meaning. For aberration, as it is

presently preached, requires an Earth at a "real" velocity of 30 km/sec describing an ellipse through space with a Sun resting in one of its foci. A Sun in motion, carrying our Kepler's and Newton's laws abiding planet along, would cause that aberration to be inconstant and revealing the Sun's speed at the moments of its maximum and minimum size. Therefore it is not difficult to see that even these Berkeleyan doubters - reluctantly I suppose - began to go along with what everybody of name knew to be true. To attribute the phenomenon to a synchronous and simultaneous motion of all the fixed stars was out of the question. It would have involved a retrogress of astronomy to hoary Ptolemaic antiquity and to Kepler's long already abandoned *Stellatum*, that is: a shell of stars enclosing a finite Universe. It is accordingly understandable that no one judged a further conformation, as proposed by Boscovich, still necessary.

Yet already a decade before Bradley died the speculations of a Thomas Wright, about the Milky Way possible being a lens-shaped stellar system, commenced to set in motion a train of thought that, though inhering the Newtonian view of spatiality, would make havoc of mankind's still lingering parochial outlook with respect to our place in the totality of the visible cosmos.

Via, among many others, Herschel, Laplace, Kant, Doppler, and Kapteyn, the consequences drawn from the denial of a *Stellatum* have led modern astronomers to accept a theoretical stance, which convinces them that they "know" how we together with the Sun circle the centre of the Milky Way. We do that with a velocity of *circa* 250 km/sec., while in the meantime our galaxy and its neighbouring stellar swarms may well hurtle at 600 km/sec towards the Virgo cluster of star systems. Of

course these supervelocities cannot in any way be directly determined, and do not expect aberration to reveal them. The fixed stars around us move along with us at distances of many light years; and the countless galaxies that expand space by rushing away from us and each other, or if you prefer, are outward bound in that space - the experts express themselves not too clearly on this point... those galaxies are so far away that centuries will have to pass before we shall perceive sizable changes in positions. There is with respect to aberration here even a fitting parallel with Fresnel's aether drift: we are unable to observe the aberration caused by those galactic whirls and swirls; only the change in it resulting from our going around our local Great Light the telescopes show us. Now it is beyond dispute: unobservables *may* exist, but do not *have* to exist. From which follows that when all is said and done there may be nothing beyond and above Bradley's miniscule angle. And if we take the Einstein solution seriously, holding that under its aegis the geocentric theory according to Hoyle is "as good as anyone else's - but no better", then we are, I posit, saddled with a perplexing quandary, which quandary - as I have already hinted at - Sir Fred will simply have overlooked as irrelevant for a Universe ruled by relativity. His adage, even a child can see this, surely holds for a Solar System adrift in a space that knows no place, and no handhold on the Heavens. However, his space-time continuum is a mental construct of which, without as well as with the help of the most elaborate instruments, his senses and those of all men can only observe and apprehend the three dimensions of the everyday world. A world, and we may do well to realize this, that allows us to fly to the Moon and to land

instruments on Mars. And out of which we only at all costs must try to escape into "unthinkable" curved space, if we do not want to live in the geocentric Universe that all down-to-earth tests urge us to accept.

The triangulation of space, on which this today generally accepted vista rests, starts from a base line that no experiment can soundly show to be there. The "proofs" for its existence are too rashly drawn from a no-win situation. Under the constraints of classical science this base line is the diameter of the ellipse that the Earth at a velocity of 30 km/sec describes around the Sun. Alas - that velocity cannot in any way be directly demonstrated. One of its derivations, here the length of said base line necessary to determine by means of parallaxes the distances to the nearest stars, remains open to questions. And that the same must be said about the card castle of extrapolations brought into play after ignoring this weakness, I have already laid bare.

Brushing these uncertainties aside by means of the principle of relativity introduces only another dubiety. We may be able in many ways to measure our average distance from the Sun to everyone's satisfaction - whether that 149.5 times 10^6 km radius has been measured from the focus of either Earth or Sun, or results from these two bodies circling a common centre, Einstein cannot tell us. Any conclusion as to that is as good as anyone else's - but no better. Again it is the momentous "Believe it, or not" - that verisimilitude of respectability beyond which the oldest and yet newest philosophy of science does not permit us to proceed on the way to truly true truth.

The selfsame ambiguity confronts us with respect to aberration. Neither classically, nor relatively, does the

phenomenon allow an astronomer to make a logically defensible choice between an Earth-caused or star-caused answer. But in case Einsteinian relativity will be found wanting, aberration becomes the trump-card in the neo-Tychonian game, restoring the *Stellatum* of old.

Suffer me - and this in the space and time beyond which mankind cannot measure motion or rest - to defend this assertion, unheard of since Kepler and more than a century ago so clearly suggested again by Airy's failure to confirm Copernicus.

The first step in tackling the issue evenhandedly is to keep in mind *Russell's Reminder* and the *Armstrong Alert*. For *if* there is a supernatural Bystander, for Whom the Heavens and the Earth on which we find ourselves are the first objects that He called into being and *if* since then He has constrained these by laws under which according to His will they operate - then He has the last word. And whether we, immanent observers and no more, have our options about the Universe right or wrong, only He knows. The question before all questions is in that case: does He share some of that knowledge with us, or does He leave us completely in the dark?

If our Universe is all there is, and if there are no higher orders of existence, then the positivists are right in crying foul when "rumours of transcendence in physics".(4) will begin to be seriously considered.

My position I have made clear. Even on the natural level God has let mankind know enough to leave them without excuse. And His message, conveyed to us in the pre-scientific, simply describing terms of Genesis One, I accept without any reservation. That message intimates the pre-eminence of the Earth as self-evident.

Therefore our habitat is not a typical by-product of a by chance progressing cosmic mega-evolution, but the intricate multiform artifact, for the sake of which all other material objects in Heaven's wide expanse are assigned their specific signal functions. The natural world hence must be "rightly viewed as the backdrop for the world of men and women".(74)

On his own, as an observer of the world around him, a man surely can, but does not have to, doubt the truth of what he sees and feels. However, by accepting a metaphysical communication, which in no way can be tested by us on its truth content, any doubt about this content is for me out of the question. Backed up by the highest authority thinkable I declare the Earth to be the firm centre of creation and not a negligible globule-among-globules whirling through space. And I hold that unbiased research will demonstrate that conclusion inescapable. Newton, accordingly, will be shown at bottom to have been right. Space knows place and movement rest. In defining that space as God's sensorium he went too far, and his efforts to demonstrate absolute motion by means of a rotating water-filled bucket Berkeley showed to be unconvincing. Yet both men believed in a Creator and Heavenly Father, whose existence they, be it unwittingly, alas, began to make subject to doubt by their acceptance of Galileo's folly.

I must admit that from the positivist point of view the Earth and the life on it rather appear as a miscarried, or in its present stage, dangerously flawed evolutionary development. That at first sight from a religious outlook it appears at best as a field on which good and evil, God and devil fight a see-saw battle with the devil holding the upper hand, I also do not deny. Yet I do not believe

that we Earthlings, are no more than the at the moment highest evolved specimens of some long-time natural caprice. We are not by chance living on a blob of matter adrift in nothingness. We are, on an unmoved world until the end of the present era here below on trial - sons and daughters of a Creator, whose glory the Heavens declare, and Who at His appointed Day will make all things new and forever abolish evil and death in an endless Golden Age, for which the deepest dreams of all men everywhere have been and are longing. How, seeing the damaged but still marvelous beauty, design, and order of everything around us, could this ever have come to be doubted? How, as clearly inevitable for the perfection of His ultimate purpose by an Almighty and Omniscient God allowed?

It cannot be repeated enough: nobody has ever incontestably shown the Earth not to be at rest in the centre of the Heavens. Numerous experiments have confirmed its stability, none have dislodged it. But rather than at last again to confirm its unique position and to consider the obligations this may impose on all we think and do, secularized astronomy has after 1905 welcomed relativistic impossibilities. Even those - and their number is growing - who have come to see that Einstein cannot be right still, however, cling to the Copernican gospel, mightily toiling to uphold the fiction of Mother Gea's insignificance among the many links of the Great Chain of Being.(75)

Pro and *contra* the Special Theory of Relativity - they all are wrong. And the simple space trials proposed in the present paper will show it. Mach may have declared all motion to be relative, the true state is that all motion is absolute, it being defined as such from an Earth at rest in a spatiality in and through which light - it is assumed - travels at constant speed. Assumed, to be sure - not necessarily true!

The question, then, quoted in the beginning of this paper can be categorically answered. Is the Universe rotating? Yes, it is, and we all can confirm this, walking with absolute motion on an Earth on which the bases of our telescopes are absolutely at rest. And the extrapolations of that fact have to be grappled with. Aberration and parallax, that is to say, now accordingly appear in a different light altogether. The former does not exist, the application of the latter has to be reversed. Furthermore: whether this Earth-centered Universe gives the quietus to curved space of necessity invented to save the appearances and the flat-worldly data? Maybe something like it will appear to be the case - I do not know. And whatever there is beyond the region of the stars I shall not even try to fathom. Living and thinking, as we are, in a space in which objects can only have length, breadth, and height, it is only by playing with meaningless marks on paper according to certain rules -as the eminent German mathematician Hilbert once defined his craft - that higher dimensions and elastic time become for theorists as easy as child's play.

The Universe, having been created, is hence, I believe, finite. Following Aristotle I hold that whatever there is "outside" of it is of such a kind as not to occupy space and not to be affected by time.(76) Folly it is for mortal man to assume himself able, brushing aside *Russell's Reminder*, to ply us with any ultimate pronouncement about the way the Heavens go. However, "inside" that Universe we are in a better position. The Earth is at rest, and drawing conclusions from stellar data, thought to be obtained from a circling planet, is therefore beating the air. Those apparent aberration circlets are in fact real orbits. And since these

orbits are practically of the same size, it follows that all the stars are at about the same distance from us, with less than a thousand of them slightly closer by. Which is to say that the Universe is bounded by a shell of stars - that *Stellatum* of Antiquity. Kepler, at least therein following his master Tycho Brahe, still defended this shell - two German miles thick, he estimated - against Giordano Bruno and his infinity of Suns becoming stars by virtue of their distance.

It is at this point that Hoyle's "as good as anyone else's but not better" shows itself to be only tenable for his relativistic model. As amply demonstrated earlier: whether we, elevating ourselves to the actually unattainable position of bystanders, assume the Earth to move through star-studded space or that space through the Earth - it makes for Earth-bound observers no difference in the celestial pageant. Contrariwise: if we are absolutely at rest in "flat" space, that conclusion does not square with the accepted view of the stars' positions. For, as after Bradley's explication of their apparently equal-sized orbits nobody wanted reasonably to doubt anymore, those stars are taken to be randomly scattered through an immense emptiness. However, if the Earth is at a standstill, then there is no aberration in the prevailing sense. Now the overwhelming majority of the stars are describing real equal-sized orbits, as it appears, "in step" with the Sun. And their designless distribution can in consequence solely be accounted for either by hypothesizing and artificial arrangement of orbits proportional to distance, which is hard to believe, or by a *Stellatum*, a layered shell of stars put to the purpose.

Applying Hoyle's trigonometric handling of stellar parallax(77) for such a *Stellatum* centered on the

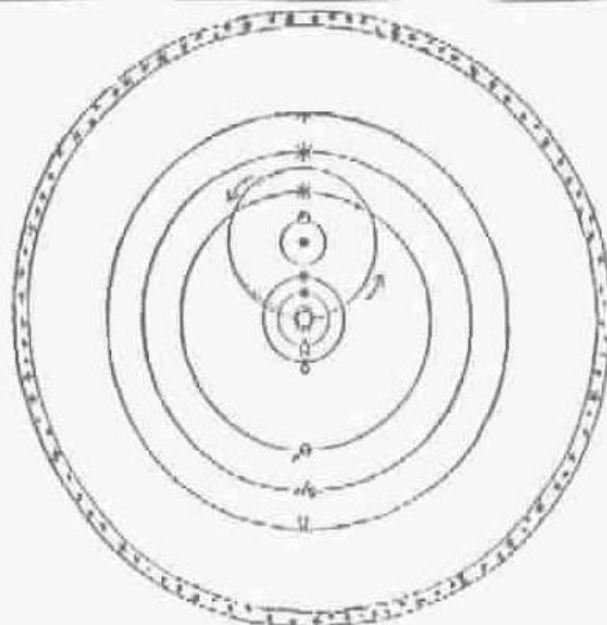


Figure 6

Sun, we end up with a modified Tychonic Model (see figure 6, and compare this with that on the essay's back cover)

In this essay I defend a strict geocentricism. I must, however, admit that among those who with me uphold the unique position of our Earth many do not share this "extremist" position. They will accuse me of slavishly clinging to long discarded Aristotelian concepts. Well, that is a matter for argument. French geocentrists, for example, united in the *Cercle Scientifique et Historique* (CESHE), following the views of Fernand Crombette (1880-1979), add, by means of extrapolating Bode's law

a trans-Plutonian "Black Star" to the Solar System. This enables them to postulate the axis of the System to be tangential to the Earth, with the Earth revolving around that axis annually.(78) So to say: for Newtonian reasons they are anti-Tychonian. Maybe - who knows? - they are right, but in case Einstein meets a downfall, the existence of the *Stellatum* will become a hard to be dismissed datum. Yet, that even then the Tychonian theory with this *Stellatum*, not centered on the Earth but on the Sun will be unacceptable, I am fully aware.

Why Impossible?

"Impossible!", the enraged reader will exclaim. I ask: "Why impossible?" That is what we see every cloudless night, hence logic cannot fault such a contingency, and weighing the *pros* and *contras* there are sound data and common sense arguments favouring it. Allow me the time to tick off a baker's dozen of the most salient among those.

1. Do not overlook the fact that the heliocentric interregnum, still adhered to in an astronomically not up-to-date view, is actually a mare's nest of the past. In truth the choice is between Tycho Brahe and Einstein - Galileo, *et al.*, are played out. On the one hand we can opt for a geocentric Universe, strongly intimating a Divine Designer; on the other hand we may prefer a megaevolutionary scheme. That is for a creation, maybe or maybe not, beginning with a Big Bang, leading to a cosmos in which the Earth is a non-entity, and on which we are the still far from perfect product of blind chance. For me, I repeat, the choice is not difficult I am sure that I am not an offspring of a tree-climbing monkey.

2. There is one consideration, echoing through and lingering behind all the pages of this essay: instinctively to objectify any extra-terrestrial event against a background taken to be at rest is to misjudge it. From kindergarten on we may have been trained - better: brainwashed! - to do this. But to parrot the ubiquitous: "The Earth goes around the Sun" is even on Galilean premises, let alone Einsteinian ones, an aphorism without truth content. Only when preceded by a conditional subordinate clause it should be considered seriously. Even then, to be sure, it does not rise above a wishful hypothetical level, but at least makes clear what it means to mean. That is: "Provided you allow that in principle in spatiality we can find a spot guaranteed and proven to be at rest, together with the Sun also solidly at rest, then I predict that we shall see that the Earth goes around the Sun". But...do I have to repeat the philosophical and, more directly, logical objections against that statement? Apart from the scientifically unattainable certainties, semantics already dispatches the argument as an act of begging the question. Who can define "rest" without referring to "motion"? Or talk about "motion" without presupposing "rest"? Indeed: relativity is king unless we somehow somewhere find three points demonstrably at rest. Searching as we may, not even one of these points we shall ever find - it is a certainty as old as the hills. Archimedes of old (287-212 B.C.) did not utter a profound new insight when he asked for a firm spot to stand on that would enable him to move the Earth. The first members of the human race pondering the problem will have realized the quandary. *In concreto* we cannot even kick a football absolutely across a field unless we have first made sure that the field is absolutely at rest. *In abstracto* it is easy to declare that we are

corkscrewing through space at a velocity of hundreds of kilometers per second. To make good that contention is a different story, and to assume the supra-spatial stance it presupposes leads us astray.

However tiresome it may have become: since ever and again without much ado this stance is assumed in all astronomical discourse, debate, and dissertation, I want to show its absurdity and tainted origin from yet a different, historical perspective. The fallacy is an old Greek one from which, it seems to me, Aristotle wisely shied away. As C.S. Lewis puts it: the Stagyrite's standpoint, "the timidity, the hushed voice, is characteristic of the best Paganism".(79) Above his *Primum Mobile* he never postulates himself - whatever is there is of such a kind as not to occupy space, nor thus time affect it. And during the first thousand years of the Christian era, whatever the slips of many a pedantic individual, Aristotle's modest doctrine spoke "loud and jubilant".(80) It is Gerbert of Reims, Pope Sylvester 11(999-1003), to whom a Dutch philosopher and historian, F. de Graaff - rightly I think - imputes the first moves leading to the emergency of the post-Copernican mind set. "Modern science, of which Gerbert is possible the most important founder, is not delineated by more factual knowledge, not by a more accurate observation, not by a broader and deeper insight than the old sciences knew. No, modern science only means a new relation to reality. The old knowledge understood the immediate relation with the creation, the new science only knows the abstract relation. Its principle is: the creation is by means of its representation reduced to a recognizable and useful object... The goal of modern science is to be master of all that exists. The representation that serves as a means to

accomplish this is not an extract of reality but only an image that man projects on reality."(81) That is: it brushes aside *Russell's Reminder* that a man cannot, and in science should not, arrogate a metaphysical viewpoint spuriously allowing him to become a bystander viewing the Universe against a background at rest. Or to borrow out of context a Pauline phrase: man cannot take a seat in the temple of God.

As said: to do this will lead us astray, and a Canadian who did not, as his national anthem enjoined him to do "stand on guard", considered himself beaten when he was not beaten at all. Seven years ago in a debate following my reading of a geocentric paper at a Christian College at Amersfoort, the Netherlands, an opponent succeeded in keeping the audience and me chained to his pseudo-supernatural viewpoint of objectifying the cosmos. He won the disputation hands down. Since then I have had to wrestle with this "objective" approach countless times. Often interested experts as well as laymen have driven me so handsomely almost into a corner that only in the nick of time I realized how they were seducing me to go "outside" creation for a better look.(82)

I realize that I should stop my thematical harping on this transcendental topic, the impact of which some people see immediately, but others just cannot get into focus. Yet the *vitium originis*, the basic error of modern astronomical theorizing, I must make clear to the latter if the present essay is ever to accomplish anything.

A not to be overlooked crux of the matter in hand is our understanding and application of the concept of relativity with regard to pure, *a priori* spatiality and the vexatious problems posed by its constituents, if any.

Leaving aside the Kantian conception, is there a matter-free space? Or is space no more than a consequence of matter, a relation between objects? Einstein clearly accepts the first option by according to empty space physical qualities and by asserting one absolute: the constant velocity c of light in a vacuum. And deliberately set against the possibility of an Earth-centered cosmos he has persuaded all those on that score agreeing with him to put their faith in an ontological impossibility. That is: with whatsoever speed we approach or leave a light source, our instruments register the appropriate Doppler shifts but measure the velocity of radiation received as if we are at rest with regard to the source.

Choosing the second, anti-Newtonian, Leibnizian option makes Poincaré's principle, the Earth's apparent immobility, at least understandable. In plain terms: the light any photometer observes it observes in that meter's own space in which that meter obviously is "at rest". Both options, however have to be rejected if the space tests I propose were to give a positive result. Only "tied-aether" theories, may then still be fielded against the defenders of Tycho Brahe, provided that by the force of evidential support they will be able to rise above their present, anti-Einsteinian, as well as anti-geocentric, wishful thinking.

Returning now to Airy's failure: we surely cannot look at anything unless from a point of view. And it is self-evident that there are only two of these points available to us. We can choose to observe the Universe either from somewhere in space or super-space, or else from the Earth underneath our feet. The first possibility compels us to view that Universe against a background at rest that willy-nilly we must imagine to be there when

we assign "motion" to anything. The Copernicans from before 1905, projecting themselves to a platform in classical "flat" space and then declaring us to be revolving around the Sun, strenuously toiled to substantiate that revolution. Nobody can deny it: they failed miserably. The super-Copernican vision of Mach, prefiguring "the great theoretical vision of Einstein", sounds *prima vista* impressive. But anything about the latter's four-dimensional mathematical model, its adherents can only apply to our three dimensional spatiality by means of an analogy. To wit, by presenting it to us as happening on the friction-less surface of a globe or torus. For cerebral super-space constructs cannot be measured in the world we live in unless presented in that world's terms. Not only that: never even in a million million years will logic compel us to accept a proposition as confirmed by an analogy. If, as is nowadays generally believed, the planet Tellus is corkscrewing through curved space, then this has to be made good here on ground level. To pontificate that something by definition physically measurable is true, yet cannot be measured is no more than a mere put-off. The heart of the matter remains this: anything will do if only it allows men to escape from a distasteful Earth-centered, and a Great Engineer proclaiming, Chain of Being.

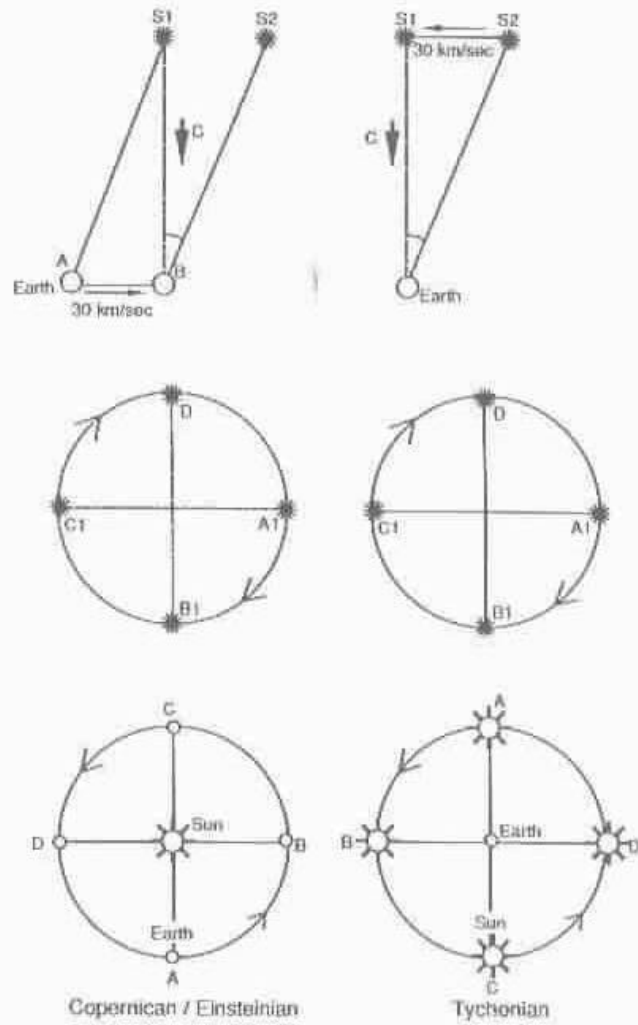
The second option, then, is to look at the Universe from the Earth on which we live, and thereupon to investigate whether space knows place and whether, such being the case, our temporal home in the heavens is at rest. Which, on authority delegated to me by its Creator, I hold to be the case. And data attesting to this will be obtainable by instruments capable of measuring

velocities in meters and duration in seconds. Space-time continuum experiments are beyond our ken, therefore we shall have to work with means applicable to "our" space and "our" time. Neither Galileo, nor Einstein can deny us the right to find out what model emerges from such a hard-nosed, common sense, and rational undertaking. An unwillingness to do this, and under the aegis of Einstein no longer even considering his stratagems to be possibly wrong, that I deem to be, as already said, the *vitium originis* of present-day astrophysics.

Positioning therefore ourselves on our Earth, stellar aberration observed with terrestrial telescopes allows two completely different explanations (see figures 7). And allow me to emphasize that "terrestrial". In what follows I do not instinctively look at the motions of either Earth or stars against a background taken to be at rest. The reasoning is strictly Earth-bound, and from a 49° northern latitude the stellar motions are dextrorotatory.

The accepted view of the phenomenon is the following. As already by means of two different analogies elucidated: my telescope has to be tilted slightly forward and observes the star as apparently situated at S_2 , this as a result of the Earth's 30 km/sec velocity. Keeping this in mind it is easily seen that when the Earth begins to move from A to B, the telescope begins to swing to the left. That is to say: its top projecting the *apparent* aberration circle on the night sky "shows" the star progressing from A_1 to B_1 . For aberration always displaces the stars toward the apex of the Earth's way.

The geocentric theory begs to differ from this



Figures 7

Copernican explication. The Earth is absolutely at rest in space, and the star is moving congruent with the Sun's motion. As a result of this our telescope "catches" the star at point of its *real* aberration orbit when it is already at S_1 . Consequently: when, as in the Bradleyan interpretation, the Sun is in position A between Earth and star, this star is observed at A_1 and so on.

The Copernican-Einsteinian and the Tychoonian understanding of the phenomenon both "fit the facts". Therefore only experiments testing their inferences may and must allow us to make a reasoned-out choice. As I have shown: without exception such experiments confirm or favour Tycho Brahe and censure or doubt Copernicus. Hence when around the turn of the century the patrons of that canon of Frauenburg ran out of plausible *ad hoc*s the only possibility left to them was to get on the STR bandwagon.

That their anti-geostatic persuasion could not but constrain them to do this is understandable. The Achilles' heel that until today only with *modus ponendo ponens* arguments they have been able to bolster their case is glibly and conveniently overlooked. Also it should amaze nobody that only by ostracizing nay-sayers and relentless peer pressure on persistent opponents their establishment has succeeded in upholding relativity's preponderance - thus the world wags. However, as soon as in the late sixties manned satellites offered the physicists the possibility to perform a *modus tollendo tollens* experiment, they did not jump at the obvious chance to verify their belief - and this I hold against them. True scientific spirits would have hastened incontestably to confirm their faith in the a-centric aimless Universe they are hankering after. Why didn't

they? Are they deep-down afraid of their ideal turning out to be an idol?

The point here is that aberration, if after an Einstein demoting space test it will have to be geocentrically understood, this indeed will make mincemeat of four centuries of progressive astronomy. According to Bradley the aberrational displacement is the angle between the star's geometrical direction and the direction in which the telescope has to be pointed to observe that star. According to the updated Tychoonian view the displacement is the angle between the direction in which the star is observed and its geometric direction at the moment of this observation. Or to formulate it otherwise: for the ruling view the aberration orbits are apparent and the Earth's orbit actual, but for the view actual here defended the former are actual and the Earth's is non-existent. And thereby hangs a tale!

To quote a standard astronomical college text about stellar aberration: "The effect is greatest when the earth is moving at right angles to the direction to the star, and disappears when the earth moves directly toward or away from the star. A star that is on the ecliptic appears to shift back and forth by a small amount in a straight line during the year, for during part of the year the earth is moving in one direction compared to the star's, and during the rest of the year the earth is moving in the opposite direction. A star in a direction perpendicular to the earth's orbit appears to describe a small circle in the sky, for its apparent direction is constantly displaced in the direction of the earth's orbital motion from the direction it would have as seen from the sun. Stars in between these extremes appear to shift their apparent directions along tiny elliptical paths". (83)

That is to say (see figure 8): standing on and moving in the plane of the ecliptic ABCD we observe no aberration of the star E on that ecliptic when the Earth is at B and six months later at D. The angle BES is, of course, $20''496$, but this and the observed Doppler shifts as well as the apparent changes of place tell us nothing

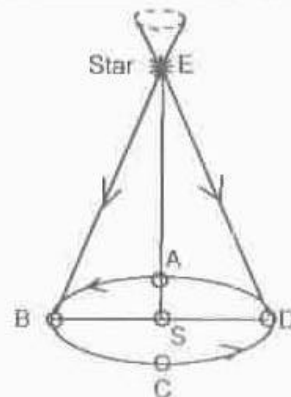


Figure 8

about the star's distance. Unless it is so near to us that angle BES turns out to be slightly larger than the standard value. For then this difference is a parallactic angle, which allows us to triangulate the star's distance.

In the geocentric model the situation is different, and this is easiest to demonstrate by means of a star on the ecliptic. Now the Earth is at rest in E, and the star's orbit is an actual one. When we see the star in B and D it has actually been at those end points of the line segment we observe. Now, the stellar orbit being equal to that of the Sun, we know the true length of BD to be about sixteen light minutes. Angle BES is $20''496$. And since with about 700 exceptions, we measure this $20''496$ aberration for all stars, a simple trigonometric calculation gives us the radius of the *Stellatum*, the shell in which they have been placed. That radius turns out to be about 58.1 lights days, *i.e.* one twentieth of a parsec.

As far as parallaxes are concerned: for those 700 "nearby" stars they are now, of course, far greater than

those in the Copernican model (see figure 9). Angle BEC is the standard parallactic aberration for the *Stellatum*, AED that for "nearby" stars, and angle AEB represents the Copernican parallax.

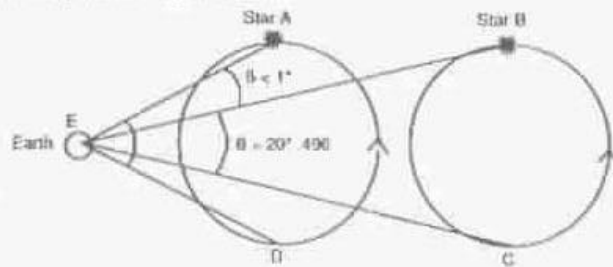


Figure 9

Finally: in the Copernican estimation we observe the stars where they were from four to many thousand of light years ago. According to the geocentric conviction we see the starry dome in the position it had almost two months ago. Or less if light's travel slows it down!

To be sure: in case Einstein will be experimentally affirmed I still shall not have to reject a geostatic cosmos. What every descendant of Adam and Eve with their sensorium, with all their senses, experience may still be true – we shall never know! I may, going one step further than Socrates, even generalize this foundational "never" for all aspects of being. To wit: unless in all sciences and in ethics we accept an above proof exalted Divine input, our knowing is a groping in the dark for a hold on nothingness.¹⁰¹ And beyond that: unless an Omniscient Logician stands behind the logic for which He conditioned our brains, all matter-free thinking and abstract reasoning resembles a blowing of soap bubbles.

As far as astronomy is concerned: Pope Sylvester II

improved and introduced, among others, the so-called astrolabe (from Greek astron-star and lambanein - to take), in essence the ancestor of the multiform instruments now used to measure and, presumably, thereby *in abstracto* to master the architecture of the celestial sphere around us.

In the museum at Torun, Poland: "There exists a most remarkable painting of Copernicus that allows insights on his background. It shows Copernicus praying with open eyes. On his right a crucifix with a corpus is portrayed. On the opposite side of the crucifix astronomical instruments are shown. Clearly set off is the astrolabe introduced by Sylvester II." And significant is Copernicus' prayer underneath the painting. "I do not ask for the grace granted to Paul, neither do I demand the forgiveness of Peter, but I incessantly pray for the forgiveness which thou on the wood of the cross hast granted to the murderer."(85) Did Copernicus have an inkling of the consequences his theory would have? In the modern Universe God is a superfluous luxury. As far as up-to-date astrophysics is concerned He is dead and has had His day. To quote Alexander Koyré about astronomy's progress after the wholesale acceptance of Copernicanism: "The infinite Universe of the New Cosmology, infinite in Duration as well as Extension, in which eternal matter in accordance with eternal and necessary laws moves endlessly and aimlessly in eternal space, inherited all the ontological attributes of Divinity. Yet only those - all the others the departed God took with Him."(86) And when at the close of the nineteenth century it had become insuperable to reconcile the Newtonian celestial clockwork of that New Cosmology with observational data, the most plausible inference was left out of consideration. The possibility of a basic

misconception in the defunct system remained outside the theoretical field of vision. Not for a moment did anybody bethink himself whether the clash between "new" facts and the fiducial - but never proven! -Galilean natural philosophy was, maybe, due to the sacrosanct Copernican revolution. Astronomy opted for an approach that made short shift with even those remaining ontological divine attributes by assigning irrational and impossible qualities to the Creation's mode of being. For when in their never-never land of relativity the distances between a number of clocks are increasing a wondrous thing is happening, we must conclude. Believe it or not: then each of those clocks works more slowly than all the others - which, I am sure we will agree, is impossible in our real world.(56)

3. The Tychonian interpretation offers the simplest possible solution among all those ever proposed of Olbers' paradox - a given that they who like to operate with Occam's razor may well take into account.

4. Nothing, but nothing will change as far as observations are concerned. When somebody once remarked to him how stupid medieval men must have been in thinking that the Sun was orbiting the Earth, Wittgenstein is said to have replied: "I agree. But I wonder what it would have looked like if the Sun *had* been circling the Earth". In his excellent *The Day the Universe Changed* , a book that everyone should read, James Burke, telling this anecdote, comments: "The point is that it would look exactly the same. When we observe nature we see what we want to see, according to what we believe we know about it at the time".(87)

5. What would drastically change are the extrapolations from our observations. I simply cannot

withstand the temptation to repeat a warning by Eddington, which I have already quoted. "For the reader resolved to eschew theory and admit only definite observational facts, all astronomical books are banned. *There are no purely observational facts about the heavenly bodies* (Eddington's emphasis, v.d.K.). Astronomical measurements are, without exception, measurements of phenomena occurring in a terrestrial observatory or station; it is only by theory that they are translated into knowledge of a universe outside."(42)

You will say to me: "Physician, heal thyself. Your weird scheme is a theory too, and certainly the weirdest possible." Agreed, it is a theory, and if and when the experiment I propose shall have put Einstein's ideas at long last on a firm footing, I grant everyone the right to call me a misguided fool. But not before this will have happened! For I challenge until then, and therefore here and now, all modern scientists to come forward with one non-relativistic reasoning that, without affirming consequences and introducing *ad hocs*, succeeds in rebutting the straightforward theoretical conclusions here drawn from the panoply of the celestial phenomena. They cannot do this, and the foremost thinkers among them know this all too well!

So far regarding the ratiocinations of those who refuse to honour and accept any otherworldly input. A few remarks over and above that I must add, more directly aimed at the men and women who with me have been impelled to believe that the Bible is the Book of Wisdom given to us by the Great Creator God in Whom we live, and move, and have our being.

6. "Nonsense", I have painfully found out, they exclaim almost to a man. I ask: "Why nonsense?" Why

should the oldest model, being the strangest, not be the truest? Does the stupendous variety of life forms and landscapes displayed within the Earth's tenuous biosphere not perfectly match with a likewise kaleidoscopic panorama of a stellar sphere encompassing creation as a whole? Do these two Hebrew words "and (the) stars" by the farthest stretch of imagination invite us to distill out of them a Divine act of such a size and grandeur that by comparison even the creation of the so-called Solar System is less than a drop in a bucket?

7. "Yes, but science..." - that theistic evolutionists of all stripes demur I can understand. For them, with regard to the creation account, the time-bound results of ever incomplete human research are first, and the Scriptures a second-best, adapted as Genesis is, they allege or settle without word of mouth, to the understanding of Homo Sapiens barely risen above the mental capacities of monkey-dom.

After the glorious appearance of modern science we now "know" that we cannot read the Creation story as in any way factual to the first degree. To argue with these brethren before their hallowed secular masters will have been compelled to take a turn for the better may well be pouring water in a sieve. Creationists worthy of the name, from the cradle on conditioned to believe in the stereotyped cosmos of popular astronomical texts, may be wise to think twice, however, before they join the "Impossible" chorus of the Christian majority. They squarely differ from this majority with respect to botany, biology, and geology, but are less outspokenly fervent with respect to astronomy, in which discipline they save the appearances by means of an exegetical *tour de force*,

together with fairly improbable and any way unprovable *ad hoc*s. Question: why should the ruling paradigm in that oldest branch of natural philosophy still have any say whatsoever in Creation science? Behind its public facade it today hides a hodgepodge of far-fetched tentative models bristling with anomalies.(88) Just compare the data by means of which the evolutionists on the grandest cosmic scale build their models with those of the evolutionists in a narrower, Darwinian sense. The latter have at least deaf-mute bones they can examine and silent rocks they can analyze. The former have nothing outside their observatories but untouchables that cause their optical instruments to exhibit spectra and their radio telescopes to stutter clicks.

8. It is always possible to impress some clever pattern on random sets of givens. Biologists, constructing their genealogical trees, "show" in that manner how humming birds and crocodiles are distant relatives, and they expect us to swallow such cunning confabulations as testable actualities. In the same manner, but with even less solid observations to build on, astrophysicists discuss in their diagrams the life cycles of stars, their composition, and their distance from us. Why then do creationists soundly reject Darwin, but still kowtow to Copernicus? No man should serve two masters, should he?

9. I have as yet not been able to find one orthodox theologian willing to give me a serious hearing. This is something that in the beginning hurt me. Gradually, however, I have come to realize how it had to be expected. These people are so sure of the truth of their in the nature of things fallible dogmatical extrapolations from a Message they declare to be infallible in what it

says, that apropos of nothing they excommunicate each other for almost any doctrinal difference. Small wonder that these theologians assume the articles of modern scientific faith to have the same kind of infallibility, which they take for granted in their own deductions from Holy Writ. People for whom the Bible is no more than a quaint old book, and who therefore have no interest in saving it at the cost of scientific knowledge, gladly admit that the Scriptures proclaim the preeminence of man in an Earth-centered Universe. To doubt or to deny it, they will affirm, is to wrench the meaning of the Genesis text. Before modern science raised its arrogant head very few called this truism in question. However, after Galileo we have to reconcile the geocentric structure that Holy Writ considers self-evident with the facts that for almost four centuries astronomy has professed to "know", but today is no longer too pertinently sure of. This momentum-gaining turnabout in the philosophy of science theologians are not yet aware of and will surely be loath to take to heart, since such a new - in fact very old - concept of human knowledge cannot but begin to rattle the foundations of their dogmatic certainties also. Anyway: caught between a hard rock and an immovable place the defenders of the Infallible Word do with regard to Genesis 1:1-19 not shilly-shally: the literalness of that periscope is the loser. But the thing that baffles me to no end is that in relation to Genesis 1:11-13 and 20-31 the creationists among these theologians defend tooth and nail its literalness. Why this measuring by two standards?

It is here not the place to elaborate on such ambivalence, but behind it hides the vexed issue of anthropomorphisms in Holy Writ. "This is what the

Word says, but we shall tell you what it means, for the Divine Author talks to us in the way a father talks to little children, who cannot really understand him yet" Thus, from Calvin on, the speakers not being such children, but they themselves being perfectly able to make clear to us what God could not make clear! Speaking about conceit...? With heliocentrism for many generations bred in the bone, and biological evolution, relatively spoken, a newcomer, a growing number of Christians again dismiss the latter. Why then that unwillingness to look at the outdated Newtonian world picture with a grain of doubt? Let alone to doubt the weird hypotheses secular astronomy had to betake itself to, now that picture has become untenable?

10. There are, but these beyond the restricted scope of the present paper, still at least three fields of enquiry left that may will come to play a part in future considerations with regard to a geocentric cosmogony and cosmology. Lingering at the fringes of the theological-exegetical free-for-all is the vexed issue of the Gospel written in the stars,(89) and the impetus of a restored Stellatum on that esoteric theme. Physically there remain the topics of a long-time stability of the Solar System, and the never absolutely laid to rest likelihood - which I take seriously! - of a non-Newtonian theory of gravity.(90)

ii. Pascal, facing the inescapable outcome of a consistent Copernicanism, has said that the eternal silence of these infinite spaces terrified him. So did it me - until I became aware that there is not the slightest truly scientific reason or evidence to take the modern view of the cosmos seriously.

Thankful I am for the Eternal Word that ridicules

the idea of mankind being no more than a freak occurrence in a boundless cold and dark void. Which idea, therefore and of course, has been, is, and will be contradicted by every *ad hoc* -less rational experiment.

12. "The Heavens declare the glory of God, and the firmament shows His handiwork", David exclaims in Psalm 19. Indeed, they do - who on a clear night, seeing the constellations slowly wheeling through the dark dome of space, does not stand in awe? Or does not feel himself and the Earth under his feet to be insignificant minutiae amidst a majestic pageant? From Antiquity on, thinking men have realized that "the earth, in relation to the distance of the fixed stars, has no appreciable size and must be treated as a mathematical point"(91) For Ptolemy as well as for us, however, this does not compel us to downplay our importance in the totality of being: size and worth are not correlate. A rough diamond is a nothing compared with a heap of pebbles, yet sell it, and you can buy a gravel pit, and still have money to spare. To the contrary an object's place and station clearly indicate its paramountcy. In Parliament the Speaker may be a small man, but he is not hidden among the backbenchers. If the present-day astronomical world view would have come to the indisputable conclusion that after all the Earth is an unique phenomenon in the Heavens, then there would have been less incentives to renounce its acts and facts. Such a pre-eminence granted, and keeping in mind Russell's Reminder that after all for a metaphysical bystander the Earth and not the Heavens may be at rest, then the a-centric Universe of the Hoyles and Sagans could be considered as a model at least breaking with Newton's Copernicanism. For an orthodox reader of the Bible there would be fewer

questions with regard to curved space than with regard to the heliocentric vision that demoted our dwelling-place to one of a set of similars. The multiform parameters necessary for the maintenance of the living Earth appear to have been minutely structured and combined for that purpose, the impact of their attunement equalled nowhere in the Solar System's barrenness. Yet this attunement is taken to be no more than one of a number of lucky throws in a macro-evolutionary roulette. Hence secular science labours with might and main to find extra-tellurian evidence that will reveal life-bearing planets to be a not uncommon occurrence. An Interplanetary Society has dedicated itself to that search, and countless science fiction novels and movies are brain-washing the *hoi polloi* with this doctrine of space harbouring a diversity of civilizations. For any connotation that the human race is something special and has been assigned a peerless habit in the Heavens - it must, cost what it may, be kept out of mind. It might evoke the teleological spectre that modern man, come of age, wants, and has decided, to lay at rest.

To believe that the first eleven chapters of Genesis, if not literally then at least in meaningful myths, testify to the origins of the reality into which we are born, this, I maintain if not openly then at least implicitly, obliges Christians to acknowledge that the Earth is more than a typical throw-off from a condensing and spinning minor star. There are peculiar people for whom Hebrew is no foreign language, and for whom already more than three millennia the Torah has been Wisdom above all wisdom. To them the ever-changing theories of science are, by comparison, puerile prattle. A 1944 Nobel laureate, I. I. Rabi, born and bred among them, was as a boy

accordingly a Tychonian until gentile information told him better things. "Because his family was Orthodox and fundamentalist in its Judaism, Rabi had not known that the earth revolved around the sun until he read it in a library book."(92)

Indeed: a library book. But astronomy books, misleading as - courtesy of Albert Einstein - their heliocentric illustrations and explanations are, seldom or ever spell out the a-centric concept to which the Copernican revolution has inevitably led. The Earth is now for it no more than a typical pellet of matter somewhere in an out-of-the-way corner of the Universe. How can orthodoxy, whether Jewish or Christian, reasonably harmonize this with an Earth according to the first chapter of the Old Testament already adorned with trees, and flowers, and grass before Sun, Moon, and stars suddenly appeared in the emptiness of the Heavens?

13. A last point: theistic-evolutionist Bible believers have, of course, no difficulty with a Big Bang and endless ages already elapsed before the Creator began biological evolution. with self~reproducing clots acurdling in a glutinous fluid. How do they reconcile the countless years required by such snail-slow processes with the promise of a resurrection of all the dead long returned to dust in the twinkling of an eye when the trumpet shall sound? If God can make that happen, why should or would He have needed many millions of years to get from unicellular creatures to billion-cellular men? If I may believe St. Paul, then He will restore all the dead who ever have lived to life instantly. Or must I, maybe, my thinking illuminated by the light of sciences, reverently understand this as a twinkling of an eye of God, which for us takes five hundred million years?

In a recent article from the skillful hand of Dr. Stephen J. Gould he claims that the fact of evolution is as well established as the revolution of the Earth around the Sun. On the other hand he allowed that absolute certainty has no place in the lexicon of scientists.(93) Now it would be an insult to assume that a scientist of his stature never should have heard about a man called Einstein, according to whom we just as well may vouch for a Sun revolving around the Earth. And this being the case Gould, on his own cognizance, cannot rule out creation.

Accordingly my anti-instant creationist brethren will do well not to exclude the possibility of change of heart becoming necessary for them, since even Gould advises them not to take their present convictions too absolutely. And in case the Sun will be shown indeed to circle the Earth, these brethren will be led, I hope, to realize what Holy Writ really affirms with regard to cosmology as well as with regard to biology.

Lastly, with reference to St. Paul's "twinkling of an eye" an up-to-date item, reminiscent of such a Divine instantaneous "Let there be" - and there is and there are! Secularist confabulators rhapsodize about their Big Bang of a dozen or so billion years ago as if it has been as undoubtedly factual as last year's pyrotechnics on the Queen's birthday. Well, that certainty these brethren may do well to take with grains of salt. According to a news clipping in the December 1987 *Creation Research Society Quarterly* Alan Guth, professor of astrophysics at the Massachusetts Institute of Technology, is saying that the Universe expanded to its present size and structure of stars and galaxies, not in ten to twenty billion years as previously claimed almost dogmatically. Guth says "the whole process lasted less than a second."

Bible and Science

The Bible Is Not a Scientific Textbook

Wearily to ward off a hackneyed, and at least with respect to me misdirected, accusation that I am using hoary myths as scientific veracities, I yet must elaborate this point somewhat more to make it clear that I do not. Sure, I have referred to Holy Writ time and time again as an ontological not to be undervalued metaphysical given in deliberations about the ultimate ground of being. A given that hence by modest instrumentalist science should be considered as information from a possible transcendental Bystander. However, only as such it has been introduced whenever I judged this necessary, but not as affirming anything more than the by its Maker proclaimed Earth-centeredness of His handiwork. A plain historical fact to be accepted in faith and "inside" the totality of perceptible being amply confirmed.

The Good Book appeals to mankind as a whole through all historical time, and in no way expressly endorses the scientific establishments' theories of one or another quarter century. The most erudite up-to-date professors of astrophysics and the last, not with their

ephemeral dicta embued Papuans - the Divine Word addresses them on equal terms. Every morning, when waking up and looking around, all men find themselves situated upon a solid, flat Earth around which the Heavens revolve. Whether or not they accept that this Earth is the kingpin of the Universe - standing on it they do neither feel it turning nor observe its curvature. They see the Sun rising and setting. Even the doughtiest defender of the modern a-centric view ever expresses it otherwise, unless he is asked to catechize the uninstructed on celestial kinematics. The fact that this-worldly oriented education urges us to discard such felicitous simplicity does not in any way change our first-hand collective representations. And it is to these representations that Scripture adapts itself. It speaks, so to say, in a phenomenal mood, leaving with regard to astronomy, as well as with regard to biology, geology, and all other branches of scientific investigation, any theoretical underpinning severely alone. To quote, as already said, with Luther Joshua's "Sun, stand thou still" I consider therefore using the passage beyond its intended import. Genesis One and Two, and in the nature of things - no humans being there yet - unverifiable report by the God of Truth, I do not dare to doubt or theoretically to twist around. However, apart from that I shy away from any other "geocentric" text - well aware that on this point I part company with virtually all fundamentalists and orthodox Catholics. The Bible, as I see it, first and foremost presents us with a religious and ethical message, expressed on the level of the highest common factor of human comprehension. From the pristine awakening of consciousness in the Garden of Eden to our age in which science purports to be capable

of superseding Divine revelation. Therefore I waive, apart from calling upon it in the context of the *Armstrong Alert*, any use of its supra-scientific message as evidence in my down-to-earth astronomical ratiocinations. Which message sublunar wisdom in any case refuses to accept, either wrongly as of no value for solving the fathomless riddle of life's destiny, or with some justification as not applicable to investigative science. Logically even my main Genesis 1:1-19 argument can, of course, easily be turned against me - as this is done, above all, by my theistic and progressive evolutionist brethren in the faith. "Precisely", it is retorted, "because these not yet in exact science engaged Adamites could in no way be expected to grasp Kepler's laws, Newton's gravitation, and Einstein's mathematical generalizations, the Bible tells a non-factual, attractive tale. But now we have been allowed to know better, and should therefore be leery of ascribing to the opening verses of Genesis any strict descriptive value."

I do not buy this specious argument. For behind it lurks, I hold, a conceit we should abhor. Even today less than one in a thousand humans has any clear understanding of the laws regulating the cosmic clockwork. Yet all of them, and the theologians of the International Council for Biblical Inerrancy to a man, believe just as firmly that the Earth goes around the Sun as their pre-Galilean ancestors were convinced of the opposite. If God had told - but He did not - the first men made in His image and after His likeness that He had used the creational procedure at the moment proclaimed to have been used, those men would have accepted this just as well as the world does this today... without bothering much about the brain-teasing intricacies of

motions and forces. More important: the reasoning of these self-styled orthodox Christians, which I am attacking here, debases clear, intelligible divine words and exalts the A.D. 1988 believed-in human derivations from deaf and dumb phenomena. Derivations that in the ages past time after time were found just as fictitious as the present ones tomorrow or next year will turn out to be. I refuse to join such halting between two opinions, of which the one is founded on the certainty that the God of Truth speaks truth from Genesis 1:1 to Revelation 22:21, and the other rests on the quicksand of ever-incomplete and never-final human theorizing.

However, to leave this rueful aside: rather give me the manful "either-or" of people who at bottom at least show true respect for the revelation they have decided to reject than the waffling of in-betweeners who run with the hare and hunt with the hounds. Those who have done with all unobservable super-natural fancies will rightly remark that any report asserting to give us the story how the starry Heavens and the living Earth emerged into being can only be adjudicated in two ways. Either the Biblical one is factual Revelation given by an all-wise, all-knowing, Almighty Creator, and then he who tampers with it by means of human conjectures and refutations is a fool of fools, or else the Hexaemeron is the brainchild of self-styled visionaries, deserving to be complimented on it. For so much must be admitted: it gives "a portrayal of the creational events of a powerful and fundamental magnitude..., which by its level of thought and conceptual frame stands in the sharpest contrast with all other creation stories."(94) And 20th century science, pursued by men come of age, has made the choice to which Copernicanism in the long run could

not but drive it: the Great Designer of Genesis is a day-dreamer's fiction.

I concede: there is no way around the impediment. If I would try to win my case by means of the many Bible texts that take in their message the attendant phenomena "as is", or would present poetical utterances as scientific endorsements, then I would go beyond my warrant in investigative astronomical discourse. As did, e.g. St. Boniface, who in 748 A.D. complained to Pope Zacharias that Abbot Virgilius of Salzburg believed in the existence of antipodes.⁹⁵⁾ Should I, with him, read Scripture as a vademecum then I must admit that he and the few still remaining "flat earth" theorists have a point. Even Mother Gea's sphericity I cannot convincingly deduce from the inspired text. We should, however not debase the Bible to an encyclopedia of all this-worldly knowledge. I may as well try to extract ethics from Euclid's *Elements*.

To get a hearing from the side of secular science I have to come with observable factual phenomena. And, alas, the same counts for the most solid creationist believers in an infallible Bible. They have been from earliest childhood so through and through Copernically brainwashed that it is virtually impossible to make them see that their childlike acceptance of Genesis 1:11-13 and 20-31 is without rhyme or reason when compared with their understanding of Genesis 1:1-19. Which "understanding" is not child-like at all, but flies in the face of what a first and faithful simple reading impresses on a mind not already "knowing" better!

In short: the tenor of Holy Writ is, all its phenomenalism granted, basically geostatic, I maintain. Agreed: to say this can - and will! - by judged as an

example of credulous and infantile gullibility. Just let secularists and theologians present me with rock-hard evidence that such is the case. Then I shall offer my *peccavi* - but not earlier! And going two miles with them instead of one: a simple manner to obtain such evidence I have already suggested.

De Labore Solis

Tradition has it that, when he was visiting Pope Innocent II in 1139 A.D., St. Malachy O'Morgair, Archbishop of Armagh, Ireland, gave this Pontiff a list of short and enigmatic Latin phrases prophetically alluding to the Servants of servants still to come after him until the end of our age. About the value of these auguries *per se* I withhold comment. Yet in the context of a history of astronomical science at least two of these mottoes appear to me singularly apt.

On April 4, 1615, during "what has been described as the first process against Galileo"⁽⁹⁶⁾ the only wise man in the trial, Cardinal Robert Bellarmine (1542-1621), wrote a letter to the Carmelite monk Foscarini, who had published a book in defense of Copernicus. This well-known letter has generally "been interpreted as an assertion of the cognitive limits of scientific theories",⁽⁹⁸⁾ in this case specifically with regard to the validity of the heliocentric hypothesis. It is enlightening to read how the Study Group constituted by John Paul II, eager to see Galileo rehabilitated, plays down the force of Bellarmine's letter. "Historiography has commonly accepted Duhem's (1908) interpretation of the topics of the letter, although not necessarily his positive evaluation of them."⁽⁹⁹⁾ Why not? - no arguments are

given! "To demonstrate that the appearances are saved by assuming the sun at the centre and the earth in the heavens is not the same thing as to demonstrate that in fact the sun is in the centre and the earth in the heavens", thus the Cardinal, "I believe that the first demonstration may exist, but I have very grave doubts about the second, and in case of doubt one may not abandon the Holy Scriptures as expounded by the holy Fathers. "(100) If there were a real proof, then, yes then..., but in 1615 there was none. And today, I repeat, there still is not any.

In taking this "Wait and see" standpoint with regard to final conclusions about all celestial matters terrestrially observable, the Cardinal echoed the so-called "instrumental" insights of, to name a few authorities, the heathen Claudius Ptolemy (c.100-170) in his *Almagest*, the Jew Moses Maimonides (1135-1204), the Catholic Thomas Aquinas (1224-1275), and the Lutheran Andreas Osiander (1498-1552), as the latter expressed it in his anonymous foreword to Copernicus, *De Revolutionibus orbium coelestium*. Tersely to formulate the opinion of these four distinctly heterogenous luminaries: a theory may be useful, but is therefore not yet truthful. There are only two methods that will enable us to overcome this limitation of all scientific endeavours groping for true facts behind the bare facts. Either an infinity of affirmative test results without any outcome queering the pitch, or otherwise the endorsing input of One Knowing Everything will offer us certainty. Sadly enough, the former way of doing cannot be walked to its end in potentially endless time, and the second option requires acceptance "in faith". For foolish is a pupil knowing less than his teacher who questions that teacher's dicta. A man may consider himself the

measure of all physical things about which he knows something, but a meta-metaphysical judgement seat from where he will be authorized to affirm or disqualify a message presenting itself as metaphysical... that seat is must definitely not within his reach.

It is not only befuddled Biblicists, who profess such a humble outlook. Bellarmine, siding with savants of old, was also ahead of his time and now earns posthumous approvals. For after three centuries of an arrogant "scientific method" being the vogue, things have come full circle. Today "very few philosophers or scientists still think that scientific knowledge is, or can be, proven knowledge", (101) a statement that, I hold and have shown, needs no super-human intelligence for its affirmation. As John Paul II on May 9, 1983 warned an illustrious audience, including 33 Nobelists: epistemological frontiers impose indispensable rules and delimitations on our questing towards that which is universal and absolute. (102) No explanation, no theoretical approach has ever been without more or less plausible rivals. Hence for a final choice between them, hardheaded logic contends, the adjudicators will have to be conversant with all possible choices - which they are not. Myopic therefore is he who does not wisely always keep a back door open for an as yet unknown solution until he shall have found the philosopher's stone. I certainly do this with respect to the nuts and bolts of the astronomical model I prefer!

Mundus vult decipi, ergo decipiatur - the world wants to be deceived, therefore be it deceived! Every attentive student of the Galileo affair knows that the man had not a shred of positive evidence. His telescopic observations made short work of Aristotle's ideas about

the structure of celestial bodies, but nothing more, for "mountains on the moon prove it is not a perfectly crystalline sphere, but they do not prove that the Earth moves".(103)

Be this as it may: the Chief Mathematician and Philosopher of Cosmo II de Medici had his mind made up, and therefore the sagacious words of Bellarmine fell on deaf ears. So equally did the latter's 1616 *Declaration to Galileo Galilei* , ostensibly on second thoughts toned down to bare minimum by denying any abjuration on Galileo's part, but by implication warning him to keep science as science and Revelation as Revelation.(104)

Unhappily, such a wise disengagement between these two incompatible kinds of information was not kept in sight. *Pro* and *contra* a geostatic view, as is the way of the world, the attitudes hardened. Eighteen years later, twelve years after the Cardinal's death, and his astute approach fallen into oblivion, the outcome of the 1533 Galileo trial put the Church of Rome in a corner she should have shunned at all costs. Pitting Revelation against human theorizing, the Inquisitors demeaned the former and unduly exalted the latter. If they had expressly allowed Galileo and his followers the use of the heliocentric theory as a working hypothesis but no more, then the Church's position would, from 1533 until today and for all time still to come, have been and be logically untouchable. Not only that: by unremittingly refusing to budge unless faced with indisputable evidence, mankind might have remained aware that Copernicus' model is only one out of many - as during the first half of the 17th century still was acknowledged.(105)

However, cutting down Galileo's claim to its right

and real proposition of "hypothetically - not absolutely", and consequently thereafter dismissing the case as irrelevant with regard to the accepted understanding of the Biblical view on the Earth's position?... Diehard Aristotelians managed to keep that procedure, advocated in Bellarmine's Foscarini letter, out of the inquisitors' deliberations. And Rome soon afterwards had cause to regret the short-sighted language of the Holy Tribunal. Among other missed opportunities it robbed the Vatican of the chance to confront one of its arch-enemies, Newton, with a sound epistemological lesson, which today would be acclaimed to have been *ad rem* and might have caused the great Isaac's epigones not to be overly cocksure. For a heliocentric-style orrery is a nice piece of machinery to play with, but when it comes to explaining the fine points of calculation and prediction we have to stop the little brass ball representing our Earth and let, after the manner of Tycho Brahe, the Sun and its attendant planets whirr around Mother Gea. "So what, why not?" Bishop Berkeley (1685-1753) would have commented, chiding as he did Newton's appeal to water in a rotating bucket - a criticism now shared by all and sundry who believe in an Einsteinian Universe.(106) But in doing this they overlook the plain truth that a man finding himself within a system he cannot escape from will, if he is wise, abstain from confident pronounce-ments about the status of that system as a whole. Never neglect *Russell's Caveat* and the *Armstrong Alert* : theory concocted by observers "inside" and truth as seen by an "outside" bystander are two that the Holy Office should have maintained. And thereafter the Church could have let Galileo and his credulous disciples happily alone with their guesses and proofs-no proofs!

Today the clamour for that Mathematics Professor of Padua University's rehabilitation demonstrates to all who want to see, and do not practice ostrich policy, the philosophical mainspring activating the be-all and end-all of its advocates. Their ultimate aim was already underground at work long before and during the course of the Italian Renaissance. Still in disguise it began to come to the fore in the 16th and 17th centuries by goading the scientific progress in a direction favouring a monistic materialist religion. From about 1750 on that final purpose has become more and more blatantly proclaimed. However, even in our time the sinister force that prompted a hailing and hallowing of the "Copernican Revolution" has not yet fully reached the end it desperately has had in view - but will never reach! - since Adam's from eternity pre-ordained fall at the world's beginning. There are still Churches and Christians to be ridiculed and pilloried for proclaiming a God, Who is a Creator and in His Risen Son, Jesus Christ, a Loving Father, Who wills that, as St. Paul reminded Timothy, all men should be saved.

Observe what the wisdom of our age wants the Bishop of Rome, John Paul II, to do: he must be compelled to admit and declare that those among his flock are fools who prefer the Bible's information about the whence of the world above all scientific confabulations presently believed in. For by implication they may in the light of science then come to see how ludicrous an orthodox faith is that treasures Holy Writ as heavenly Wisdom, and not discards it as a sop for simpletons.*

The Tychonian theory the foremost astrophysicists now declare to be - I have already quoted Hoyle on this

See Addendum II

score - "as good as anyone else's - but no better." Yet John Paul II is urged to proclaim Galileo to have been condemned unjustly for teaching the not to be doubted truth of a today no longer avowed heliocentric view. Why this double-tongued insistence? A moment of reflection on the doings and dicta of astronomers from Copernicus to Sagan will make this clear: the secular Weltanschauung, its abettors correctly sense, stands or falls in the long run with the status of Mother Earth in the Heavens around her. Believe that Copernicus had the last word about the issue, then you are logically bound to end up with a Universe in which we somewhere live on a trifling speck of dust. Believe that Tycho Brahe had his options right, then we find ourselves in a uniquely preferred place. Small wonder that Malachy laments the genesis of "A Perverse Race" as characterizing the fifth Pope Paul's (1605-1621) reign!

There is more. The rudimentary technology of the 16th century could not yet provide Tycho Brahe with instruments capable of measuring aberration or parallaxes. That great Dane should therefore not be blamed for concluding the Earth to be central in the roundelay of the stars. In this particular, as I have tried to show, his model has to be corrected. In reality the Sun is leading the motion of the stars fastened far away on the heavenly vault. From the geocentric point of view it is the Great Light, called into being on the fourth day of the Hexaameron, that, ceaselessly toiling, carries the Universe's dome around us. Lo and behold, and wonder: "De Labore Solis" (the Labour of the Sun) will be such an important astronomical concern during the episcopate of Pope John Paul II (1979-...) that Malachy selects it to mark that epoch!

And That's the Reason Why!

As the late Arthur Koestler, certainly not a Bible-thumper, saw it, "the cosmic quest set in motion by Galileo and his successors has destroyed the medieval vision of an immutable social order in a walled-in universe together with its fixed hierarchy of moral values, and transformed the European landscape, society, culture, habits and general outlook, as thoroughly as if a new species had arisen on this planet."(107) So it is, and I still have to find one historian of whatever religious or philosophical stripe who in essence disowns this appraisal or denies that the impact of the Copernican revolution has been far-reaching in its corollaries. Even more to the point in summarizing the final results of the "New Science" is Theo Löbsack, a German popularizer of the progress mankind has been able to make after discarding the Ptolemaic outlook of Antiquity and Middle Ages. "Galileo's way of thinking laid 350 years ago the foundation for the modern science and technology, and into what crisis he since has brought theological thinking is difficult to describe. Until today the Church fights for an inventory of religious truths that are no longer compatible with the insights gained by means of the inductive method: among them the dogmas and the notion of a Supreme Being, an Almighty Father in Heaven."(108)

In a 1987 trumpet blast by means of a circular letter, calling upon all friends of science to join his anti-creationist crusade, Isaac Asimov is also refreshingly candid. The battle, he warns, is not only against anti-evolutionism in physics and astronomy. It also concerns the fight against benighted dimwits "introducing

inflexible concepts of sin, guilt, and a hierarchical relationship descending from God to man to woman to child."(109) Indeed it does, and I am grateful to read in black on white the motive lurking behind the vituperation and name-calling to which Asimov, *et al.* subject "the rotting corpse of Christianity."(110)

The Half-Way House of the Creationists

Unreservedly siding with the brethren by those secularists attacked, I must, however, confess that I consider the strength of the creationist position seriously flawed. The Bible is primarily concerned about things not seen, less about the temporal things observable in the present age. If you will: the Scriptures tell us how to go to Heaven, not how the Heaven goes. The Good Book takes for granted an Earth at rest with respect to God's throne in that Heaven, and the celestial host therefore revolving around us. Details about the mechanics employed in this great design we have not been given. How its parameters are struck and the variables within it are circumscribed Genesis does not tell us. Hoyle, surveying the unending search for the "how" and "why" of the heavenly courses from the Babylonians to the twentieth century's relativists, rightly remarks "that each generation finds the universe to be stranger than the preceding generation ever conceived it to be."⁽¹⁾ For "veil after veil will lift - but there must be veil upon veil behind".⁽¹¹¹⁾ Lifting those veils - that interesting task God has granted to the sons of men to be exercised therewith, Ecclesiastes informs us. God's Message, after giving us the great outline, leaves further investigation to us.

"What should we believe, and how then should we live?" Answers given by wisdom to such questions Holy Writ offers. For evidences in the natural sciences, I agree with John Calvin, we have to turn to textbooks dealing with those matters. And when, as is the case, modern astronomy keeps our Earth still dethroned, we may confidently declare it to be wrong, but shall have to show this by means of experiments. For scientism, though knowing the heliocentric dogma to be actually overtaken by new insights, still preaches that dogma to the uninformed as a "*fact*", to be accepted as gospel truth - and this, all logically valid evidences to the contrary. But when we, who frankly trust Our Maker's lucid information "in faith", with all those evidences on our side, hold on to a Universe called into being for the sake of us here on Earth... well, then practically even the staunchest believers in an inerrant Bible shake their heads. And when asked to show me the errors of my way, about nine out of ten do not even deign me worthy of an answer. Whilst the tenth refers me to Galileo. He has, hasn't he...?

Endlessly during eighteen years I have had to repeat the truth. No, he has not "proven" the Earth to be just one of the planets circling the Sun. It is a piously adored untruth foremost among the many in the history of western mankind's beliefs and disbeliefs. That Big Lie even they unreservedly still honour, who are skeptical about the truth-content of Darwinian theory old-style and all its out of embarrassments born modern reformulations. Many of those skeptics are clearly, or at least dimly, aware of the disastrous results to which "survival of the fittest", and that slogan's concomitant philosophical theses, have led. However, for one minute

to doubt Copernican truth, after 1916 by the general theory of relativity effectively demoted to a simple illustration for the unlearned and no more - the possibility of doing that has not yet even dawned on them.

To quote a well-informed doubter, the molecular biologist Michael Denton, about the question of evolution: "The acceptance of the idea one hundred years ago initiated an intellectual revolution more significant and far reaching than even the Copernican and Newtonian revolutions in the 16th and 17th centuries:"(112) And fifty-two pages later: "It was because Darwinian theory broke man's link with God and set him adrift in a cosmos without purpose or end that its impact was so fundamental. No other intellectual revolution in modern times (with the possible exception of the Copernican) so profoundly affected the way men viewed themselves and their place in the universe.(113)

I cannot see it otherwise: when making these observations this author is running with the hare and hunting with the hounds. Starting with Darwin's *The Voyage of the Beagle* Denton titles the first chapter of his book "Genesis Rejected". I declare this to be a myopic choice. Yes, Genesis has been rejected. Yet not just by Darwin, but already by Copernicus and his self-styled prophet Galileo Galilei. The latter opened Pandora's box by brushing aside the clear information of Genesis 1:1-19. Small wonder that consequently the second half of the chapter in the long run had to suffer the same treatment. Denton comes close to realizing this when much later in his book he shows himself to be conscious of the impact that an obvious extrapolation of the basic heliocentric

scheme would have if it were confirmed. If our Earth is not a unique creation, but just a sample of numberless likewise advantageously placed planets around other "Great Lights" in their millions, and hence life were to prove widespread, then this "would of course have a very important bearing on the question how life generated on earth. For it would undoubtedly provide powerful circumstantial evidence for the traditional evolutionary scenario, enhancing enormously the credibility of the belief that the route from chemistry to life can be surmounted by simple natural processes, wherever the right conditions exist."(114) True enough, but may I reverse the direction of reasoning by asking if ever the chemical soup-to-ape fantasia would have been dreamt of in any man's philosophy on an Earth, as our ancestors from before 1543 knew it to be, at the visible Heavens' centre? Denton should remember John Donne's well-know lines written in 1611. "And new philosophy calls all in doubt.. 'Tis all in pieces, all coherence gone."(115) Then already, and not only after 1859!

Of course I agree that the dethronement did not show its inevitable corollaries immediately. A stone released to roll down a hillside has to accelerate before it can do much damage. Traditional restraints delayed the death of Adam from Newton to Darwin(116), but did not stop the decline, and today there are many thoughtful men who openly acknowledge that the emergence of Holocaust and Gulag, of racism and breakdown of ethical norms, has been fostered, if not initiated, by Darwin's monkey-to-still-evolving-monkey syndrome. God died in the 19th century, and man is dying in the 20th century", Norman Geisler, a staunch

defender of Biblical Inerrancy, declares.(117) I have no quarrel with this hyperbole: but would like to remind him of Schiller's proverbial lines:

"Truly, this is the curse of evil done:

It must go on forever bearing evil. "(118)

Why did, as Geisler sees it, God die only after the publication of *The Origin of Species* in 1859? The book merely articulated the logical outcome of a trend of thought that began to infiltrate Western man's mind once the consequences of Newton's cosmic model came to be realized. "The Divine Antifex had therefore less and less to do in the world. He did not even have to conserve it, as the world, more and more, became able to dispense with this service."(119) - thus Alexandre Koyré.

What if...?

Just meditate about it for a few minutes: what if the approach of Cardinal Bellarmine had won the day in 1633, and the Catholic Churchmen had stuck to their guns with a "Proof, please", challenging generation after generation of astronomers to provide it? "For", as Osiander had put it in his foreword to Copernicus' book, "these hypotheses need not to be true nor even probable; if they provide a calculus consistent with the observations, that alone is sufficient... the astronomer will accept above all others the one which is the easiest to grasp. The philosopher will perhaps seek the semblance of truth. But neither of them will understand or state anything certain, unless it has been divinely revealed to him...So far as hypotheses are concerned, let no one accept anything certain from astronomy, which cannot furnish it, lest he accept as the truth ideas

conceived for another purpose, and depart from this study a greater fool than when he entered it.”(130) To which words I cannot but add Hoyle's appraisal that they "agree remarkably well with the outlook of modern theoretical physics, and are not at all inept, as earlier generations have supposed.”(121)

What if Tycho Brahe's view had been more strenuously adhered to? His system "had the merit of being theoretically equivalent to the Copernican, without the apparent defect of ascribing motion to the Earth; it made possible a scientifically adequate geostatic astronomy, irrefutable by any test of observation that Galileo or anyone else could impose on it.”(122) To object that Newtonian kinematics and Kepler's laws decidedly put an end to its tenability is not warranted. Jupiter's many moons circle, obedient to all these generalizing laws, their wandering star whilst that planet in its turn just as law-abidingly describes steady orbits around the Sun. Until we have found a firm hold on space, and consequently can pinpoint absolute motion, we may put the fulcrum of the Solar System wheresoever it pleases us. Newton, fully aware of the difficulty, thought to have solved it for his mechanomorphic model by means of his well-known whirling water-filled bucket. However - as is now generally admitted - Bishop Berkeley, preempting so to say Mach and Einstein, convincingly showed that this demonstration did not settle the issue. The most and best we can do when positing a Sun immovably fixed in space is to demonstrate the Earth's 30 km/sec motion while revolving around it. So long as that has not been accomplished, Galileo may get a hearing, but no one is compelled to take him seriously.

To argue that Bradley's discovery and his

accounting for it would have provided Tychonian theorists clear evidence for that motion of the Earth is, as I have shown, an overhasty conclusion. More: if then and there after 1727 Boscovich' water-filled telescope had been utilized to test Bradley's contention, that contention would have been found wanting. The only change in the geocentric model necessitated by the outcome of the experiment would have been the one advocated in the present essay: a starry dome not hinged on the Earth but on the Sun. Any stringent reason to exchange the proven cosmic structure for an unproven heliocentric guess nobody could have postulated. Let me quote a knowledgeable, almost two centuries after Galileo not yet by the general opinion browbeaten, witness for the true theoretical situation in his days: Alexander von Humboldt (1769-1859) still declared: "I have already known a long time that we do not yet have proof for the system of Copernicus, but I shall not take the risk to be the first one attacking it.(123)

Even when a good hundred years after Bradley, three astronomers - Bessel, Henderson and Struve - detected the first parallaxes, their findings could, as is done in this essay, without difficulty be accommodated to the geocentric model. And surely the last devotees of Copernicus would have been disconcerted after *à la* Michelson and Morley, in vain having tried to vindicate their prophet. To be sure, they would have been rescued again by the ingenious *ad hoc* of Poincaré's "principle of relativity", as - utilizing Lorentz' equations - elaborated by Einstein. However, and no mistake: every logician will agree with me: that principle - and that to the detriment of its extrapolations - is no more than an *ad hoc*, not to be taken too seriously, for it explains

something by means of the very phenomenon it was invented to explain. That is: by taking, all three-dimensional data to the contrary, a whirlabout Earth for granted.

In the wistful "what if" scientific fantasia I have myself allowed the Tychonian astronomical establishment would, I envisage, have treated those erring Copernicans better than in the harsh climate of today's blinkered secularism the stargazers treat the geocentrists.

My convinced geocentrists would have been epistemologically prudent enough to forego the use of the qualification "unthinkable". They would have allowed a Sun-centered Universe, adrift or not adrift in a - let us admit it! - strict definition eluding spatiality, a logical possibility. Therefore, wanting to be true, unbiased scientists, they would have been on the lookout for any chance to test the truth of their theory. And diehard Copernicans suggesting an experiment capable of overthrowing the Earth-centered paradigm, would have immediately been granted a serious hearing and enthusiastic cooperation in performing it.

A year before and a year after Einstein burst upon the scene in 1905, a Lutheran pastor, F.E. Pasche, published books in defence of the pre-Copernican view.(124) Whether the Germania Publishing Company of Milwaukee found it a bad bargain to market these books I do not know, but that no second printing became necessary stands to reason. Yet, I find the coincidence remarkable. Geocentricity was apparently, at least among scientifically mal-adjusted German immigrant circles in Wisconsin, still alive and well on planet Earth when a German in Switzerland published a theory

aimed at destroying the last shreds of its credibility. What careful experiments had not been able to accomplish this "Zur Elektrodynamik bewegter Körper",⁽⁵²⁾ would once and for all do. For the "unthinkable" spectre, by test-results threateningly again conjured up out of the murky medieval depths of superstition, the special theory of relativity effectively, it seemed, would exorcise. Small wonder that physicists in general and astronomers in particular took to this proposal as ducks to the water. However, I doubt whether many of them sufficiently realized how this undertaking, welcomed as a panacea *par excellence* for physical theory, in fact would move the basic problem back to square one. That is to say: to the alternatives outlined by Cardinal Bellarmine in his Foscarini letter. To declare that from Einstein's point of view both Tycho Brahe's and Copernicus' models are "as good as anybody else's - but no better" is one thing - to substantiate this is another. I appreciate Hoyle's confession that after all Tychonians cannot be labeled outright fools, but it is not good enough. Before I accept Sir Fred's judgement and am constrained to pronounce myself satisfied with such an insubstantial equality, I want what is called "proof". On the prerequisites for such a proof I agree with a creationist like Robert Kofahl.⁽¹²⁵⁾ With him I concur that the quest has to be conducted in, and confined to, the empirically approachable natural world. Do I then ask too much when on these terms I challenge Hoyle, *et al.*, to authenticate their claim? By urging, nay: beseeching, them to perform the common sense extra-terrestrial, but still sublunary, measurements of the speed of light suggested in this paper? Measurements of which the

theoretical considerations suggesting them rest on a *modus tollendo tollens* that will make the outcome logically binding? And if this outcome is found to be squarely contradicting Poincaré's principle of relativity - will it not have to be admitted already a century ago to have been attested by Airy's failure?

No reasoning can start from nothingness. I here posit the perception of spatiality shared by all sentient beings as a given, beyond and above which our understanding can not truly levitate itself. Furthermore I accept the constant velocity of light (on Earth) with respect to that spatiality, whatever distinctive qualities and entities theorists may theorize both to have or hold. And then there are only far-fetched possibilities to circumvent the principle of contradiction. To make no bones about it: in the event that Einstein turns out to be wrong the Earth either is at rest in a the stars encompassing space that knows place, and consequently absolute motion, or the Earth is moving together with its tied-aether bubble. However, the spaces-moving-around-spaces postulates of the schesis theories of the type today still forwarded by Theocharis and Zappfe(39), I reject as desperate artificialities without the slightest shred of evidence supporting them that not even better fits the geocentric model. Those theories are only devised *coûte que coûte* to save Copernicus.

It is either Einstein or Tycho Brahe. And with that I rest my case!

Science and the Christian Faith

There are, and I still have to dwell on these as yet, a few non-physical but for mankind's world view crucially important facets of the issue. If indeed the positions of the Earth on the twenty-second days of June and December are in principle measurable 299.10^6 km apart, then the astronomical establishment has a formidable case. If this distance cannot be paced off because it does not exist, then its popularizers are talking through their hats and preaching a world view of a value less than null and void.

If Giordano Bruno (1548-1600) was correct in declaring the stars to be just far-away Suns, and Johannes Kepler (1571-1630) plainly wrong in denying this, then macro-evolution from a Big Bang to advanced anthropoids fabricating Big Bombs acquires by implication and extrapolation an attractive probability. There is then the immense Cosmos of so and so many billions of years and miles with uncountable galaxies harbouring numberless varieties of stars and nebulae, all these without any truly apprehensible system scattered through the unbounded Heavens. Somewhere in an out-of-the way corner of that Universe on a cooling speck of star dust circling a minor fireball we live our lives, from now on as by benevolent chance not aborted younger than five-month fetuses, to certain death and decomposition. Whence it all came, why we are there, and how everything will end or be recycled - we shall never know. For who, after accepting the Universe preached by the Sagans and Goulds, can without mindwrenching rational contortions still believe in a Bible that already begins its message with a make-believe story of an in six days completed creation of an unique Earth?

Clearly: Genesis 1:1-19 is strangely without rhyme or reason when its account is compared with the after the Copernican Revolution obtained "facts". And strangest of all are the rear-guard skirmishes of creationists staunchly believing the literal truth of the Biblical report, but only from Genesis 1:20 on. In one respect I cannot blame them: from their tenderest years on they have been bamboozled into believing Galileo to have been a scientific prophet without peer. A five-year old grandson of mine, for instance, attending a (Christian) kindergarten came up to me the other day and took me to task about the error he has heard his father and me talking about. "Grandpa", he remonstrated, "teacher says that the Earth goes around the Sun." Yes, and two plus two equals four - never doubt it!

Therefore only after reading the opening verses of the Bible as interpreted and elucidated by the wisdom of the world, do the protagonists of a strictly orthodox six-day creation abound in fervent testimonies about the ingenuous matter-of-fact manner Moses has employed in narrating to them the happenings during the Hexamaeron's days five and six. And rare are the orthodox theologians who realize that by taking such an approach to the plain text of Scripture they are halting between two opinions. Forgetting how "the exegete must explain what is written and restrict himself to that"(126) they go to work by the light of questionable information from science. By means of introducing poetical hyperboles, sleight of hand glosses, doubtful comparisons, and by applying desperate scientific *ad hoc*s, they delude themselves into believing that thereby they have God's report of His doings effectively cramped on the passe-partout of secular astrophysics.

Why does standard-creationism play this risky game? If "the things that natural science is positing lie hidden in or behind the simple childish language of Genesis One"(127), why then this "childish" - where are we told that is the case? - restricted to the first half of the Revelation's first chapter and not applied to the second half? "The Lord means what he says, and says what He means." If this adage does not apply to the beginning of the Torah , where remains then our certainty that the rest of Scripture is plain truth? Time and again, in the New Testament as well as in the Old, the authors refer to Genesis as a trustworthy historical text. Nowhere, neither in the Bible's first ten chapters, nor in all that follows, do we find the slightest hint or warning that the information about the creation of Heaven and Earth, of Sun, Moon, and the stars also, must not be taken as an eyewitness' report just as straightforwardly as that of the creation of man and beast.

If the proponents of modern astronomy have hit the mark I can see how Biblical Christianity may well appear to them as a soothing syrup for incurable parochial minds. As a faith by analogy equal to the tribal religion of an untutored people, not yet touched by civilization, among whom in days of old a few wise souls concluded that for the purpose of keeping societal life on an even keel a with divine authority festooned ethics and a "pie in the sky" are practical necessities. For myself, if in the matter here at stake I am wrong and the modern picture of the Heavens will turn out to be incontrovertibly established... well, I shall hold the faith, but will also realize that the world with David Hume (1711-1776) may well characterize that faith to be "some unaccountable operation of the mind between disbelief

and conviction, but approaching much nearer to the former than to the latter."(128) However, to quote Pascal for the last time: the heart has its reasons that reason knows nothing of.

It has, happily, not yet come to that. Of the believers in the ruling varieties of cosmological models, all of them are bound to admit that the cornerstone of their imposing theoretical edifices - the Earth's motion - is on their own acquiescence not testable. Over and against this I have shown the scheme of Tycho Brahe - adapted to the "aberration" only having become observable many years after his death - to be easily testable. Hence I refuse until further notice to renounce the conviction of that cantankerous Dane with his partly silver nose. Until, that is, the experiment I insist on shall - be sure: it will not! - have given a result putting me in the wrong.

With due apology for harping on a final aspect of the epistemological string I have been twanging again and again: there is still an important consideration not to be passed over or brushed aside. Even if the genuineness of the geocentric theory were to be warranted by the facts, the Goulds and Asimovs of our age, I realize, would not be put out of countenance in the least. They might grant us the probable or apparent existence of a Something or Someone, an Intelligence acting in and through the Intelligent Universe.(129) Yet, trying to clinch my case by pointing a Hoyle, a Jastrow, and all their variegated compatriots to that analogy of Archdeacon Paley's watchmaker will not make Christians of these sincere seekers for supra-sensible truth. They may well with the Athenians of St. Paul's day become theists paying homage to an Unknown God, to a Maker, but nothing more - if even that much! For when said

Archdeacon finds a watch on crossing a heath(130), he may indeed infer that this object has been produced by a watchmaker, because he has seen, or has been told by trustworthy witnesses, that watchmakers design and fabricate such timepieces. However: analogies, I must agree with Hume, are not very compelling arguments. A watch is not exactly a Universe, and who has ever noticed a Creator creating Universes? Furthermore: whether the nowhere to be seen artisan who made the watch in case is a scoundrel or a saint - Paley cannot conclude that from his find. Only after using it for a few days he will be able to tell us whether the maker is an excellent craftsman or a clumsy niggler.

From the day of Cicero's *De Natura Deorum* to Hume's *Dialogues Concerning Natural Religion*, and until the end of our time and age, these defects always did and always will greatly diminish the force of the argument from design as a tool in Christian apologetics, which above all has to account for the origin of evil - a task natural theology is unable convincingly to tackle. Grant the Omnipotent and Greatest of all Watchmakers high up there in the sky the creation of those constructs built of subatomic particles everywhere around us, together with our sensorial ability to transform these aggregates of quarks into collective representations, that is: into the things we see. Yet, looking at His handiworks here below, the secularists will say that in any case He has bungled the job. That this *prima facie* seems to be true, I do not, as already said, deny. Disastrous "Acts of God" in nature, terminal cancer wards in hospitals, devilish deeds, hatred, famines, poisonous snakes, malformed babies - what loving Great Father would subject His children to such calamities, which by

definition He should be powerful enough to ward off? And even more to the point: consider the twentythousand *plus* Christian denominations, each of them claiming to be right with regard to the doctrines on which all the other ones are wrong. It appears that His Spirit is not even strong enough to keep His disciples in line. A real benevolent all-wise and all-powerful Divinity ought to do better!

Agreed - again at first sight, that is. But the first cue to a worthier and less hasty appraisal the atheists and questioning theists have in that "ought".(131) For from where do we get, if not from a moral Maker, this standard that *a priori* enables us to be sure what "ought" and "ought not" to be the case? Around us and in us, our thoughts accusing or else excusing God and one another, and our own selves? Are there not even pains and deprivations we gladly suffer for a desirable purpose? What, as Thomas Hardy heard Nature ask, if "some high Plan betides, as yet not understood, of evil stormed by good?" What if He, Who knows the end from the beginning, needed the presently damaged Creation as a necessary prelude and probation for the Golden Age to come? What, as from Thomas Aquinas to our days many good and wise men have maintained, the world that now is must be the best possible way to achieve the best possible world into which we shall be resurrected by a God, Who is love? When Hardy, in the line following the one just quoted, deems us to be "the Forlorn Hope over which Achievement strides", he is wrong. We are not expendable pawns in an unknowable Great Game, but precious in the sight of God.

Castles in Spain, dim-witted daydreams? I think not. However to expound the severe rationality of that

"way", as the Bible calls it, is to engage in a theodicy. And to repeat a remark already made: such a theodicy is a subject too high for a paper which, when all is said and done, merely pleads the desirability of a tentative this-worldly step aimed at underscoring the credibility of a Great Plan. That which may be known of God, His eternal power and Godhead, is manifest in us and understood by the things that are made. His Great Plan we have to believe until it shall be revealed at its completion.

So far as the philosophical and religious aspects of the issue are concerned, which - sound reason will acknowledge - cannot be solved by reason. On the other hand I ask the reader to realize: Christianity is not only what outsiders might well conclude it to be from observing the antics of the electronic soul-savers among my brethren in the faith.

Conclusively...

Not worthy of any serious refutation? I am aware that this will be the verdict of virtually all readers who have taken the trouble to follow me thus far in my defense of Tycho Brahe. Well, to lecture me must therefore be easy for them. Just let them present me with one astronomical observation that physically and logically gives short shift to my thesis, and I shall retract every word I have said. However, to save those readers fruitless efforts, let me - and this together with the truly prominent pundits in the fields of science and philosophy! - warn them that such an observation cannot be found. At bottom it is my implicit medieval credulity against their equally credulous faith in the scientific method. And that is a controversy not susceptible to proof, *pro* or *contra*.

Allow me, as far as provability is concerned, to summarize the whole matter. First of all: nobody can deny that at the end of the 19th century the Newtonian view of the cosmos was in dire straits, and that ultimately only Einstein rescued astronomy out of the Ptolemaic *cul-de-sac* into which it had reasoned itself. However, as I have shown, that great man's ingenious theories are not only inadmissibly tainted by a metaphysical stance, but also scientifically suspect by reason of two elementary logical fallacies. From the circumstance that here on Earth we cannot detect motion relative to space it does not follow that such is nowhere possible. I note in passing that L. Essen challenges the "common view that the special theory of relativity is well supported by experimental evidence, although this may not be true of the general theory".(132) More importantly: I consider the sad actuality that all this evidence is obtained by affirming the consequent and is therefore not in the least compelling. "If relativity is true we shall be doing *this* to obtain *that* . Here is the *that*, and therefore..." Fiddlesticks. There may be a quite different phenomenon behind that outcome. Last but not least, I hold that the general theory, as I have demonstrated, is in its present form untenable. Looking at the star *Alpha Centauri* from an Earth circling the Sun, parallax measurements and trigonometry would assure us that the two are 1.3 parsecs, or more than 4.2 light years apart. But looking from an Earth circled by the Sun, the distance turns out to be less than one twenty-fifth of that amount. Now these values cannot both be true, and the theory's assertion that the second view is as good as the first, but not better, is consequently wrong.

The desirability of a test is thereby certainly even

more stressed, because it will logically and physically settle the matter. If a suitable modification of either Hoek's experiment performed in 1868 or that proposed by me in 1968 produces a null result, Einstein will at last be acceptably verified. For the reasoning behind these proposals is *modus tollendo tollens* and therefore logically binding. On the other hand: if the result will be positive and the observed interference consistent with the speed of the used apparatus, then space knows proper place and movement real rest.

Yet will it settle the matter, logically and physically?... *Russell's Caveat*, re-worded in a form he would have scorned, must have the last word.

"Saving the appearances", that is promoting a plausible guess at what we prefer, or believe to be, the truth behind the veil of the observations we are wont to call "facts" - it is a game we can all play to our hearts' content. And astronomers, judging from their papers, enjoy it to the full.(88) However, without subsequent verification our guesses are no more than doubtful desiderata, as yet binding no one.

For this-worldly science careful testing of all theories is a *sine qua non*. Whether we build our models of the Universe on sacred or secular *givens*, our ideas remain tentative until duly verified. But even the most solid experimental affirmations and the failure of all efforts at falsification do not, I maintain, provide us with a final, a definite answer to the question how the Heavens go. Our experimental set-ups may be impeccable and our reasoning logically faultless - a not yet realized aspect of the natural world may one day come to the fore and upset our tidy schemes. It has happened time after time, and who can guarantee that it will not happen again?

Is it therefore impossible to declare any model of the cosmos truly true? Is there not any unassailable logical reasoning or physical observation compelling us to prefer in astronomy one postulate above all the other ones put forward and believed in throughout human history? No, there is not. Man sees what he wants to see, but cannot prove his view to be correct. As Meno put it to Socrates: if you do not already know which view is the true one, "even if you come right up against it, how will you know that what you have found is the thing you didn't know?"

Socrates rebuttal of this argument is revealing: he has to fall back on "men and women who understand the truth of religion."(133) Precisely so: only a metaphysical message from a Bystander, for Whom alone the cosmos is an object not participated in, will give short shift to an otherwise endless theorizing. I unconditionally accept such a metaphysical input - the same that Tycho Brahe decided to believe in. Assuredly nobody can possibly do more than decide what to believe. And *Homo Sapiens* should not forget to realize that he may not have come to whatever decision he takes uninfluenced by and independently from everything else. For his mental make-up and logical capacity he has not himself created out of nothing - he acquired it somehow from somewhere.

Let me repeat: I reject any effort to drag the Bible into court as a scientific textbook. To do that is to demean its character. However, Genesis chronicles, as many myths profess to do, how Earth and man came into existence and degenerated into their present fallen state. And this with a self-evident authority, not mincing matters. As George Roche remarks: "We may think of

Genesis as fanciful, but next to all other creation myths it is as prosaic as a newspaper report"⁽¹³⁴⁾

I agree: there is neither the slightest mythical, nor any scientific or theoretical flavour to the commonplace language Moses employs. And this prosaic, plain, factual report I believe. The Earth has no equal in the space around us, created as she was in the beginning, with only from the fourth day on Sun, Moon, and stars beginning to orbit her for signs, seasons, and days. The inspired text does not contain any hint that thereby the Earth was degraded to one of a set of specks of matter circling a minor star. Whatever astronomers assert to the contrary, they will never be able convincingly to demonstrate this downfall to have happened.

To repeat: I believe and *ergo* know - particulars subject to further investigation - that the Tychonian view is the true one. But I admit, as already said, that an outcome of my experiment favouring this view will not verify it absolutely. Even holding this outcome to be theoretically and practically untouchable won't help, for such a positive evaluation of the result also brings grist to the mill of all Stokes-type theories. On the other hand: if the test will affirm Einstein's hypothesis, then this just as well keeps a number of anti-relativistic theories in the running. In short: whatever the data acquired by any experiment: those who use these data to bolster their proposals will do well to attach a "maybe" rider.

I do not want anyone to be in doubt about my rock-bottom position on this vexing, insuperable last-ditch issue. Evidences in support of my geocentric theory may come forward and multiply. However, I do not build my conviction on any or many affirmative data. We - "on our own" - cannot and never shall absolutely

"know" astronomy. Or to reformulate *Russell's Caveat* : without accepting Divine input, the queen of the sciences, and all the other sciences also, will forever remain bereft of ultimates.

That input we have, and it being metaphysically qualified is surely not subject to verification. Take it, or leave it!

Even verifications have to be verified, and this in the nature of things here below *ad infinitum* . Bradley's discovery of aberration "verified" Newton's heliocentric theory in the eyes of virtually all his contemporaries, and Berkeley's objections were brushed aside. But when Airy, already doubtful of the outcome, decided to verify Bradley's verification he got nowhere. That verification, courtesy of Fresnel, was taken to "verify" the obvious: either we move relative to the stars or the stars relative to us. *Pro* or *contra* Copernicus, it was decided, it had substantially nothing to say. What it, and also the Michelson and Morley result, did was to throw doubt on Newton's neat and tidy model, and in doing that pave the way for Einstein's theories. Now, A.D. 1988, astronomy lives by the grace of relativity, but is that relativity truly verified by experiments? "Yes", say the modern equivalents of the Newtonian know-alls. "No", retort the Berkeleyans of today, and mightily they labour to produce verifications of their dissection of those relativistic verifications.(75)

The matter reminds one of a well-know line from Juvenal's *Satires*: "Sed quis custodiet ipsos Custodes?" - But who is to guard the guardians themselves?" Whichever way we turn, we cannot escape an infinite regress. Who verifies our verifications?

That this essay will be judged to be overly

repetitive I realize. I confess: it is even purposely so. That many questions remain I do not deny. But to answer these before the central thesis here defended has been vindicated would be premature. For almost twenty years of debate and of discussing the Tychonian theory have taught me that many, if not most, people need time and reflection fully to grasp the crucial importance of the atheist *Russell's Caveat* and the Christian *Armstrong's Alert* when contemplating the question "how the Heavens go".

When C.S. Lewis tells us that his lifelong friend, Owen Barfield, "has read all the right books and has got the wrong thing out of everyone"(135), then I must on a number of important issues agree with him. Yet when in a closely reasoned thesis about mankind's relation to science and God, Barfield castigates our mechano-morphical "new science" outlook, I think he says things relevant to the geocentric approach in astronomy put forward by the present essay.

The modern worldview reducing us to ephemeral objects among objects, to conglomerates of quarks and no more, with at best allowing a distant God in a mode of being not unlike our own... "if incalculable disaster is to be avoided"(136), a re-awakening will have to be brought about of the medieval conception, realizing man to be a microcosmos embedded in the macrocosmos surrounding him. And not only that: the God beyond and above all sensory approach and yet closer to us than our own selves will have to be adored and honoured in every man's doing. As St. Paul A.D. 51 told the Epicureans and Stoics of Athens; "For in Him we live, and move, and have our being". In Him, Who has revealed Himself by the Incarnation of the *Logos*, the Word."

A reviewer of my Dutch book *Houvast aan het Hemelruim* (A Hold on the Spacious Heavens), published in 1985, writes that he has "learned from history that we must place not too much confidence in the 'findings' of scientists, including those of Galileo". Therefore he gives me "the benefit as well as the disadvantage of the doubt". And after confessing that he would be very surprised if I were right, he adds: "I almost hope he is right. It makes me feel a little bit more secure as a universe dweller to know that the Earth is at the centre."(137)

My reviewer does not almost have to hope this. That the Earth, created in the beginning, hangs immovably upon nothing in space, God's Revelation considers this for granted. Therefore science cannot disprove this fact, and truly sagacious astronomers, whatever the ontological stance they prefer, very well know that a logically sound refutation of geocentricity is anyway unattainable.

During the night before October 24, Anno Domini 1601, Tycho Brahe, lying on his deathbed, was frequently heard to exclaim that he hoped he should not have lived in vain.(138) He has not: that obstreperous Dane was on the right track! Airy's Failure to discredit geocentricity has shown this for all to see!

Deprive modern cosmology of the certainty of its mathematical underpinnings - then there is not much solidity left. "Now Gödel's incompleteness theorem", thus Stanley L. Jaki, "states that the proof of consistency of any non-trivial set of mathematical axioms can be found only outside that set, and in that sense no mathematical system can be an ultimate system... The mental road to the extracosmic Absolute remains therefore fully open".(139)

Tycho Brahe refused to leave that road in his cosmological considerations. His help he found - as I do! - in the name of the LORD, Who made Heaven and Earth.

PSALM XCII, DOMINUS REGNAVIT

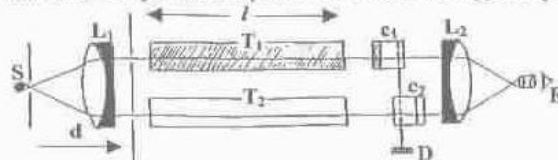
The LORD reigneth,
 he is clothed with majesty:
the LORD is clothed with strength,
 wherewith he hath girded himself:
the world also is stablished,
 that it cannot be moved.
Thy throne is established of old:
 thou art from everlasting.
The floods have lifted up, O LORD,
 the floods have lifted up their voice,
 the floods lift up their waves.
The LORD on high is mightier
 than the noise of many waters, yea
than the mighty waves of the sea.
Thy testimonies are very sure:
 holiness becometh thine house,
 O LORD. for ever.

Addenda

I. Simple First-Order Test of Special Relativity

Since the improved version of my experiment, used when in April 1982 we performed it, is copyrighted by the *American Journal of Physics* (Jan.1985, Vol.53, pp.43-45), I can only reproduce my original proposal of 1968 here in its 1972 form.

Outline of Uncomplicated Experiment to Test Isotropy of Space



Place, e.g., a Rayleigh Refractometer, T_1 , filled with fluid with index of refraction n ; T_2 empty, in a north-south position. Adjust and read dial D . The time lag between the arrival of the beams is

$$t_1 = \frac{ln}{c} - \frac{l}{c} = \frac{l(n-1)}{c} \text{ sec}$$

Turn the refractometer 90° : beams travelling east-west. If an "ether drift" exists, the time lag will be

$$t_2 = \frac{ln}{c+d} - \frac{l}{c+d} = \frac{l(n-1)}{c+d} \text{ sec}$$

The difference then amounts to

$$t_1 - t_2 = \frac{l(n-1)}{c} - \frac{l(n-1)}{c+d} = l(n-1) \frac{d}{c^2 + cd} \text{ sec}$$

If an apparent change of refractive index is observed, d can be accurately calculated; if no change is noticeable, the isotropy of space will be confirmed in a less ambiguous way than this, as done by D.C.Champeney, *et al* (1963), whose test results L.Essen (*The Special Theory of Relativity*, Clarendon Press, 1971, pp.22-23) does not consider to be decisive.

For the benefit of math-phobes I add a *Gedankenexperiment* that will, I suppose, convey the basic idea behind this outline.

Imagine two airplanes, A and B, flying past us on a windless day, first north-south and after that east-west. We measure their speeds relative to us and both times find these to be 300 and 225 km/hr. The ratio between those two velocities is therefore 4/3. And this confirms what we know already: we are at rest. Next we station ourselves on a flat car of a slowly moving east-west train and ask the pilots of the planes to repeat those two performances. That during their north-south flight they must pass us slightly off course we may neglect. However, when the planes roar past parallel to the railroad tracks we find the ratio between their velocities to be 296/221. Question: what is the speed of our train? Remembering that for the first two fly-pasts the ratio was 4/3, we easily find the answer:

$$\frac{4}{3} = \frac{300}{225} = \frac{296 + 4}{221 + 4}$$

Hence our train rolls at 4 km/hr.

In the real experiment the air becomes space, the two ray rays of light, the one traveling through an empty tube, the other through a tube filled with water, the flat-car a space satellite or fast aircraft.

The first earth-bound test we have performed and it showed an Earth absolutely at rest in space. The second we would like to see performed. If then the ratio between the velocities of the two rays (observable by a change of the light fringes) still turns out to be the same, the STR will have been vindicated. If the fringe pattern agrees with the speed of the satellite, that theory has been falsified, and the geocentric theory strongly favoured.

Hoek's **1868** experiment will serve too. But it observes, as in the Michelson and Morley trial, two

returning rays, and that will evoke (viz. the enormous literature on the particular of that M. and M. probe) endless theoretical considerations and evaluations.

II. Galileo and the Church of Rome

(Reprinted from Bulletin of Tychoonian Society, no.35-36, Jan.-Aug. 1983)

Whether a rehabilitation of Galileo will have been promulgated by the Vatican, and if so what form it will have taken, are questions without answer at the moment I am writing these lines. There are, however, straws in the wind that presage possibilities. One of these straws is a speech which the Pope, on May 9 of this year(1983), delivered to an audience of almost 200 scientists, among them 33 Nobel laureates and 22 cardinals in the Sala Regia of the Apostolic Palace in Rome.

To reproduce a translation of the complete French text, which recently has come in my possession through the kind offices of the Curia's Secretariat for Unbelievers, would demand too much of the Bulletin's cramped space and also be largely outside its scope. Suffice it here to quote the appraisal of *Nature* in the issue of May 12, 1983. The critic, Robert Walgate, called it "a most cautious and uncommitted speech on the subject", and "a piece of classic prevarication - no doubt enforced by ultra-conservative elements in the Church." I can understand why Walgate gives these grudging comments, for the Pontiff's words indeed do not strongly prejudge the issue. They still offer a ray of hope that the secular sciences will be shown the place where they belong: barely above the "raw" phenomena, but light-years lower than Divine Revelation.

Though John Paul's oration contains a carefully worded paean on the sciences and a vaguely phrased

apology from the side of the Roman Church - it stops short of specifics, and must almost certainly have irritated many of the zealots for Galileo's vindication among his audience. The convener of the meeting, Professor Antonino Zichichi, so concludes, for instance, the clearly disappointed *Nature*, "will have to continue longer with his efforts to persuade the Church finally to rehabilitate the 'father of science'".

I of course hope that Zichichi will never succeed in those efforts. And to hope this is, it seems to me, not hopeless. For almost at the end of his discourse the Pope put a restriction on what he called science's "admirable task." "To be sure," he told his hearers, "your specialization imposes on you indispensable rules and limitations in your investigations, but let outside these epistemological boundaries the inclination of your spirit carry you to the universal and the absolute."

It is this sentence which compelled me to send Karol Wojtyla, Bishop of Rome, the following letter.

Pitt Meadows, September 30, **1983**

Your Excellency:

Only recently I have been able to study the complete text of your speech of May 9, **1983** about the Galileo affair. A critic in the scientific periodical *Nature* of May 12 called it "a piece of classic prevarication", a sentiment, which from his point of view I can understand, but do not share. Quite the contrary. For, unless I completely misunderstand the closing paragraph of your oration, I conclude from your

mentioning the epistemological boundaries set to science and research that you, in concord with the instrumentalist views of, *e.g.* Thomas Aquinas, Robert Bellarmine, Pierre Duhem and virtually all modern philosophers of science, quietly wanted to remind and to warn your audience that at bottom the Galilei case is not a physical but a philosophical dispute. For the proud and myopic scientific realism of the Newtonian period with its "Science has proven that..." is not only lingering on among laymen, but also among the learned cadres of today, notwithstanding the devastating criticisms of a Sir Karl Popper, a Kurt Gödel, and their numerous disciples everywhere.

Man will "on his own" never reach absolute truth. However rationally and emotionally compelling a scientific theory "saves the appearances", there may be a better one that research has not yet stumbled on - to this appraisal by the sages of the ages the modern philosophy of science happily again has returned.

You are undoubtedly aware that according to the prevailing Einsteinian adage the pre-Copernican viewpoint, to quote Sir Fred Hoyle, is "as good as anyone else's - but no better", all motion at the present held to be relative in a finite but unbounded Universe of which the circumference is nowhere and the centre everywhere. Inevitably however, any discussion about motion assumes a shared preconception of rest. Or, as the late philosopher of knowledge, Polanyi, with admirable candor, formulates it: "every object we perceive is set off by us *instinctively* against a background which is taken to be at rest".

Overlooking the obvious question whether astronomical statements procured on such a sub-logical

basis should ever be seriously considered, Christians, surely, have no need to build their cosmology on an instinctive, unverifiable notion. They believe, and therefore know, that there exists a higher mode of being than the one in which they temporarily find themselves alive, and that only observed from that mode, from the Great White Throne of Almighty God, the last Word about absolute motion and absolute rest can be *ex cathedra* proclaimed. And has been proclaimed!

During the first sixteen centuries of the Ecclesia Christi, she, on authority of the Divine Revelation entrusted to her, held on to an unmoved Earth hung upon nothing in the centre of the observable Universe, the unaided senses of all men daily attesting to the veracity of this proposition. Be it since **1822** hushed up, officially this is still your Church's position. And I submit that there is not the slightest need for her to change this traditional attitude. Empirical science has no voice in the matter, since, says the late atheist Bertrand Russell, it "ought not to contain a metaphysical assumption which can never be proved or disproved, by observation - and no observations can distinguish the rotation of the earth from the revolution of the heavens".

On the immanent level Galilei was not completely wrong but only relatively right. Imagine the Earth as seen from the Sun, then she indeed revolves around it. Seen from the Earth it is contrariwise the Sun that runs the annual course Copernicus assigned to us. Their motions are relative, and the irony of ironies certainly is that in Galileo's *Dialogue* not super-clever Salviati but simpleton Simplicio, during the discussion about revolving sunspots, states this simple truth on which Einstein could build his theories!

Much more could be adduced, on the transcendent as well as on the immanent, exegetical, and scientific levels, to clinch the case for the ultimately geocentric position that your Church has not yet abandoned. I am sure that you are aware of those data, (comprehensively discussed in the Bulletins of the Tychoian Society, which, if so desired, I shall be happy to send you).

In **1633** your predecessor was right in condemning Galilei's unproven assertion, but the Church he unnecessarily exposed to the ridicule of men attempting to know what cannot be known, but only believed on the authority of Him, Who cannot lie. Wiser would have been to dismiss the affair and to cut it down to size by flatly stating that she had - and still has! - more important things to do than busying herself with time-bound scientific theories that come and go *ad infinitum*. Andrew Dickson White's notorious *History of the Warfare of Science with Theology* could then not have been written, and today the sagacity of such a stance would begin to compel the grudging respect due to it among those again wise enough to realize that the truth behind the veil of the facts - that is behind our perceptions of reality, the only things we have - cannot be unveiled, but only revealed - if He is there! - by the God, Who created those facts and the laws of the modes in which they appear to us. None of mankind's "proofs", not even in mathematics, finally touch bottom in the infinite. As Annie Dillard recently put it in a marvelous metaphor which, I am sure, you will appreciate: "I think science works the way a tightrope walker works: by not looking at its feet As soon as it looks at its feet it realizes it is operating in midair."

Allow me to end with Bellarmine: only if not - as still is the case - by means of an invalid *modus ponendo ponens*, but experimentally it would be demonstrated that the Earth, moving through space, circles the Sun, "then it would be necessary to proceed with great caution in explaining the passages of Scripture, which seemed contrary, and we would rather have to say that we did not understand them than to say that something was false, which has been demonstrated."

Until today that required hard-nosed and logically impeccable demonstration has not been given, and is according to the ruling theory impossible to give. Why then should the Bible have to buckle under the weight of an hypothesis about a motion that cannot be shown to be a motion?

With the prayer that He, Who created the Universe and Who is the only One for Whom this Universe is truly an object, may prevent you from judging the fallible word of man more trustworthy than His Infallible Word, I remain,

With due respect,

W. van der Kamp

In this letter I have restricted myself to the logical point at issue. The Bulletin cannot tackle the frightful complexity of all that is at stake in the matter which the *Secretariat for Unbelievers* and its advisors have to settle. Only a few remarks I allow myself.

I shall be the last to deny that the sciences have improved the human condition. But whether *sub specie*

aeternitatis, the ledger shows a credit balance? Interpreting Scripture with the insights we owe to post-Copernican research, the Bible is supposed to reveal to us that God Almighty needed not six days, but six or more billion years to produce people who, after about six thousand years of steadily progressing civilization, now are capable of destroying themselves and their world. For the Day of Judgment, warningly foretold in God's Word, secular science also has a more pleasing substitute. Read a Jastrow and his compatriots: if humanity will take its marching orders from trustworthy scientific prophesy it may confidently expect a glorious future and a kind of immortality in the extra-terrestrial conquests of its computer-programmed descendants.

Does the Pope really expect a harvest for Heaven from cooperation with these men? Does he think that by throwing St. Bellarmine to the wolves they will become sheep flocking to his Church - urging their followers to follow them and to accept all those unscientific "essentials of the faith"?

The spirit of Vatican II was supposed to work great things. Indeed it did. Exactly what has happened to the "liberalizing" major Protestant denominations now happens to the Roman Church: its adherents leave in droves, its seminaries lack the necessary novices, its schools are closing, its priests preach higher criticism. Rehabilitation of Galileo - John Paul II must be blinded not to see this - will only accelerate this trend. Not reverse it!

Nobody can reasonably expect from a Calvinist that he would mourn if the believers who turn their backs on "modern" Catholicism would join one of the smaller "fundamentalist" denominations that still hold fairly fast

to the traditions delivered to them. These believers will not, I am afraid. But if they did: how many among those groups are not infected by evolutionism, that latest pernicious consequence of the Copernican turn-about? And among those churches that still resolutely reject Darwinism - how many dare to face the worldly ridicule awaiting them for proclaiming with the Psalmist an Earth that cannot be moved?

v.d.K.

Notes

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Owen Barfield, *Saving the Appearances*. New York, Harcourt Brace & World, Inc., Harbinger Book, p.164.
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5. Michael Polanyi, *Personal Knowledge*. New York Harper & Row, 1964, p. 12.
6. C.S. Lewis, *The Abolition of Man*. London, Geoffrey Bles, 1956, p.26.
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17. Morris R. Cohen and Ernest Nagel, *An Introduction to Logic*. New York, Harcourt, Brace & World, 1962, p.98.
18. van der Waals, *Wereldaether*. p.74.
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24. A.C.S. van Heel and C.H.F. Velzel, *What is Light*. New York, McGraw-Hill, 1968, pp.179-180.
25. van der Waals, *Wereldaether*. pp. 78~80.
26. *Ibid.* p.81.
27. Francis A. Jenkins and Harvey E. White, *Fundamentals of Optics*. New York, McGraw-Hill, 1957, p.397.
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30. van Heel and Velzel, *What is Light*. pp.180-181.

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| Experimental Basis for Theory of Special Relativity | | | | | | | |
|---|----------------------------------|----------------------------------|-------------------------------------|-------------------|-----------|------------|------------------------|
| | Ether Theories | | | Emission Theories | | | |
| | Stationary ether, no contraction | Stationary ether, Lorentz contr. | Ether attached to ponderable bodies | Original Source | Ballistic | New Source | Special Theory of Rel. |
| Light Propagation Experiments | | | | | | | |
| Aberration | A | A | D | A | A | A | A |
| Fizeau convection coefficient | A | A | D | A | A | A | A |
| Michelson-Morley | D | A | A | A | A | A | A |
| Kennedy-Thorndike | D | D | A | A | A | A | A |
| Moving sources & mirrors | A | A | A | A | D | D | A |
| De Sitter spectroscopic binaries | A | A | A | D | D | D | A |
| Michelson-Morley, using sunlight | D | D | A | D | D | D | A |
| Experiments From Other Fields | | | | | | | |
| Variation of mass with velocity | D | A | D | N | N | N | A |
| General mass-energy equivalence | N | N | N | N | N | N | A |
| Radiation from moving charges | A | A | N | D | D | D | A |
| Meson decay at high velocity | N | N | N | N | N | N | A |
| Trouton-Noble | D | A | A | N | N | N | A |
| Unipolar induction using permanent magnet | D | D | N | N | N | N | A |
| Legend: A, the theory agrees with the experimental results D, the theory disagrees with the experimental results. N, the theory is not applicable to the experiment | | | | | | | |

48. Carl A. Zapffe, *Seven Short Essays*, privately published at Brainerd, Minn, U.S.A., p. 46.
 T. S. Theocharis, *A Genuine Test of the Principle of Relativity*, *Bulletin of the Tychonian Society*, March - May 1980, n. 28, pp. 23-28.
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50. Anthony Standen. *Science is a Sacred Cow*. p.73.
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62. Albert Einstein, Geometry and Experience, in *Sidelights on Relativity*. New York, Dover Publications, 1983, p.30.
63. *Ibid*, pp.23-24.
64. Gardner, *Relativity Explosion*. p.185.
65. Blaise Pascal, *Pensées*, IV: 277, VII: 553.

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I only stand behind "A. The Galilean Transformation". Unhappily, Dr. Byl's "B. Fresnel Drag" contains an error also made by H.Aspsden (Phys. letters, 85A, 411, 1981), who is proposing the use of a solid glass tube, which we in 1982 already found to be unworkable.

Also see relevant articles in the Bulletin of the Tychonian Society

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69. *Ibid, Copernicus, p.1.*
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73. C.S. Lewis, *The Discarded Image*. Cambridge, University Press,1964, pp.216-222.
74. James M. Boice, "God and History", in Kenneth S. Kantzer, editor, *Applying the Scriptures*. Zondervan, Grand Rapids, 1987, p.507.
75. J.P. Wesley, editor, *Progress in Space~Time Physics*. 1987 Blumber, West Germany, Benjamin Wesley - Publisher.
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77. Fred Hoyle, *Astronomy & Cosmology*, pp.4647.
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82. Walter van der Kamp, *Houvast aan het hemelruim*. Kampen J. H. Kok, 1985, p.105.
83. Abell, *Exporation* p. 126.
84. See, e.g. John Warwick Montgomery, "Law and Justice" in Kenneth S. Kantzer *Applying the Scriptures*, p.299-314.
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86. Alexandre Koyré, *From the Closed World to the Infinite Universe*. Baltimore, The Johns Hopkins Press, 1968, p.276.
87. Burke, *The Day the Universe Changed*. p.11.
88. W.R. Corliss, *Stars: Galaxies. Cosmos*. Sourcebook Project, P.O. Box 107, Glen Arm, Md, 21057.
89. See, e.g., E.W. Bullinger, *The Witness of the Stars*, Grand Rapids, Kregel Publications, 1974, Joseph A. Seiss, *The Gospel in the Stars*, Grand Rapids, Kregel, Henry M. Morris, *Many Infallible Proofs*, San Diego, Creation Life Publishers, 1975, pp.334-343, Ben Adam, *Astrology. the Ancient Conspiracy*, Minneapolis, Bethany Fellowship, 1963.
90. Pierre Prevost, *Traité de Physique Mécanique de Georges-Louis Le Sage*, Deux Traités de Physique Mécanique, Geneve, J.J. Paschoud, 1818.

Also see the following treatises:

L. W. Austin and Charles B. Tuwing, *An Experimental Research on*

- Gravitational Permeability*, Physical Review, Vol.5, 1897, pp.294-300.
- Q.Majorama, *Theoretical and Experimental Researches on Gravitation*, Philosophical Magazine Vol.39, 1920, pp.422-504.
- Maurice F. C. Allais, *Should the Laws of Gravitation Be Reconsidered?*, Aerospace Engineering, Vol.18, Sept.1959, pp. 46-52.
- Erwin J. Saxl and Mildred Allen, *1970 Solar Eclipse as "Seen" by a Torsion Pendulum*, Physical Review D: Vol. 3, No.3, 1971,pp.823-825.
- Daniel R. Long, *Why do we believe Newtonian Gravitation at Laboratory Dimensions?*, Physical Review D: Vol.9, No.4, 1974, pp.850~852; *Producing an Ultrahigh-Uniformity Gravitational Field*, Vol.10, No.6, 1974, pp. 1677-1680; *Experimental Examination of the Gravitational Inverse Square Law*, Nature Vol.260, April 1976, pp.417-418.
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The Tychonian Society

The Tychonian Society holds that the only absolutely trustworthy information about origin and purpose of all that exists and happens is given by God, our Creator and Redeemer, in His infallible Word, the Bible. All scientific endeavour which does not accept this Revelation from on High without any reservations, literary, philosophical or whatsoever, we reject as already condemned in its unprovable first assumptions.

We believe that Creation was completed in six twenty-four hour days and that the world is not older than about six thousand years, but beyond that we maintain that the Bible teaches us an Earth that cannot be moved, at rest with respect to the Throne of Him Who called it into existence, and hence absolutely at rest in the centre of the Universe.

That is to say: we accept the model proposed by Tycho Brahe and used in all the applied sciences (e.g., practical astronomy, oceanography, gyroscopic theory, and space travel) to be the truest one possible.

Lastly: the reason why we deem a return to such a geocentric astronomy a first apologetical necessity is that its rejection at the beginning of our Modern Age constitutes one very important, if not the most important cause of the historical development now resulting in a largely post-Christian world in which atheistic existentialism is preaching a life that is really meaningless.

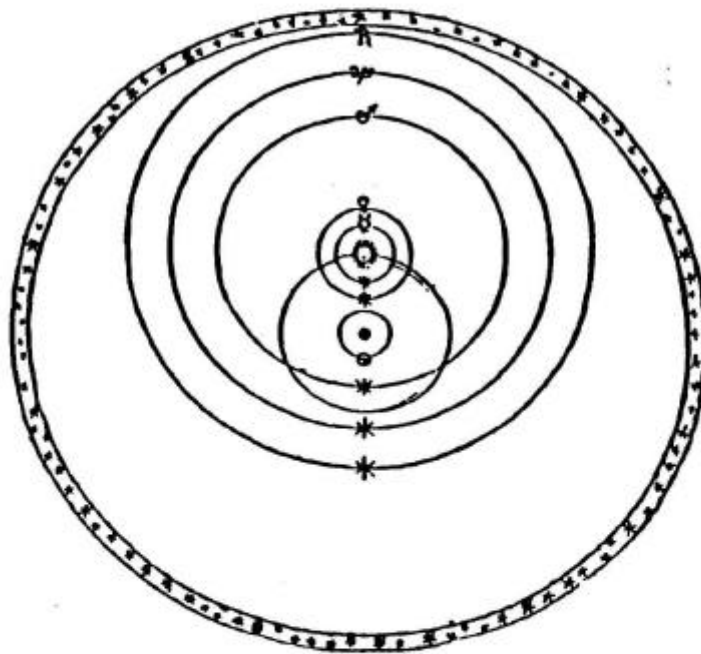
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Outside back-cover of book, *De Labore Solis*

Nova Mundani Systematis Hypotyposis

*ab Authore nuper adinuenta, qua tum vetus illa
Ptolemaica redundantia & inconcinnitas, tum etiam
recens Coperniana
in motu Terra Physica absurditas, excluduntur,
omniaq,
Apparentiis Coelestibus aptissime correspondent.*



From the second Issue of the *Progymnasmata* (1610).
This diagram first appeared In Tycho's
De Mundi Aetherei recentioribus Phaenomenis (1588).