

MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal



PRIME FOCUS

Volume 10 Issue 7

August 2005

PRESIDENT	VICE PRESIDENT	SECRETARY	TREASURER	EDITOR
NOEL SHARPE	JOHN ROMBI	IAN COOK	DICK EVERETT	BOB BEE
Ph 46474335				

MAS : Postal Address PO Box 17 MINTO 2566 Phone 0415915771

President's Report

Good evening all, tonight our guest speaker will be Dr Miroslav Filpovic from the University of Western Sydney Campbelltown.

You may recall that Miroslav gave a presentation on the transit of Venus at the Macarthur Anglican High last year when we held our special viewing of that event. Also did you catch the recent article in the Macarthur Advertiser featuring Miroslav? In that article it was mentioned that Dr Filpovic was part of the team of Australian scientists that were involved the research being done at the CSIRO involving the recent impact of the NASA space probe into comet Tempel 1. I am sure everyone will make Dr Filpovic most welcome.

Last Time We Met

I thank John Rombi for arranging the DVD on the Apollo missions to the Moon, it's amazing to think that NASA could have put it all

together over such an extended period of endeavour. Well done John for the presentation.

I have received some positive comments feedback around the various writings of Prime Focus and many members enjoy keeping up to date with news from the society. Thanks to all contributors, please keep the articles coming.

Looking Forward

I am very pleased to announce that our guest speaker for October will be Glen Dawes. Glen is part of that wonderful team that brings us the Astronomy Ephemeris every year. This book is our key reference manual that lets us know all about the events, schedules and general appearance of the night sky from year to year. Should be a great presentation.

In November we will have Bishop Chris Toohey as our special end of year speaker. Chris is the founding member of the Central West Astronomical Society, also Chris is a

long time member of the Sutherland Astronomical Society and would be regarded as this country's most experienced observer. Can't wait for that one!

A Whole Bunch of Dates

15th Aug - monthly meeting
 27th Aug - The Oaks
 3rd September - The Forest
 10th September - Open night, Dudley Chesham Oval, The Oaks
 19th September - monthly meeting
 26th September - The Oaks
 1st October - The Forest
 7th October - Campbelltown Rotary Observatory
 17th October - monthly meeting-Glen Dawes
 29th October - The Forest
 4th November - Campbelltown Rotary Observatory
 5th November - The Oaks
 21st November - monthly meeting-Chris Toohey
 26th November - The Forest
 3rd December - The Oaks
 24th December - The Oaks

I am reasonably positive that the above dates and events are confirmed. However, circumstances can change so remember to confirm with John or myself before heading out. Noel: 0410445041, John: 0425249301.

Bob Bee made a presentation to the local Philatelic Society, which went very well, great work.



The Dreamtime

One of my long held wishes is that our society could have our own observatory, observing field and clubhouse; it's a lofty ambition indeed.

Monday a few weeks ago both John Rombi and myself had a meeting with Pat Farmer. This is the second meeting that I have had with Pat and he is a strong supporter of our society. He also has attended a recent star night which we held at the St Mary's Catholic School last September.

For those who don't know, Pat is the sitting Liberal party member for the Macarthur electorate. This is still probably just a dream, however I will keep you up to date if anything develops.

...Some Developments

Just an update on our observatory proposal. I have had numerous conversations with Pat Farmer's office and I am hopeful of some positive outcomes from an article to appear in the Camden Advertiser, I'll try to get a copy. At time of writing I've made enquiries to Wollondilly Council over whether we may use some of the land at the sportsground.

Also.....

I've had a really good chat with Helen Sim; Helen is the media liaison officer for the C.S.I.R.O. and the A.A.O. We had a lengthy discussion around the way professional astronomers integrate their research into the amateur societies.

Helen is assisting me in organising a great speaker for next month's meeting. She is a great contact to have. Helen has regular

contact with all the astronomers from Parkes, Siding Spring, and The Narrabri Array.

We spoke about the mechanics involved in having our club receive information on the latest research projects. When I get my new computer and e-mail up and running, I should be able to more effectively liaise with the professional groups available through Helen.

Finally

A big thankyou to one of our members, Martin Ferlito. He has overhauled our website, if you haven't seen it, wait no longer!!!! It looks great. www.macaastro.org.au

Regards, Noel Sharpe.

Bonza Belanglo Bash

On Saturday 6th August, members of MAS took their telescopes (and wads of woollens) down to the cabin in Belanglo to treat a large number of international uni students (at least 50, maybe more) to the sights of our glorious southern sky.

It was a beautiful night all round. The sky was Moonless, clear and dark. The Milky Way was dazzling, the globulars were visible naked eye and the bar-b-que dinner was delicious. Sorry you missed out. Did I mention it was COLD?

The students were young, enthusiastic and everywhere. I gave an introductory talk in the cabin, assisted by the Society's data projector and Daniel's laptop. The talk highlighted the constellations visible that night and some of the more lurid mythology stories associated with them.

Then they were shoosed out into the dark (and boy, was it dark) to look through the myriad of telescopes set up by our members.

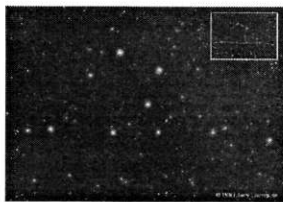
I didn't bother setting up my scope. (I was still recovering from a flu and didn't plan to stay out in the cold for long.) Instead, I used my binoculars to show some of the students between scopes some of the glorious clusters and asterisms. They really loved the Coathanger ("unreal", "weird" were some comments) and also Omega Centauri, 47 Tuc. and M6 & M7.

Actually, I worked with Daniel as a bit of a tag team. I would show them an object in my binoculars, and then send them to Daniel's 12.5" light bucket to see it close up.

At the end of their night, when they were bundling into their buses, they all seemed happy and appreciative for what they had seen and what our members had been able to show them.

Some members then stayed on for personal observing (and what a sky for it) while others, including yours truly, went home to a warm bed. I don't know about the others, but I came close to cleaning up a wombat (and my Charade) on the way out of the forest.

Thanks to all who went down with their telescopes to show these young people the beautiful southern sky. Well done. RB



Coathanger

Wot IC This Month

August 15 – Sept 18, 2005

The Sky at 8 pm

Spica and Arcturus are in the north western sky, overhead the menacing shape of Scorpius with its red heart Antares, and the bright teapot of Sagittarius. Due north is Ophiuchus and Hercules with Altair in the Eagle; Vega in Lyra, and Deneb in the tail of the Swan making the Summer Triangle for northern people to the northeast.

In the south Crux is lying on its side to the west; followed by Alpha Centauri; the crooked cross of Grus, and white Fomalhaut due east; bright Achernar rising from the southeast; and Canopus very low on the southern horizon.

The Moon Diary

20/8 Full Moon,
27/8 Last Quarter,
04/9 New Moon,
11/9 First Quarter,
18/9 Full Moon,
23/9 Last Quarter Moon in front of Pleiades

Evening Planets

Venus rises in Virgo just after 8 pm heading for a clash with Jupiter and Spica at the beginning of Sept. On 7th September a thin crescent Moon will join their dance. Venus will remain bright and high in the western sky till the end of the year, even after daylight saving.

Jupiter is also in Virgo setting round 9.30 pm, (8 pm in Sept). An interesting interplay will be with Venus, Spica and the Moon between 1–7th September.

Neptune remains relatively bright in Capricornus just past opposition and visible all night less than 1½° from tau Cap.

Uranus rises in Aquarius round 7 pm. Visible most of the night the green planet is located 1° from lambda Aqu. It is relatively large and bright at 3.6 arc seconds size and 5.7 magnitude, moving to opposition on the 1st September.

Mars rises in Aries round 11.30 pm and moves nearer to Taurus each day. Because of its angle to Earth it appears egg-shaped in a telescope. Now is the time to start honing your Mars observing skills as we prepare for the close approach in November.

Morning Sky

Mercury has moved to the dawn sky, rising just one hour before sunrise at 5.45 am on the 24th August. This will be its highest point from the Sun after which it will drop back behind Ol' Sol to reappear in the evening glow in October.

Saturn appears in the dawn sky just before sunrise near the end of August. It will climb higher each day till it will be rising at 4 am when we next meet in September.

There are no **Meteor** showers this month and also no **Comets** brighter than 12th magnitude.

Portraits in the Sky

PAVO – The Peacock

Pavo is a large constellation showing the tail of the peacock in full display. Although it is a modern era constellation it has links to ancient myths. In fact it reads a little like our own newspaper headlines.

Hera was the wife of Zeus (Jupiter) and hence the Queen of the heavens. She was an excessively jealous woman and with good reason for Zeus was an excessively amorous god. It is said he had over 50 lovers and mistresses and Io was one of them.

The trouble was, Io was one of Hera's priestesses, and Hera soon discovered the infidelity. In haste Zeus transformed Io into a cow. How appropriate you may think! But Hera was not fooled by the disguise, and claimed the cow for herself. She then hired Argus Panoptes who had 100 eyes to guard the animal.

Zeus was very crafty and determined so he hired Hermes to steal Io away. Hermes, who is also called Mercury, charmed Argus of the 100 eyes with the sounds of a flute and when he was fast asleep with all his eyes closed, Hermes threw a huge boulder on him and cut off his head.

Hera was so angry she sent gadflies to sting and infest Io the cow, who roamed throughout most of the Mediterranean nations before Zeus found her and changed her back into human form. She later became the goddess Isis in Egypt.

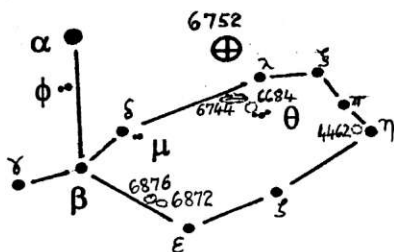
As for the unfortunate Argus Panoptes, Hera put all of his 100 eyes on the tail of her sacred bird, the peacock.

Only much later, in the seventeenth century did Johann Bayer introduce Pavo the Peacock constellation in his *Uranometria* of 1603.

So Argus is remembered in the Peacock which with a number of other birds like Apus,

Grus, Phoenix, and Tucana, form that part of our sky known as the Aviary of the Birds

While the Bayer stars are not very bright, there are several deep sky objects of interest in the constellation.



Double Stars In Pavo

Alpha Pavonis is a very close binary that orbits in a spectacular two weeks. Unfortunately it is too close to be separated by telescopes.

Xi Pavonis at the top of the fanned tail feathers is a visual binary: 4.4. 8; PA 154 degrees, and separation 3.5".

Deep Sky Objects:

NGC 6752 is a splendid globular cluster, large and bright and compact. It's about 10° WSW of alpha Pav. (omega Pav. is just to the west). It is easily found in binoculars working 10° directly west of Alpha Pavonis.

This cluster is the third largest globular (in apparent size) after Omega Cen. and Tuc 47. It is one of the closest globulars, at about 20,000 light years away.

Now move directly south 4° to find **NGC 6744**. This is a very large and a fairly bright barred spiral galaxy. The galaxy is found 3° SE of lambda Pavonis.

Moving on southwest 2° to a group of three stars in a shallow semi circle you can find **NGC 6684** an 11.7 mag elliptical galaxy very close to theta Pavonis.

IC 4662 is located in the same field as eta Pavonis on the Triangulum Aust side. This is a faint irregular galaxy with a rich field and nebulosity. It will help to put eta Pav. just out of the field of view.

NGC 6872 and 6876 are two other 12th mag galaxies $30'$ northeast of the 4th magnitude epsilon Pavonis.

Now let's go back to the Milky Way galaxy disk for:

Scutum -The Shield

Invented by the Polish astronomer Johannes Hevelius, and listed in his catalogue *Prodromus Astronomiae* of 1690, the shield became better known after being published in 1725 by John Flamsteed.

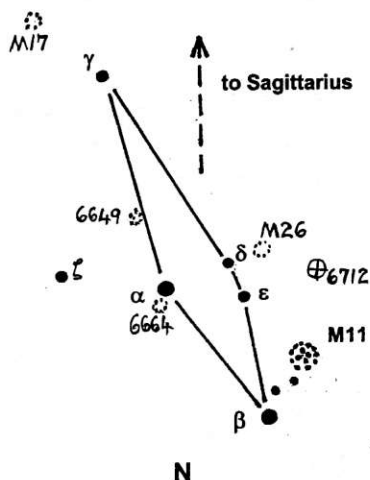
Its full name is **Scutum Sobiescianum** - Sobieski's Shield, as the constellation honours Jan Sobieski, (1629-1696) who was the eldest son of the lord of Crakow, and the saviour of eastern Europe.

Sobieski was a brilliant military leader and commanded the Polish army in their defence of Poland from the Turks. Fearing defeat the elected Polish king (a politician?) gave all his Ukrainian territory away to Turkey, in a cowardly submissive act, even while his army

was winning the fight. In November of that year (1673) he died and Sobieski immediately left the front lines and presented himself as a candidate for the throne back in Warsaw.

Elected in May of 1674 as King Jan III, Sobieski remained in charge of the war and personally led the Polish cavalry in September 1683 to break the Turkish siege on Vienna. After nearly a ten year struggle, he was able to sign the Treaty of Warsaw with Leopold I, and set Hungary free at the same time.

Seven years later Hevelius commemorated these events with **Scutum Sobiescianum** in the heavens. The small faint asterism does resemble a simple shield, but is easy to find at the tip of Aquila.



Double stars:

Delta Scuti is one of the most famous variable stars, brightening and fading within 4.5 hours. The range of its cycle is very slight

so is difficult to notice. It has an optical alignment faint companion (4.5, 12;) separation 15".

Struve 2373 is not visible naked eye but at 7.2/8.2, separation 4.0 it can be found in the finderscope 1° south M26 just beyond a 6th mag star.

Struve 2325 is a 6th mag. star located 2.5° southwest of alpha, 6.0, 9.0 and 12" separation. It is within 30" of the open cluster **NGC 6649**.

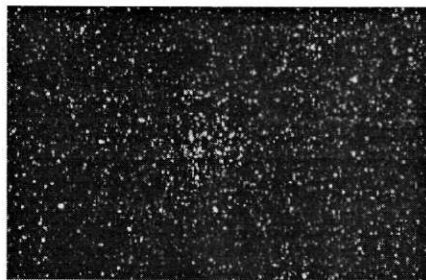
Struve 2306 WSW of gamma Scuti is just 1° north of M17. This equal white double 8.0, 8.0 separation 10" may be more difficult without a star chart.

Deep Sky Objects:

NGC 6664 is a small sparse group of 10th magnitude stars 0.5° to the east of alpha Scuti. It is best viewed at low power.

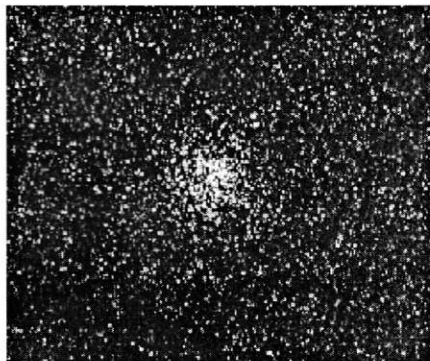
NGC 6712 is a globular cluster further east from 6664. Another way to find it is at the base of an arc of stars to the east of M26.

NGC 6694 - M26 is another open cluster of about thirty stars that resemble a miniature horseshoe, 1° SE of delta Scuti.



M26

NGC 6705 "Wild Duck Cluster", M11 is a fine open cluster of perhaps four hundred stars that fan out like a flight of startled ducks. The cluster is 1° SE of R Scuti.



M11

Another nice binary, **Struve 2391**, is found between R Scuti and M11: 2.6, 9, sep. 38".

So that's it this month, some spectacular views and some teasers as well.

Good seeing

IC

10th, 12th or Nilth?

That great debate and controversy is on again. With the discovery of this Kuiper Belt Object (KBO) about 1.5 times the diameter of Pluto and around twice the distance out, the debate as to whether it should be dubbed the 10th planet (as the media is raring to do, not to mention its discoverer) or Pluto should be demoted from 'planet' to just 'plummy big KBO'. Then there are Sedna and Quaoar which are almost as big as Pluto and between Pluto and object 'X'. Should they be planets 10 and 11? Enjoy the ensuing debate.

Have your say.

RB

CONTENTS

The Aim and Extent of this Paper.
Introduction and Status Quo.
Sources of Information.
Definitions.

1. Development of Our Universe

The Traditional View.
The Scientific View.
The Philosophical View.

2. Anthropological Reasoning

The Basic Anthropological Theory.
The Weak Anthropic Principle.
The Strong Anthropic Principle.
The Fine-Tuned Universe.
The Multiverse Theory.

3. Anthropological Numbers and Events

The Large Numbers..
The Physical Constants.
The Anthropological Coincidences.

4. Conclusion.

The Aim and Extent of this Paper

Our concept of the Universe is being constantly challenged by new ideas and theories.

One such question is centered on the early development of our Universe and its suitability for conscious life on Earth. This paper will analyse briefly the present-day scientific theories about the ideas of *causative* and fine-tuned, intelligent design, against the over-simplified and *non-causative*, random-chance process.

These ideas are still being unresolved, and will be described here under the following two so called scientific theories:

One, the basic anthropocentric theory, called the *Anthropic Principle*, (A.P.)

Two, the alternative argument against it, the many worlds theory, called the *Multiverse*.

Introduction and Status Quo

Numerous cosmic coincidences of the early conditions in our Universe did encourage certain scientists and cosmologists to make from them an anthropocentric deduction, and to formulate a claim that those coincidences of special conditions *caused* to pre-determine not only the development of our Universe itself, but also the appearance of conscious life on Earth.

This theory was introduced to the scientific community as the *Anthropic Principle*. (A.P.) It is *anthropic*, as it comes from the Greek word for *human*. The word *anthropic* is an incorrect idiom, its users meant *anthropological* or *anthropocentric*. However, it cannot be called a *principle* either, because its *conclusion* is not verifiable by science; therefore it is more like a *theory*. To start with, this argument is acceptable, but as we will see later on, it might equally apply to those theories objecting to the A.P.

The A.P. has been interpreted by its adversaries throughout the past decades as a *free-standing* and an *incomplete* proposition; therefore according to some cosmologists, it is worthy of suspicion and even rejection. It is true that it is a *free-standing* theory because it is isolated; science is unable to compare it with any other criterion for verification. It is also true that it is an *incomplete* theory, because it emphasises only one idea that is the precisely fine-tuned initial conditions in the Universe were an act of intelligent design.

This argument of the A.P. being free-standing and incomplete is also acceptable, but it might again equally apply to those theories objecting to the A.P.

Not as if there was ignorance on the part of those who formulated the A.P. in the first place; their claim was backed up with scientifically verified observations, and they were based on the applications of the Law of Causality, the calculations of the physical laws and the constants of cosmic events. Some cosmologists therefore acknowledged that because of these scientific bases, the A.P. is deemed to be at least an acceptable *scientific* theory, and it merits consideration just as any other scientific theory. This is the most the A.P. has achieved in the field of science and cosmology up until today. But it stirred up many people.

The reason being is that in the opinion of adversaries of the A.P. these fortuitous *accidents* in nature had to happen the way they did, for *reasons* unknown to us, and will probably never be known, for these *accidents* have been, (collectively taken), a *single event* in the history of our Universe. This aspect of *single event* is acceptable, but at the same time it raises some doubt about the rightful *authority* to deal with it by either party, the advocates for the A.P. as well as its adversaries, as neither can scientifically verify the underlying *causes* nor can explain the metaphysical *reasons* for such a *single* cosmic event.

Consequently, while cosmologists attempt to interpret a *singular* event in our Universe that deals with metaphysical ideas of *purpose* and *destiny*, they can never be expected to produce in their theories a scientific certainty of evidence for or against the theory of A.P.

Sources of Information

The following authors found to be clear and helpful to a great extent in compiling this paper:

M. Waldorp: *Complexity*. H. Pagel: *The Cosmic Code*. P.W. Davies: *The Accidental Universe*. J. Gribbin: *The Omega Point*. Gribbin & Sir M. Rees: *Cosmic Coincidences*. Davies & Gribbin: *The Matter Myth*. Stoeger S.J., Ellis & Kirchner: *Multiverse & Physical Cosmology*, (arXiv:astro-ph/0407329v1-16 Jul 2004). Dawkins: *Climbing Mount Improbable*.

1. DEVELOPMENT OF OUR UNIVERSE

Although the question of development of our Universe, and the history of conscious life in it, appears to be presented through the media and even in some scientific papers as a simple question of yes or no, it has many complex issues associated with it. Therefore it may help if it would be introduced first from three different views. These are the following:

The Traditional View: based on historical data, gathered throughout the ages, which led to anthropologically-centered conclusions about certain cosmological objects and events.

The Scientific View: based on physical observations of laws and constants of nature, and made scientific deductions. From here on the cosmologists proceeded on two different ways. While one group reinforced the Traditional View, the other rejected it. Oddly enough both, the acceptance and rejection of the Traditional View was based on the same reasoning that is the *causality* and its implications.

The Philosophical View: based on the above two Views and with the analysis of the common physical criterion, the Law of Causality. Here, the human reasoning reaches beyond the physical reality in its search for the ultimate answers.

1.1 The Traditional View.

Life evolved 3.5 billion years ago as an ever increasing order out of the pre-historic chaos. This emerging life later programmed itself randomly through mutations and variations, plus non-random cumulative natural selection of the species, ("and not through random chance as mistakenly thought by many"; Dawkins.)

Nature reached a major epoch around 2.7 million years ago, when it produced conscious human beings, as if this time it created a greater order out of chaos. The end result of this natural process seems to be two-fold, namely:

First, what was there before a blind process, it now in its blindness produced what is not blind, but a self-aware, reasoning human being, with freedom of mind and freedom of will.

Second, it appears, as if the blind process of nature handed over the role to the conscious mind to lead humanity out of chaos.

Humanity's long journey began by the conscious self and others, through the pre-historic cultural and tribal traditions. Their mental picture became slowly enriched by the images of the splendour of heavens, through their unscientific view, the anthropological view. In their belief, everything existed for the sole benefit of human beings. Earth was the center of their reality, the center of the Solar system and of the Universe. It all changed by Copernicus in the year 1543, who published

his revolutionary model of the Solar System, placing the Sun at the center instead of Earth.

1.2 The Scientific View

The gradual understanding of nature was based on scientific observation of celestial objects and events, the scientific analysis of natural laws, forces and the mathematically deducted universal constants. These investigations turned the attention to the approximate scale of cosmic dimensions that placed human beings at the center, between the two extreme opposites of nano- (10^{-9} m. of bio-molecules) and the giga-measures (10^9 m. of stars). This fact confirmed the scientists' conviction in that, human beings were, so to speak, the *end-purpose* in the Universe.

Then the theory of *fine-tuning* of special conditions and *purpose* in design was formulated and published in the year 1903 by Wallace and Carter, called the *Anthropic Principle*, (A.P.), and developed further by Barrow and Tipler, et al. This A.P. was based on the Law of Causality, lending it a quasi-scientific legitimacy. However, the A.P. created concern among many scientists and cosmologists for its interpretation, which led them directly to the concept of *intelligent design* and into conflict with their adversarial view of development by *blind-chance*.

Questions about ultimate meanings and values of nature were no longer settled in caves or around camp fires, (except of course at MAS, at the Oaks and Ilford), but at higher places of learning, observing through telescopes, (such as Hubble ST), through books and technical journals. These opportunities provide us with up-to-date knowledge of scientific theories and models of our Universe and even possibly about many other worlds.

From a purely anthropocentric point of view, however, cosmologists have made two controversial decisions in recent times:

One, they dismissed outright the A.P., oddly enough, on the one hand, because of its reliance on the (hypothetical) **certainty** of purpose in fine-tuning by *intelligent design*, while on the other hand, they dismissed it because of it being incredibly **vague**; i.e. as they say: "you can if you want, explain with it almost anything". So much so that a warning became fashionable among cosmologists, that even thinking about the A.P., "it could get you into deep trouble".

Two, Because of the A.P.'s pointed reference to an *intelligent design* in the Universe, its adversaries replaced it with a (hypothetical) **uncertainty** of the many worlds theory, which achieved the same fine-tuning, but now through *blind-chance*. This alternative solution instantly removed the need for fine-tuning of our Universe by intelligent design.

Those cosmologists who opposed the A.P. created a problem for themselves by adopting the theory of *many worlds*, which based on the *uncertainty* of the quantum theory, "*began to grow and grow without limits to infinity*".

This theory proposes fine-tuning of our Universe by *chance* instead of fine-tuning by *design*. And if a single universe's life- time of 13.7 Gy, as in our Universe, wouldn't have been sufficient for such a chance process to develop conscious life, then the *many worlds* theory hoped to solve the problem through the *blind-chance* cooperation of its indefinite number of many worlds.

There are two major theories that describe the many worlds, and these are:

One: the Multiverse. This theory is based on quantum fluctuation, *causally connected* with the Big Bang of our Universe, which grew out of control and expanded exponentially. This Big Bang could have happened many times, creating an *indefinite* number of similar quantum fluctuations. The result of all this is that every universe-domain, one of these being our Universe, could have evolved by *chance*, which is suitable for conscious life, without any fine-tuning by intelligent design. This theory was first proposed by a physics-doctorate student, Hugh Everett, USA, 1957.

Two: the Parallel Worlds. This theory is vaguely similarly to the above Multiverse, but in this case there could be *infinite* number of distinctly separate and autonomous *cosmic-domains*, *causally disconnected* from our Universe and from one another. They may be either *a universe in a universe*, *in a universe*, ad infinitum or perfectly identical in individual size but differing only in quality. The possibilities are endless, and they only depend on one's speculative imagination. These worlds may be called anything you like, because who knows what they would be like, besides they may not even exist in the reality.

This theory was published by Andrei Linde, in the Scientific American, in 1994.

From here on, for the sake of simplicity, this paper will consider only one type of the many possible worlds, and that is the **Multiverse**, which term corresponds with the item **One** above, i.e. the quantum fluctuations type universe-domains, with *causal connections* with the Big Bang of our Universe.

1.3 The philosophical View

Scientists and cosmologists were the first to establish the *causal effects* of the fine-tuning of specific events in nature, which provided the *basis* for the special conditions in our Universe. The theory of A.P. was based on those very same causal effects. Now, however, the adversaries of the A.P. contradict themselves by saying that while their observations and mathematical calculations indicated an inexplicable *certainty* in fine-tuning of special conditions, and yet, in the case of the A.P. the only interpretation can be that those events were the result of fortuitous *accidents* and a design by *blind-chance*, (which is anything but *certainty*).

In the opinion of the *adversaries*, the A.P. had no authority to interpret a purely *physical* event of fine-tuning with *metaphysical* reasoning of *intelligent design*. On the basis of this quite *correct* argument, not even the laws of physics and the (hypothetical) certainty of causality were sufficient reason for them to accept the A.P.

Therefore, the adversaries came up with an alternative theory of the *Multiverse*, without the reliance of any metaphysical reasoning for fine-tuning; however, by this theory they shifted the (hypothetical) *certainty* of A.P. out of our Universe to a (hypothetical) quantum *uncertainty* of indefinite number of universe-domains.

General Comments: The problem in *both* theories, the A.P. and the *Multiverse* appear to be the following:

- They are scientifically free-standing and incomplete propositions.
- They have no testability.

- They attempt to scientifically interpret *singular event* in the history of our Universe.
- They attempt to formulate a scientific proof on the basis of physical reality, (such as an *observation* of an event), with extrapolation to a metaphysical concept, (such as an abstract idea of *purpose* or *chance*) for its conclusion.

For these reasons one may ask if these theories should be regarded as physics or metaphysics.

End of Part 1

Frank Kish ■

[Note the *Definitions* insert in this issue. Retain it for reference with future installments of Frank's paper.]

A Slice of Heaven

It's really nice when a predicted event actually comes off. My predictions in the **Heavens Above!** Column in the Chronicle often suffer from the nemesis of astronomy – cloud.

But last week, for the 8th, 9th and 10th August, I had promised people some 'pretty views' of the crescent Moon with Venus and Jupiter. Thankfully, the weather cooperated and on Monday, a dazzling Venus perched beside a sliver of Moon (a little over 1° apart), on Tuesday the Moon was mid-way and perfectly in line with Venus and Jupiter – a vertical line dance – and on Wednesday, the crescent was within 1° of Jupiter. I stopped in the railway carpark, in the cold, and stared at these pretty pictures in the sky. Hopefully, my readers did the same and decided I can get it right ... occasionally.

RB

The Anthropocentric Universe

ffk. Jan. 2005.

DEFINITIONS

In order to form a global view of the subject-matter, in general, and for a better understanding the complexity of this text in particular, there are several concepts and key words that require descriptions and clear definitions. These ideas were taken basically from the Aristotelian Philosophy, which states also that almost every issue in dispute that arises from a philosophy of thought can be traced back to the ambiguities of the philosophy of language and its definitions. These key words and ideas are the following:-

Material Reality: As opposed to the make-believe and imagined "other worlds", an *objective*, material reality is represented by the physically *identifiable form* configured with a material substance. The result of this configuration, as conceived and judged by the human mind, is called *matter*, which is the quintessence of truth of existence in reality. There is no material substance existing in reality, be it animate or inanimate, without its *identifiable form* that is its attributes, by which it could be described.

Although an objective, material reality is the product of the mind, its basis for this reasoning process lies in scientifically provable evidence of existence and of facts or events in real space and time.

Objective reality, according to Einstein, does not depend for its existence on the conscious individual's observation. However, one should add that while reality does not depend on the observer, an observer's mind is the only one that can judge and verify material reality by describing its attributes.

A subjective reality belongs to the realm of "idealism", which has no part in this text or in the physical reality.

The Physical Universe: The totality of all material objects and events that exist in the spacetime reality. This comprises all clusters, super-clusters of galaxies and other physical features. Its contents are all types of energy and matter.

The Universe is governed by the forces of nature, the physical laws and constants of microcosm and macrocosm.

Our Universe had a beginning in time at the moment of Big Bang; its expansion in space may go on for ever or it may recycle back to its original state in a Big Crunch; it may all depend on the material density, the Omega factor, and above all the Law of Entropy.

Existence: It is the realisation of all acts in an identifiable bodily form of an individual unity, as an animate or inanimate being, in or with itself alone, and not shared with other being whatsoever. To exist therefore is to mean having an identity.

Life: The essence of human life is the capability of a contingent and animate being to sustain and improve by self-repairing its bodily functions as required for its existence and reproduction. Every human being is produced by other human beings, and it is dependent ultimately upon extrinsic causes in its survival, which is transient, that is contingent by nature.

(In addition to the above philosophical definition, it may be illuminating to read a quotation from an eminent biologist, Richard Dawkins, pp.259; on the question of what life is?: "*Most, though not all, of the informed speculation begins in what has been called the primeval soup, a weak broth of simple*

organic chemicals in the sea. Nobody knows how it happened but, somehow.....a molecule that just happened the property of self-copying-a replicator. This may seem like a big stroke of luck.....this kind of luck does happen.....An origin of life, anywhere, consists of the chance arising of a self-replicating entity. Nowadays, the replicator that matters on Earth is the DNA molecule, but the original replicator probably was not DNA. We don't know what it was."

On p.262 He adds: ".....the original self-duplicating entities must have been simple enough to arise by the spontaneous accidents of chemistry."

On p.75 Discussing self-replication: "There are many theories of why sex exists, and none of them is knock-down convincing.....But the whole question of sex and why it is there,a difficult one to tell."

The Observer: The most important role of an observer is to verify the properties of *material reality* in the Universe, on whose basis a scientific theory is built. One of the purposes of our Universe is that it is to be *intelligible* to its inhabitants, and this aim would be forfeited by not having *suitable observers* for the purpose. A suitable observer must have an *intellectually conscious* mind and *free-will* to explore. Paradoxically the material reality *includes*, as an inseparable part, the observer itself, and yet, the observer must at the same time exercise its intellectual consciousness through an impartial objectivity.

It seems from the above that while we observe the reality around us, such as when viewing the stars, metaphysically speaking, we are observing ourselves, that is we are searching for our identity.

Intellectual Consciousness:

a) All active living beings have a rudimentary, animal consciousness, in that following their instinct, they are motivated by mental states of sensory faculties, desires and memory, but they don't consider or plan consciously, they do not reason or speak. Animals are not self-conscious.

b) Human consciousness in general is the inner aspect or the subjective reality of an adequate mind. The mind is the center of human consciousness, that is to say: To possess a mental state is to be conscious of it.

c) Intellectual Consciousness can be described in various ways to suit its functions, which are the following:

- *Intelligence*, instant recognition of truths in an abstract and universal way as self-evident.
- *Reason*, thinking out connected steps of several abstract truths that are not self-evident.
- *Intellectual Memory*, retention of knowledge.
- *Conscience*, the intellect as reason thinks out the moral implications of an act, involving the concepts of rights and duties, and responsibilities to oneself, Creator, family, sick and the infirm (young and old), animals, the environment, society and the nation.
- *Intellectual consciousness*, it is an understanding awareness of the self, (self-consciousness), and of mental and bodily activities, and of the physical and metaphysical realities around us.

These definitions of *intellectual consciousness* are in direct opposition to the so called *computer-generated* mechanistic "consciousness" that may be endowed the super-human beings in their final evolution. These definitions not only demonstrate the complexity of human nature, but also the

society in which it is expected to function as a *person*.

The universal affirmation by human self-awareness of identity is expressed as "*I am*"; Hegel put it as being a phenomenon of the "*divine nature of language*".

It also refers to the simple fact that in essence our intellectual consciousness is, really, nothing more than an *awareness* of our existence.

Weinberg said: "*Self-consciousness and free-will in human beings do not derive from physical laws. They are more than an accident or chance. It is the crown of being a person. The Theory Of Everything would have to exclude such concepts as consciousness and free-will, which is purpose and direction of a person*".

Contingent Being: Every animate and inanimate being that had a *beginning*, is a contingent being. A contingent being is non-essential by nature and *finite* or transient in real space and time. In other words, it does not have a *reason* for existence in itself. A contingent being is the *product* of other contingent beings.

It has limited existence in the physical reality, in so far as its spatial extensions and temporal changes are concerned, and it is true to its nature only under its *existing* physical *conditions*.

It is subject to the laws of the physical Universe and the forces of nature, which are set immutable in that contingent beings must conform to them, without being able to react back on them and alter them.

A contingent animate and inanimate being demands absolutely, as a cause for its very limited existence, a continual *dependency* in being on some other contingent beings. Every contingent being is an effect of a cause.

Law of Causality: The following concepts are the rock-bottom basis of the physical/astronomical and cosmological reasoning and understanding of events and theories.

Cause: It contributes to the being of an actual reality.

Cause can never act without a purpose, and every purpose is finite.

Every cause must end in an effect.

Every chain of events in the reality must have a cause.

A chain event cannot be endless; (otherwise you would die before reaching the tap.

All causes in the reality are effects, before they become causes of further effects.

Cause can never be unpredictable, as every cause is a reason with certitude of understanding it. Reason, however, can never be a cause.

Effect: It is produced by the activity or operation of a cause in the reality.

Chance: It can never be a cause, as it is a circumstance, meaning that the effect it produces has a nature of unpredictability. (If all the reality of the Universe is a chance-effect, one may ask: What is the cause of all these effects?)

Reason: It can never be a cause, as reason can only explain the reality that is not self-evident to the mind.

Purpose: In the physical world, according to Aristotle, the principal agent in all events is the Law of Causality. Every cause is an action of *energy* with reference to time, which results in a *purpose*; (Action = Energy x Time = Direction). There are four types of *Causes*, the Formal, Material, Efficient and Final cause; the **Final cause** is carried out only by animate beings, (such as plants/ animals/ humans), as its *agents* in the physical reality, because it points to an end, a **purpose** of a

causative action, (such as in the *growth* of a tree).

Metaphysics:

a) The General Metaphysics or *Ontology*, deals with reality as viewed without or beyond material limitations. Therefore, the basic *object* of metaphysics is to analyse the meaning and the property of non-material real *being* as such, considered in itself and not as it exists in this nature or in any other nature. The *subjects* of metaphysics are the nature, the properties and the classification of *Being*. The basic concept of *Being* includes: the logical order of knowledge, the forming of abstract ideas, transcendental ideas, the concepts of goodness and truth.

b) The Special Metaphysics or *Cosmology*. This includes:

i) The *Astronomical Cosmology* is considered a branch of Physics and Astronomy, whose single subject is the Universe, its history and the natural processes that govern it.

ii) The *Philosophical Cosmology*, the Philosophy of Nature. It deals with fundamental questions of cause and effect, time and space, infinity, matter and form, change, contingency, the nature and properties of inanimate and animate beings.

Based on these terminologies, therefore, *Metaphysics* has no supernatural or religious connotations or any other strange meaning that is often attributed to it by mistake or ignorance.

Fine-Tuning or Anthropological Numbers:

There are certain, precisely tuned, fortuitous numbers and physical events in our Universe, that are considered to be essential for the development of the Universe itself, as well as the development of life in it. These quantities

are causally-based and although scientifically confirmed, they have eluded so far every scientific explanation. These quantities are set up in three general groups and referred to as: *The Large Numbers*, *the Physical Constants* and *the Anthropological Coincidences*.

The Basic Anthropological Theory: There are *two theories* under this heading, namely:

- "**The Weak A.P.**" This theory is not a physical theory but only an anthropological explanation that is considered by the scientific community as *harmless* and unobjectionable.
- "**The Strong A.P.**", This theory is based on and the development of the *Weak A.P.*, which places restrictions on the explanations of laws of physics and of the physical constants of nature, resulting in that human life came into being due to *purpose* in design. Science is *antagonistic* to this version of the A.P.

The Multiverse Theory: According to the *adversaries* of the *Strong A.P.*, as there was an insufficient time available in our Universe during the cca. 15 Gy. (Giga-year = 15 billion years), for the precise *fine-tuning* of all special conditions through *blind-chances* and *accidents*, a theory of *many worlds* was introduced on the basis of the random-quantum fluctuation, which has an indefinite number of universe-domains, with properties of infinite variations and combinations. Our Universe is being one of these universe-domains.

This theory replaced the fine-tuning by intelligent design, reasoning by that given an infinite series of blind-chances, everything will eventually happen even within a 15 Gy. time-span.