

ISSUE #2

JUNE 2009

# Beagle Society Meeting

## June 15, 2009

This month, June, William Nedblake, with some assistance from John Kuhns, will lead our exploration of the strange world "After the Dinosaurs."

This will be an exposition of the wildly odd mammals, and other animals, that came about after the extinction of the dinosaurs. This time period is known as the Cenozoic Era. The word "Cenozoic" is derived from the Greek and means "new life." The Cenozoic is divided into two main subdivisions: the Tertiary and the Quaternary. The Tertiary, from 65 million years ago to 1.8 million years ago comprises most of the Cenozoic. The Quaternary includes only the last 1.8 million years.

The following is quoted from "Cenozoic Era: Stratigraphy" (<http://www.ucmp.berkeley.edu/cenozoic/cenostrat.html>) : "In the 1760s and 1770s a geologist named Giovanni Arduino (1714-1795) was studying the rocks and minerals in Tuscany. He classified mountains according to the type of rocks he found there. Unfossiliferous volcanic rocks (schists, granites, and basalts) that formed the cores of large mountains he called 'Primitive'. Fossil rich rocks of limestone and clay that were found on the flanks of mountains over the Primitive rocks were called 'Secondary'. Finally, there were another group of fossiliferous rocks of limestones and sandstones lying over the Secondary rocks and forming the foothills of the mountains that Arduino called 'Tertiary'. At first, then, Tertiary referred to a certain type of rock found in the area of Tuscany. Later, however, geologists used the fossils found in the Tertiary rocks there to recognize rocks of the

same age elsewhere. Rocks with the same species of fossils were, therefore, of the same age."

"Extensive Tertiary age rocks were recognized in the Paris Basin, which is the area around Paris, France. In the 1820s and 1830s Charles Lyell, a noted English geologist who had a great influence on Darwin, subdivided the Tertiary rocks of the Paris Basin on their fossils. Lyell came up with an ingenious idea. He noticed that the rocks at the top of the section had a very high percentage of fossils of living mollusc species. Those at the bottom of the section had very few living forms. He deduced that this difference was because of the extinction of older forms and the evolution of living forms during the time that the rocks were being deposited. He divided the Tertiary rocks into three sub-ages: the Pliocene, the Miocene, and the Eocene. 90% of the fossil molluscs in Pliocene rocks are living today. In the Miocene rocks, only 18% of the molluscs were of living species, and in Eocene rocks, only 9.5%."

"These subdivisions of the Tertiary have been correlated around the world using the fossil species in them. Rocks with the same species as Lyell's Eocene, are

(Cont. on Page 2)

CENOZOIC	Quat.	Pleistocene	
	NEOGENE	Pliocene	
		Miocene	
	TERTIARY	Oligocene	
		Eocene	
		PALEOGENE	Paleocene

## *Stop me if you've heard this one...*

Leif Bahl, Beagle Staff Astronomer

*\*Two moons on 27 August\**

*27<sup>th</sup> Aug the Whole World is waiting for...\**

*Planet Mars will be the brightest in the night sky starting August.*

*It will look as large as the full moon to the naked eye. This will cultivate (sic) on Aug. 27 when Mars comes within 34.65M miles of earth. Be sure to watch the sky on Aug. 27 12:30 am. It will look like the earth has 2 moons. The next time Mars may come this close is in 2287.*

*Share this with your friends as NO ONE ALIVE TODAY will ever see it again.*

This email, or something like it, comes around *every* year. And *every* year *every* astronomer, professional and amateur, must take the time to debunk it over and over and over. We wish Mars would look as big as the full moon; that would look really cool. Sadly this is not and never will be the case.

What will happen on August 27 this year? In the late afternoon, the Moon will occult (pass in front of) the red supergiant Antares. This might be visible in a telescope. Three planets (Jupiter, Uranus, & Neptune) and Pluto will be visible in the evening. Mars and Venus will be visible in the morning. Mars rises a little after 1:30 am. At magnitude 0.99, Mars will be the 16<sup>th</sup> brightest object in the northern hemisphere's night sky, pretty bright but nothing too over the top. By this date Mars' apparent size swells only enough to see the disk of the planet but few if any surface features. It will appear only slightly larger than Uranus that same evening. Despite the promise of the hoax email, neither the moon nor Mars will be up at 12:30 am on August 27, 2009.

Mars is on its way to a somewhat close approach with Earth by August 27, but it will not happen until January 27, 2010. Mars has already begun its climb toward being bigger and brighter. In other words, Earth

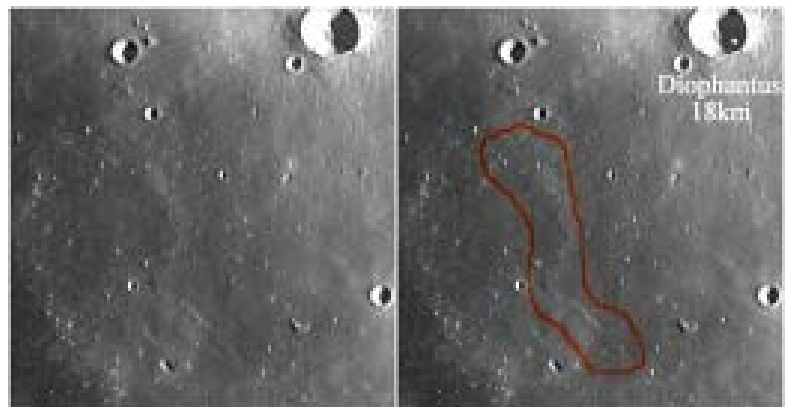
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### Beagle Society Meeting (cont.)

considered to be the same age as those in the Paris Basin. The same goes for the other subdivisions. Some time later it was noted that in areas other than the Paris Basin, there were rocks that seemed to be from time periods that were not represented in Lyell's sequence. This was because during those periods there had been no deposition in the Paris Basin. These two periods, later designated Oligocene and Paleocene, were inserted into the Tertiary."

*To make reservations for the meeting, please call us at 816-587-9998 or email to [clk@hms-beagle.com](mailto:clk@hms-beagle.com).*

**Little known fact** (from *Wikipedia*; the free encyclopedia): **Dorsum Arduino** is a wrinkle ridge at 24.9°N 35.8°W in the border region between Oceanus Procellarum and Mare Imbrium on the Moon. It is 107 km long and was named after Giovanni Arduino in 1976.



right now is approaching the Red Planet. So start observing Mars now to watch it change over time as we catch up to it, overtake it, and finally leave it behind. In early June it rises a little after 3:30 am with brilliant Venus to its right.

So where does all this hoax-email nonsense come from? Mars and Earth did make a historically close approach back in 2003. And there was an email encouraging every one to go out and look:

*The Red Planet is about to be spectacular! This month and next, Earth is catching up with Mars in an encounter that will culminate in the closest approach between the two planets in recorded history. The next time Mars may come this close is in 2287. Due to the way Jupiter's gravity tugs on Mars and perturbs its orbit, astronomers can only be certain that Mars has not come this close to Earth in the last 5,000 years, but it may be as long as 60,000 years before it happens again.*

*The encounter will culminate on August 27<sup>th</sup> when Mars comes to within 34,649,589 miles of Earth and will be (next to the moon) the brightest object in the night sky. It will attain a magnitude of -2.9 and will appear 25.11 arc seconds wide. At a modest 75-power magnification Mars will look as large as the full moon to the naked eye. Mars will be easy to spot. At the beginning of August it will rise in the east at 10 p.m. and reach its azimuth at about 3 am.*

*By the end of August when the two planets are closest, Mars will rise at nightfall and reach its highest point in the sky at 12:30 a.m. That's pretty convenient to see something that no human being has seen in recorded history. So, mark your calendar at the beginning of August to see Mars grow progressively brighter and brighter throughout the month. Share this with your children and grandchildren. NO ONE ALIVE TODAY WILL EVER SEE THIS AGAIN.*

For the most part, all of this was true ... in 2003. The line about Mars looking as large in an eyepiece as the full moon looks to the naked eye is problematic for various reasons, not the least of which, it directly leads to the false statement in the hoax email that Mars will look as big as the full moon. Some simple trigonometry tells us that if Mars appeared the size of the full moon we would be in some serious trouble. We know the diameter of Mars is about 6794 km. The apparent diameter of the full moon is about .5 degree. If we take half the diameter of Mars, 3397 km and divide by the tangent (opposite over hypotenuse) of half the apparent size of the moon .25 degree we get a distance of 778,530 km. In other words, Mars would sit a little more than twice as far away as the moon. Very bad stuff. Another mystery the hoax email leaves unexplained is how Mars pops from 35 million km to 779,000 km at 12:30 am and then back to 35 million km a minute later. Oh yeah, it can do that because it's all baloney.

**The Beagle Society offers an opportunity to be a part of community of individuals with an abiding interest in all the sciences.**

**For an annual membership fee of \$25.00 per person or \$40.00 per household, members will be able to participate in events, presentations, lectures, workshops, trips and other, unique experiences. Through the Beagle Society, members can further their interests and satisfy their curiosities in everything from Astronomy to Zoology.**

**Bimonthly meetings are held on the third Monday at 7:00 PM in February, April, June, August, October and December. Each meeting focuses on a different science-related subject.**

**Other events, including field trips, will be scheduled throughout the year. Each meeting includes a *Free-Range Science Discussion* where all opinions and comments are welcomed.**

# New Darwin Books at the Beagle

Compiled by William Nedblake

As you'll know by now, 2009 is the bicentenary of Charles Darwin's birth, and the 150th anniversary of the publication of his seminal work, *On the Origin of Species*.

As HMS Beagle is - of course - named after the Royal Navy survey ship on which Darwin sailed from 1831-37, it's more than appropriate that we celebrate this anniversary in a big way - with some of the raft of bicentennial books and classic editions of Darwin, his life, and his work.

## Some of these new books include editions of Darwin's work, including:

*Autobiographies* (Penguin Classics, ISBN: 978-0140433906, \$12.00) - the autobiographies of Darwin, edited and with an introduction by Michael Neve and Sharon Messenger.

*The 'Beagle' Letters* (Cambridge University Press, ISBN 978-0521898386, \$32.00) - an illustrated collection of letters to and from Darwin during his time aboard HMS Beagle. Introduction by Janet Browne, edited by Frederick Burkhardt.

*The Descent of Man* (Penguin Classics, ISBN: 978-0140436310, \$17.00) - the 1871 follow-up to Darwin's 1859 effort, *On the Origin of Species*. In *Descent*, Darwin tackles the still-more controversial implication of his theory, the evolution over time of humanity. Text from the definitive second edition, with an introduction by Darwin biographers James Moore and Adrian Desmond (qv.), with suggestions for further reading, a chronology, and biographical sketches.

*On Natural Selection* (Penguin Books: Great Ideas Series, ISBN: 978-0143036302, \$10.00) - selections from *On the Origin of Species*, including the Struggle for Existence, Natural Selection, and Difficulties of the Theory.

*On the Origin of Species* (Signet Classics, ISBN: 978-0451529060, \$6.95) - the seminal classic, now in an inexpensive edition based on the second edition (1860) of the *Origin*. With an introduction by Sir Julian Huxley, and glossary.

*Origins: Selected Letters of Charles Darwin, 1822-1859* (Cambridge University Press, ISBN 978-0521898621, \$28.00) - letters to family and colleagues reveal Darwin's character and personality, and his struggles which lead to the difficult naissance of evolutionary theory. Edited by Frederick Burkhardt, with a Foreword by Stephen Jay Gould.

*The Portable Darwin* (Penguin Books, ISBN 0-1401511095, \$17.00) - want your Darwin to go? You only need this selection from Darwin's writings, including five chapters from *On the Origin of Species*, extracts from *The Voyage of the Beagle*, *The Descent of Man*, and *The Variation of Animals and Plants*. Also includes scientific papers, travel writings, letters, a family memorial; plus chronology, bibliography, an introduction, notes, and an epilogue. Edited and introduced by Duncan M. Porter, and Peter W. Graham.

*Voyage of the Beagle* (Penguin Classics, ISBN 978-0140432688, \$14.00) - an excellent standard edition of Darwin's surprise Victorian best-seller, the *Journal of Researches*. Edited and with an introduction by Janet Browne (Darwin biographer and scholar) and Michael Neve.

## New critical and biographical works include:

*The Cambridge Companion to the "Origin of Species"*, edited by Michael Ruse and Robert J. Richards (Cambridge University Press, ISBN 978-0521691291, \$28.99) - an invaluable collection of essays about and around Darwin's central work. *Charles Darwin: The Man and His Influence*, by Peter J. Bowler (Cambridge University Press, ISBN: 0-521566681, \$34.99) - this reprint of Bowler's 1990 work discusses not only the factors which guided Darwin's writing, but the critical and scientific reception and the motivations of some of his most vocal proponents and critics.

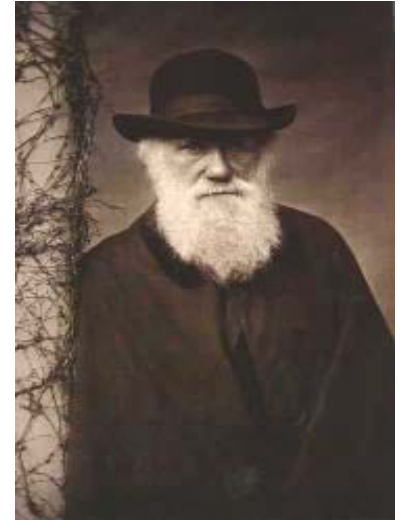
*Darwin's Sacred Cause*, by Adrian Desmond and James Moore (Houghton Mifflin, ISBN 978-0547055268, \$30.00) - a fascinating new account of how Darwin's vehement distaste for slavery moulded his views of human evolution. This landmark book is the follow-up to Desmond and Moore's 1991 biography, *Darwin*.

## For young readers:

*Darwin, with Glimpses into His Private Journal & Letters*, by Alice B. McGinty, Illustrated by Mary Azarian (Houghton-Mifflin, ISBN: 978-0816995318, \$18.00) - a delightfully written and illustrated introduction to Darwin's voyages and discoveries.

*What Mr Darwin Saw*, by Mick Manning and Brita Granstrom (Frances Lincoln Children's Books, ISBN 978-1845079703, \$17.95) - voyage with Darwin and discover how one of the greatest of all scientists unraveled the secrets of evolution.

In addition, be certain to look for books by some of the greatest exponents of evolutionary biology, including Richard Dawkins, Donald Prothero, Sean B. Carroll, and the late, much-lamented Stephen Jay Gould. And remember - Beagle Society Members save on books every time you shop at HMS Beagle and HMS Beagle Online ([www.hms-beagle.com](http://www.hms-beagle.com))!



## What's Up This Month

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Leif Bahl, Beagle Staff Astronomer

I've enjoyed looking at some globular clusters in the past few weeks. Globulars are unbelievably dense giant spheres of hundreds of thousands to millions of stars. These ancient, brilliant denizens of the galaxy tend to orbit – unlike the rest of the well-behaved stars in the disk of the Milky Way – any which way they choose, often traveling far above and below the plane of the galaxy. With a small telescope or even binoculars you can catch a few of these old star spheres this month.

**M53** is a wonderful star cluster and fairly easy to find. William Herschel described M53 as one of the most beautiful sights in the heavens and I agree. First find Alpha Comae Berenices, the brighter star above the north end of the “bowl” of Virgo. M53 lies less than a degree away toward the northeast. Binoculars easily reveal M53, which will help if you have trouble getting it in the eyepiece of a telescope. M53 is a “must see” object.

**M13**, or The Great Hercules Cluster, lies on the western edge of the “Keystone” asterism of the constellation Hercules. This cluster far exceeds in apparent size and grandeur all other globular clusters in the northern skies. A six-inch or larger telescope brings to view a “hairy” M13, as John Herschel describes it, with many curving arms of

stars spreading out from the center. Stephen James O'Meara writes, “From dark skies and in good conditions, M13 is easily spotted as a fuzzy ‘star’ with the naked eye, though it can be seen as a perceptible glow even through a light fog.” As a favor to yourself, do not miss looking at M13 every time you go out. First locate the constellation of Hercules between the constellations of Lyra (marked by the brilliant star Vega) and Boötes (marked by the bright red star Arcturus). The main part of Hercules, a keystone-shaped asterism, stands not far from Vega. As mentioned, M13 lies between the two western stars of the “Keystone,” about a third of the way from the northern of the two stars.

Now we move to some globulars of the harder-to-find variety. **M3** floats half-way between the straight-line constellation of Canes Venatici and the aforementioned Arcturus in a relatively empty part of the sky (it may be a little closer to Arcturus than Alpha Canum Venatici). It forms an equilateral triangle with M53 and Arcturus. A large, fully-packed cluster, M3 consists of a bright center that gradually fades to the edges. O'Meara writes, “The cluster's core appears bulbous and its edges flat and sprawling.” He also describes the cluster as one of the most colorful, claiming to see yellows and blues  
*(Continued on next page)*

## What's Up This Month

*(continued)*

in the cluster, even a peach tint toward the center. What colors do you see in this gem?

Last we have the most difficult of the four clusters to find, **M5**. M5 hangs approximately half-way and south of a line between Arcturus and Yed Prior in the large but somewhat dim constellation of Ophiucus. Some scanning around with binoculars may help in finding this absolutely spectacular globular. I'll let O'Meara describe it, "The fifth object in Messier's catalogue is a powerful and dynamic sight in small telescopes. Even at low power it is a slightly stellar conflagration with a blazing heart. A wide and loose, slightly elliptical exterior becomes increasingly tight toward a star-like center. The cluster looks as if it is collapsing under the force of gravity, triggering atomic reactions in its core. And with a 7-mm, the entire cluster seems electric, bursting with fiery sparks." Now if that description doesn't get you to drag your 'scope out, I don't know what will. Happy hunting.



The Beagle Society e-newsletter is a publication of H.M.S. Beagle. Contributions are always welcome.

Editors: John Kuhns, William Nedblake, Leif Bahl, and Carol Kuhns

All comments and contributions should be sent to H.M.S. Beagle at [clk@hms-beagle.com](mailto:clk@hms-beagle.com).

### Planets this month:

**Saturn** stands high in the early evening western sky under the feet of Leo. Saturn's rings continue to tilt more edge-on from our point of view. Saturn increasingly looks like a ball with a stick through it. Look for the ruddy star-like object in line with Saturn's rings in the eyepiece. That's the moon Titan.

**Jupiter** rises around midnight. Aside from the usual impressive offerings of the solar system's largest planet, Jupiter guides us to **Neptune** only  $\frac{3}{4}$  of a degree to the northwest. Neptune shines at 8<sup>th</sup> magnitude, making it an easy catch in binoculars as a blueish star-like object. At magnifications over 200x Neptune can be seen as a tiny blueish dot rather than a point of light.

**Uranus** rises a little after 1 am and, at 5.85-magnitude, from a dark location, can be seen with the unaided south of the "Circlet" of Pisces.

**Venus** and **Mars** rise in tandem a little after 3 am. Tremendously brilliant Venus points the way to less-than-slightly-brilliant Mars about 2 degrees to its left or upper-left.

Feeling unchallenged and a little crazy? Just try to find **Pluto** with a ten-inch or larger 'scope to the north of the "Lid of the Teapot" in the constellation of Sagittarius. Pluto looks like a dim star and sits in a field thick with virtually identical dim stars. So be sure to get a hold of a good, detailed finder chart before starting this quixotic endeavor.

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