

BCSFazine #357

\$3.00

Vol. 31 No. 2

February, 2003



In this issue:

* I THINK YOU OUGHT TO KNOW I'VE BEEN FEELING TERRIBLY DEPRESSED *
* MORE ZINE REVIEWS, FILM REVIEWED, MEDIA RUMOURS, AND FAN NEWS *
* HERE I AM, BRAIN THE SIZE OF A BLOODY PLANET ... *
* NO WARS, RUMOURS OF WARS, OR EVEN DIFFERENCES OF OPINION;
ALL IS SWEETNESS AND LIGHT IN THIS ZINE *
* I'M NOT BORING YOU AM I? *

Colophon

BCSFAzine -- *Something to ~~offend~~ interest everyone!*

BCSFAzine © February 2002, Volume 31, # 2, Issue #357 is the club newsletter published by the B.C. Science Fiction Association, a social organization. Single copies \$3.00 each. For comments, subscriptions, suggestions, and/or submissions, write to: *BCSFAzine*, c/o Box 15335, VMPO, Vancouver, B.C. CANADA V6B 5B1, or email hrothgar@vcn.bc.ca.

BCSFAzine is distributed monthly at WHITE DWARF BOOKS, 4368 West 10th Avenue, Vancouver, B.C. V6R 2H7, tel. 604-228-8223; email whitedwarf@deadwrite.com

BCSFA's Web page may be viewed at <http://www3.telus.net/dh2/bcsfa/>

BCSFA's e-mail discussion list may be joined by emailing

BCSFA-subscribe@yahoogroups.com

To post a message, email BCSFA@yahoogroups.com

To contact the list owner, email BCSFA-owner@yahoogroups.com

To unsubscribe, email BCSFA-unsubscribe@yahoogroups.com

The shortcut URL to this list is <http://www.yahoo.com/community/BCSFA>

F.R.E.D., the weekly gathering of BCSFAns and all others interested in coming, happens every Friday at 8:00 p.m. at the Jolly Alderman Pub, 500 West 12th Avenue (entrance on Cambie Street, just south of 12th Avenue), in the ground floor of the Plaza 500 Hotel (diagonally across from Vancouver City Hall).

The V-Con Society Web page may be viewed at <http://www3.telus.net/dh2/vconsociety/>

Graeme's **Canfancylopedia** page can be viewed at <http://members.shaw.ca/rgraeme/home.html>.

Andrew Murdoch's **Canfandom** page can be viewed at www.fandom.ca.

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Above prices include subscription to *BCSFAzine*. Make cheques payable to WCSFA (West Coast Science Fiction Association), c/o 86 Warrick Street, Coquitlam, B.C. CANADA V3K 5L4.

BCSFAzine is also available by e-mail; please email the editor at hrothgar@vcn.bc.ca if you wish to receive our newsletter this way.

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Art Credits

Taral Wayne (cover, again)

Michael Morbius (interior illustrations)

Plain Speaking

My father said, "When you have nothing good to say, say nothing."

LoCs

Michael Morse, December 28, 2002

Colophon: "Anyone else want to draw for me??" One of my students is a very good fanartist. I've passed along your contact information.

Plain Speaking: "More Columns Wanted": There's a few things I could try to go on about. You've already suggested that I write about the "funny animal" comic boom of the mid-eighties, which I'll do. I could also send more Sci-Fi Wire articles your way. Ryan also reads news sources that I don't, such as the official Star Wars web site and *Toyfair* magazine.

* "...two decades ago...Taral Wayne...suggested that by now most fans would have turned to producing fanzines by fax machine." In 1991, local professional artist and fan Mike Jackson made a bet with one of his friends that by the year 2000 cellular phones would be as common as VCRs. It was hard to believe back then. Would you say he was right?

LOCs: [Lloyd Penney] "...mundanes can be like fans for a night..." This is also what Goths say about Hallowe'en.

* [Lloyd Penney] "Hello Michael...give .pdfing your zine a try, and get the word out as much as you can. Publishing is important, and getting some feedback on what you do will give you lots of information on what to change, or what to keep as it is." Have you had a chance to check out the web version of *Hero of the Beach*? Thanks again for the advice and encouragement. :)

Advertisements: I haven't been to White Dwarf Books in a long time. I remembered yesterday that that's where I found the recruitment flyer for the USS Resolution in 1988.

(Editor responds: please note White Dwarf's new address, still on West 10th but now near Alma St.)

News-Like Matter: "Scrotal Asymmetry": *(laugh)*

* John Cleese writing a Superman comic: Cool! This reminds me of Lord Bravery, a character on the mid-nineties Warner Bros. cartoon *Freakazoid* (a follow-up to *Tiny Toon Adventures* and *Animaniacs*). Lord Bravery had the powers of Superman, but looked and sounded John Cleese. He divided his time between saving hapless Britons from life-threatening situations and muttering through his tea at his Sybil Fawltly-esque wife in their tiny flat.

Things You Should Know About Fanhistory: Fascinating article! I'm going to re-read it a few times to soak up all the info.

* "Vancouver fans bid for and won the right to hold Westercon 30, in 1977. This drew fans from all around the Pacific Northwest..." Impressive. Vancouver Transfans have been told repeatedly that Botcon, the main Transformers convention, will never, ever be held in Vancouver because the company that does Botcon doesn't want to deal with Canadian currency.

(Ignorant jamtarts, says I.)

Lloyd Penney lpenny@dbrs.com January 7, 2003

I've got a perfect printout of *BCSFazine* 356 in front of me, and time allows for a loc. Stranger things have happened, and one of those things might just happen now.

I've been in fandom 25 years now, and I've tried to read as much about it as I can get my hands on. In fandom's 70+-year history, it's gone from a bunch of nerdy kids relieved to find out they weren't the only ones reading that Crazy Buck Rogers Stuff, to tens of thousands of fans who exercise their creativity and interests in a SFnal fashion. (The nerdy kids are still there, but they are better tolerated, and they are now overshadowed by those with talent and skill.) There is so much now connected with fandom, our diversification is now seen as our downfall by some, and our evolution by others. I shall set the readers a task for voting and writing... is the diversification of fandom into myriad interests good or bad? Explain your reasons. (This will count for 75% of your final mark.) I see, Garth, that you detail similar ideas later on in the zine. I hope this will spark some construction discussion.

SF has a lot of fresh ideas in it; they may not be fresh to those of us who have been in the field for a long time. Perhaps SF has an objective best before date. After a while, we begin to see duplications in themes, plots and characters, and this neat field of literature begins to look stale. Those who are still new still have a little sensawunda with which to enjoy the field. If SF truly was a fount of perpetually new ideas, the way we'd like it to be, it would have been purchased by big business long ago to see what profitable ideas it would come up with next. Time to return to reality...science fiction has always been a commercial product, and shall remain so. We buy it until we tire of it, and then we buy another product. Fortunately, it has a long (but not infinite) shelf life.

Tara is right, Mike Glycer seems to be unreachable these days. I think we're all faunching for a new issue of *File 770*. I think Mike's put these SFnal projects on the back burner because he's a happy dad, raising his new daughter.

Information about Bouchercon 35 is still sketchy, but chairman Al Navis is putting together a preliminary guest list, and the committee should be put together in a few months. B35 will take place at the Metro Toronto Convention Centre and adjoining Crowne Plaza Hotel in downtown Toronto

October 7- 10, 2004. Again, more details as they become available.

A lead on some breaking news...I've been able to confirm through reliable sources that Bakka Books in Toronto is for sale, and that it may soon be sold to a professional romance writer and her husband. No details from John Rose, Bakka's current owner; I imagine John will make his announcement when he's ready.

I see the announcement of two Canadian entries into the XPrize Foundation's competition. Yvonne is now quite busy with the XPrize, now being the senior Canadian organizer for any launches that may take place over the next year, and she's written their procedural manual for any PR and management of the launch event. It looks like both Canadian entries are well on their way to being ready to launch, and odds are good they may actually win the prize.

Vancouver in 2011...this is indeed a long-term commitment to this kind of event. I would recommend that you get in touch with John Mansfield (ConAdian) and Larry Hancock (Torcon 3) to see how they set up their respective corporations, and follow the path already trodden. I had thought to offer some assistance, but I hope to be out of convention management long before then.

((This, I take it, is meant for the person who is actually proposing the bid.))

Garth, you say that Dick Smith is writing a history of fandom in the 1960s. Actually, it is Richard Lynch (one of the editors of *Mimosa*) who is writing it. It is still in the preliminary stages; I wouldn't expect to see the book before 2005.

((Congratulations: you are the 35th person to point this out.))

Finally, through correspondence with Don Bassie, he is planning to add changes to his Made in Canada website quarterly instead of the previous monthly.

I've written this up at work through various interruptions, so the whole thing might not be too coherent. At least I tried to get through it and respond. I look forward to the next issue, so see you then.

Advertisements

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Our Calendar of Events

February 2003

Feb. 1: **Chinese New Year** (Year of the Goat). Steamboat invented in 1788 on this date.

Feb. 2: **Groundhog Day**.

Feb. 3: Flush toilet invented (1837).



Feb. 8: **Emperor Norton Day** (San Francisco). The fountain pen invented (1863).

Feb. 8, 7 p.m.: **Second Saturday Feeding Frenzy** at Foggy Dew Irish Pub, 405 North Road, Coquitlam. One block east of the Lougheed Mall Skytrain Station AND in a locale with lots of parking. The food is really good too. Much like that you would encounter at the Jolly Alderman, BUT WITH MORE CHOICES!

Feb. 10: anniversary of the invention of the zipper (Canada, 1925).

February 13 @ 7pm: BCSFA Book Discussion Group at BLENZ Coffee, 2506 Granville St., Vancouver (corner of Broadway and Granville). Books up for discussion are *American Gods* by Neil Gaiman and *The Quantum Rose* by Catherine Asaro. None of us could think of any books that are more popular with readers, so we picked last year's Hugo Winner (*American Gods*) and last year's Nebula Winner (*The Quantum Rose*).

Feb. 14: *BCSFAzine* deadline; St. Valentine's Day.

Feb. 14-16: **Radcon 3C** in Pasco, Washington; a general SF convention, with a gaming emphasis. GoH: tentatively R.A. Salvatore; guest, NeNe Thomas. Radcon 3C is sponsoring a Westercon 52 bailout fund. See www.radcon.org.

Feb. 21-23: **Potlatch 12** at the Ramada Plaza Hotel in San Francisco. For readers and writers of speculative fiction, proceeds to benefit Clarion West. Book of Honor: *The Rediscovery of Man* by Cordwainer Smith. Featuring conversations, ideas, and books. The Ramada Plaza room rates are US\$99/night, and reservations may be made at 888-298-2054 (mention Potlatch). Membership \$40 to Feb. 8/03, \$45 at the door. Make cheques payable to Clarion West/Potlatch 12. Write Potlatch 12, 6405 Regent St., Oakland, CA 94618, or email info@potlatch-sf.org, or see www.potlatch-sf.org.

Feb. 21-23: **RingCon** at the Inn at Gig Harbor, Washington; A family-oriented Middle Earth convention, Artists Brian Snoddy, RK Post, Margaret Organ-Kean, Drew Hilstad, and musician Heather Alexander. Hours: Friday 4-9 p.m.; Saturday 10 a.m. to 1 a.m. Sunday; Sunday 10 a.m. to 3 p.m. Featuring seminars on composition and story development, on reading runes, and on costuming. The Inn at Gig Harbor can be contacted at 3211 56th St. NW, Gig Harbor, WA 98335, or tel. (253) 858-1111. Advance registration at Norwescon (see below: Norwescon rate \$20) and Washington Renaissance Fantasy Faire (Aug 2, 3, 9, 10/03). Memberships \$25 in advance, \$30 at the door, \$15/day; To order tickets mail to WRFF, Inc., 12016 134th Ave., KPN, Gig Harbor, WA 98329 or email info@ringcon.com; for more information, see www.ringcon.com.

Feb. 23: **Portland Comic Book Show** at the Memorial Coliseum, featuring Linda Harrison (*Planet of the Ages*), Randy Emberlin (Marvel Comics), Linda Medley (*Castle Waiting*), Andy Mangels (writer of movie articles & books), Leland Purvis (*Pubo*, Dark Horse Comics). Admissions \$6; call Second Genesis at (503) 788-1031.

Feb. 28: **Dinner / Fundraiser** for "Bolts of Fiction", The Vancouver Society of Storytellers and The Carnival Band, at the W.I.S.E. Hall, 1882 Adanac Street (near Venables and Victoria Drive), Vancouver, B.C. Featuring a Chinese feast, "Tales of the Arabian Nights", musical dramatized readings, a dance with music by the Carnival Band. Tickets: \$20.



Sweetness and Light

DONNA AT THE BAR

"NOMINEES FOR THIS YEAR'S Philip K. Dick Award, given annually for distinguished science fiction published in paperback original form in the United States, have been announced. The Philadelphia Science Fiction Society sponsors the Philip K. Dick Award. Judges for this year's award are Michael Blumlein, Shelley Rodrigo Blanchard, Nalo Hopkinson (chair), Donna McMahan, and Lois Tilton.

- * *Empire of Bones*, Liz Williams (Bantam Spectra)
- * *Leviathan Three*, Jeff VanderMeer & Forrest Aguirre, eds. (The Ministry of Whimsy)
- * *Maximum Ice*, Kay Kenyon (Bantam Spectra)
- * *The Mount*, Carol Emshwiller (Small Beer Press)
- * *Report to the Men's Club*, Carol Emshwiller (Small Beer Press)
- * *The Scar*, China Miéville (Del Rey)
- * *Warchild*, Karin Lowachee (Warner Aspect)

"First prize and any special citations will be announced on Friday, April 18, 2003 at Norwescon 26 in Seattle, Washington."
DarkEcho #18, Jan. 10, 2003

TORCON 3 SEZ in their third progress report (Sept. 2002):

Torcon 3 Wins Convention Bid

"At the Con-Version [last] August, Torcon 3 successfully won its bid to host the Convention in 2003. Held annually, the

Convention is a national science fiction event that is hosted in conjunction with other Canadian conventions on a rotation basis. The primary function of a Convention is to administer and present the Auroras (annual Canadian national science fiction and fantasy awards), as well as to hold the annual CSFFA business meeting. Constitutional restrictions restrict voting to Canadian citizens, not necessarily living in Canada, and to permanent residents.

(ConAdian, held in Winnipeg in 1994, was the first Canadian Worldcon also to host Convention; Torcon will be the second.)

The 2003 Hugo Awards

"The year 2003 marks the 50th anniversary of the first Hugo Awards presentation in 1953 at the 11th Worldcon, popularly known as Philcon II, in Philadelphia. (The Torcon 3 Hugo Awards Ceremony will actually be the 49th ceremony since awards were not given out in 1954.)

Weapons Policy, in brief

"To sum up: No real or real-looking edged or projectile weapons will be allowed in the convention areas, except at the Masquerade once approved by the Masquerade Head.

[A full weapons policy will be forthcoming in a later Progress Report. -ed.]

Shipping News: Exhibitors Take Note!

"Torcon3 has appointed Schenker of Canada Ltd. as our "Official Customs Broker & Freight Forwarder" for the annual congress. Schenker will provide dealers, artists and other interested parties with a customized written quotation for both customs brokerage and door-to-door transportation. Schenker is very experienced worldwide in coordinating logistics for special events. Schenker will provide you with a door-to-door customized written quotation for both customs brokerage and transportation. ...

"For more information please see www.schenker.ca and look under services and conventions and exhibitions.

Torcon 3 Lost Members:

- . Ahlers, Michael J - Cincinnati, Ohio
- . Boyle, Bridget - Highland Park, New Jersey
- . Chau, Wayland - Hamilton, Ontario
- . Cole, Anita L - NMB, Florida
- . Duncan, Emma - Toronto, Ontario
- . Gill, Peter - Vancouver, British Columbia
- . Goetz, Jim - Petawawa, Ontario
- . Konoya, Hiroshi - Old Bridge, New Jersey

- . Matheson, John - Newport News, Virginia
- . Salter, David Ian - Richmond, California
- . Score, David - Ft Huachua, Arizona
- . Webber, Bob - Maldon, Massachusetts
- . Wong, Peter - San Francisco, California
- . Wood, Shannon - Chicago, Illinois

Write to: TORCON 3, PO Box 3 Station A,
Toronto, Ontario, M5W 1A2 Canada.

Torcon 3 Progress Report number 3

URSULA LE GUIN was chosen this month as SFWA's twentieth Grand Master, with a formal presentation to follow at the Nebula ceremony in April. Her first sf story appeared in 1962.

ANSIBLE 186, January 2003

Agent, Author Kidd Dies

"Virginia Kidd, an agent, SF author and anthologist, died Jan. 12 after a long illness, the *Locus* Online Web site reported. She was born in 1921. ...

"Since the 1960s, she was best known as a literary agent; the *Encyclopedia of Science Fiction* notes that 'she become known for her feminist views and although she did not handle only women writers; for representing a highly capable range of feminist authors, including Carol Emshwiller, [Ursula K.] Le Guin, Josephine Saxton and James Tiptree Jr.'"

Michael Morbius, Jan. 14, 2003



EMILY SOMMA clarifies Great Ormond Street Hospital's attempts to block US publication of her *Peter Pan* sequel *After the Rain*:

"The reason why there is no issue in Canada is because the GOSH didn't apply for an extended copyright here for the 1904 play (*Peter and Wendy*). So, in Canada, all of Barrie's works (including the play) are public domain. In the US though, the GOSH has an

extended copyright on the play until 2023. I think that by US copyright law, if my work was a similar expression to the play ... which it's not ... but if it were, the GOSH could ask for royalties. (And actually I did offer them royalties from the outset ... not because I had to ... but as a goodwill gesture.) Legally though, they can't block a publication, or order someone to "cease and desist" as they did to me because they felt (and expressed in writing) that my book created or creates unfair competition for them. I think I can tell you this, because this part is already out in the open."

ANSIBLE 186, January 2003

Habitable Planets May Be Common According To Computer Modelling

"According to two astrophysics researchers at Princeton University, one in four planets of the 85 star systems they analyzed may fall into the habitable range.

"However, their research is not based on observation but on statistical analysis.

"Their reasoning for doing such analysis is included in the abstract of the paper presented.

"Here's the research paper and *New Scientist* article that reported it, as well as a quote reprinted from *Asian News International*.

"Dynamical Habitability of Known Extrasolar Planetary Systems"

Kristen Menou, Serge Tabachnik
Paper by researchers involved:

<http://arxiv.org/abs/astro-ph/0210006>

"Habitable Planets May Be Common"
New Scientist article quoted in Yahoo UK News:

<http://uk.news.yahoo.com/030103/12/dht21.html>

"Researchers - Every Fourth Planet May Have Life"

Report by *Asian News International* quoting NS article:

<http://www.rense.com/general33/ev.htm>
(to BCSFA listserv via S.H. Kawamoto,
January 8, 2003)

Edge Publishing Sez:

"EDGE Science Fiction and Fantasy Publishing was delighted to be a part of ConVersion 19 / CanVention 22 on August 9-11, 2002. We held the Book Release Party for *Throne Price* by Lynda Williams and Alison Sinclair on the evening of the 10th. Both authors were present to do readings and signings, as well as chat with the party

goers about the novel. Marie Jakober was also in attendance that weekend, and all three women were members of various panels and discussion forums during the convention.

"EDGE Science Fiction and Fantasy Publishing is pleased to announce the Spring, 2003 release of *Throne Price*. We would also like to take this opportunity to tell you about the next two novels for 2003. *Kean* by Till Noever will be available in Summer, 2003, and *Orbital Burn* by Adrian Bedford is scheduled for Fall, 2003. We are very excited about this year's very diverse, very eclectic selections."

EDGE SF/F Publishing
sales@edgewebsite.com, January 7, 2003

Lisez-vous en français?:

"Following last year's successful licensing arrangements with Penguin Putnam (for paperback editions) and the Science Fiction Book Club (for book club editions), EDGE Science Fiction and Fantasy Publishing has licensed a French language edition of Marie Jakober's *The Black Chalice* to Quebec publisher Editions Alire.

"Alire publishes French language versions of works by Élisabeth Vonarburg, Guy Gavriel Kay and others. We anticipate that their edition of *The Black Chalice* will be released in approximately two years. You can check out their web site at <http://www.alire.com>."

Contact Kimberly Gammon:
sales@edgewebsite.com
403-254-0160 (voice)
403-254-0456 (fax)

EDGE SF/F Publishing
sales@edgewebsite.com, January 14, 2003

GLITTERING PRIZES

"Philip K. Dick Award for US paperback originals: here's the shortlist. Carol Emshwiller, *The Mount* and *Report to the Men's Club and Other Stories*; Kay Kenyon, *Maximum Ice*; Karin Lowachee, *Warchild*; China Mieville, *The Scar*; Jeff VanderMeer & Forrest Aguirre (ed.), *Leviathan Three*; Liz Williams, *Empire of Bones*."

ANSIBLE 186, January 2003

GOTH HOUSE NEWS

<http://www.gothhouse.org>

Julie McGalliard Sez Goth House "comes in single-panel and full-page versions, based on your connection speed and monitor size..."

"Cool news # 1: The new issue of *Talebones* is out with my dark fantasy story, "Flowers of the Sorcerous Moon." *Talebones* is put together by Patrick and Honna

Swenson, who did such a beautiful job on the 2001 World Horror Convention souvenir book. Get one! Get lots!

"Cool news # 2: Barb Lien-Cooper's *Sequential Tart* interview with me is up: http://www.sequentialtart.com/indy_0103.shtml

This is part of their "Declaration of Independents" series.

"And more cool stuff, Feo Amante published my review of *Hell House* on his website:

http://www.feoamante.com/Movies/GHI/Hell_House_documen.html

"There's just no escaping me this month. Talk to you again on January 24."

Julie McGalliard, *Goth House Newsletter*,
Jan. 10, 2003

Fanfundery.

GUFF: John Foyster's 1979 GUFF trip report *Stranger in Stranger Lands* (print edition 1996) can now be read on line in all the glory of its Second Edition, at:

<http://efanzines.com/JFGUFF/index.html>

ANSIBLE 186, January 2003

Subterranean Press Sez:

"... We've been working on some titles we're now ready to announce..."

"*Grrm: A Retrospective* by George R.R. Martin -- A mammoth collection, including a ton of never before collected and unpublished material. The finished book will be over 1,000 pages!

"*The Devils in the Details* by Tim Powers and James P. Blaylock -- An entire collection of all original stories, written solo and in collaboration, each illustrated by Phil Parks.

"*Night Visions 11* edited by Bill Sheehan -- Brand new novellas by Lucius Shepard, Kim Newman, and Tim Lebbon.

"*Colonel Rutherford's Colt* by Lucius Shepard -- A full length novel, exclusive to SubPress."

<http://www.subterraneanpress.com>
Subterranean Press, Jan. 8, 2003

C.O.A.

Andrew I. Porter and Algol Press, 55 Pineapple St #3J, Brooklyn, NY 11201-6846, USA: "My Post Office is moving in January, and in an effort to achieve maximum confusion, they will renumber all the P.O. Boxes. Faced with that plus much less volume of mail in the post-*SF Chronicle* days, I will close the box, whatever the new number, in April."

ANSIBLE 186, January 2003

Fanzines

By Ted White

Fanzines are a basic part of science fiction fandom, having been in existence as long as fandom itself – the past 70 years. Fanzines are a reflection of many fans' interest in the printed word and amateur publishing. The publication you are reading this in is a fanzine, but a specialized one. A variety of other fanzines are also available – many of them by request – and this column will cover some of them each issue.

All fanzines are published as a hobby and lose money. Their editors appreciate money to defray their expenses and sometimes list single-copy or subscription prices, but they appreciate even more your written response – a Letter of Comment, or LoC. Feedback – better known in fandom as “egoboo” – is what fanzine publishing is all about.

Check out the fanzine below and broaden your participation in fandom.

WASSAMATTA U. (Randy Byers, editor & author, 1013 North 36th, Seattle WA 98103; e-mail to rbyers@u.washington.edu; available to promote Byers' TAFF candidacy – but send at least a dollar to cover the postage)

One of fandom's unique traditions (starting in 1953) is the Trans-Atlantic Fan Fund which exists “for the purpose of providing funds to bring well-known and popular fans familiar to those on both sides of the ocean across the Atlantic” to a major convention – the Worldcon, if possible. The TAFF alternates, bringing overseas fans to the U.S. and then sending U.S. fans abroad – usually to the U.K. The fan who is thus funded is one who has won an election and after he or she wins and takes the trip, the winner takes over the administration of the fund from the previous winner on the same side of the Atlantic. There is also the tradition (unfortunately honoured as often as not in its breach) of writing and publishing a trip report. These are known as “TAFF Reports.”

Fans become well-known and popular and familiar to those on both sides of the ocean largely via written communications – fanzines and the Internet newsgroups and e-lists that have grown up over the past decade.

This year the candidates for the trip to the U.K. are three Americans and one Canadian, all of whom are known and liked and capable. They are Randy Byers, Colin Hinz, Mike Lowrey and Curt Phillips. I will be happy with whomever wins. But Full Disclosure requires me to admit that I am one of Randy Byers' nominators.

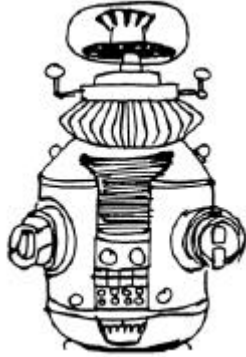
And Randy has done something I'd like to see all TAFF candidates do: He has published a collection of his own fanwriting, covering a full decade of work. *Wassamatta U.* is a 36-page fanzine, very simply but attractively designed by Carl Juarez (who is one of those guys who doesn't want his name capitalized), containing 13 of Byers' pieces, plus an introductory “editorial.”

“In the short term – such as it is – this collection is a promotional tool for my 2003 TAFF campaign,” Byers states in that editorial. “I thought that voters might be interested in a sampling of my writing to help them make up their minds one way or another. ...There are a couple of con-reports here that should give you an idea of what my TAFF trip report would be like. I think you'll find my writing full of fantasy, good humour, and near-hallucinatory levels of bewilderment, but grounded in a terse, sweaty fear of love and death. Just the qualities one looks for (and finds) in a TAFF candidate, I'm sure you'll agree.”

There's a lot of excellent writing in *Wassamatta U.* Byers tells strange tales of encounters with fans and ruminates on what “fannish” really means. He reviews a book (Gwyneth Jones' *North Wind*) and considers a proximate death. He wends words in personal but meaningful ways. *This* is what fanwriting is all about. If TAFF didn't exist this would still be one of the top fan publications of the year.



Media File



Doctor Who: New Hope or Is It Too Late?

Ray Seredin

New management at Viacom-Universal Entertainment has brought new hope to both the BBC and Who Fans worldwide.

Word is that Viacom-Universal is considering picking up the BBC-produced version of the new series to air on the studio-owned "Sci-Fi Channel" in the U.S., if the BBC and its still-unnamed new international partner can prove that their version can draw in the same, or a larger audience than the Viacom-Universal version rejected by the BBC last summer.

There's also the possibility that "The Doctor" could end up on a Disney-run media outlet.

The Disney-owned ABC network is considering merging its news division with BBC News (**Note**: which became an independent company, owned by the BBC, on December 3rd, 2002). Although entertainment programming is not on the table, it has not been ruled out as being part of a future deal.

Disney knows first-hand the popularity of "The Doctor" in Great Britain. In 2000 the studio bid to co-produce a number of feature films with BBC Film Studio, with a series-based movie rumored to be among them, and for a few days the London tabloids went wild with casting ideas of a big-screen "Doctor". However, after ferrying a planeload of BBC executives to L.A. and back, both studios announced that "Dr. Who" was not part of this deal.

So here are another two chances to see the series as we knew it; however, it may already be too late.

One of the producers of the *Back to the Future* trilogy told a Who Fan that the time to bring "The Doctor" back to America has come ... and gone.

He went on to say that, in early 1990, about 165 PBS stations across America, which could access around 85% of the population, were showing "Dr. Who" at least once a week. This, and the success of the *Back to the Future* trilogy, would have made this the perfect time to bring the series into the American mainstream, so that June, Amblin Entertainment approached the BBC about a possible partnership with the series.

Yet the BBC said they couldn't talk about a new TV series until a deal to make a "Dr. Who" feature film was either fulfilled or had expired. Amblin then approached the filmmakers, who wanted an immense amount of money for the film rights.

The next move didn't happen until July 1994, when film rights expired. At that time Amblin, Universal and the BBC reached a deal to make a new series, which they tried to sell as a six-hour mini, with a full series to follow if it got good ratings. However, by then only 60 PBS stations, with access to fewer than 20% of the population, still aired the series; so there was little interest except from CBS, but then came a change of management there and the deal fell through.

In July 1995 Amblin sold its part of the rights to Universal. It was soon after that the studio signed a deal for the much-watered-down "Dr. Who" TV movie with Fox.

By the time the TV movie aired in May 1996, only 50 PBS stations with access to about 15% of the population were showing the series. This, combined with the TV movie's very poor time slot and the very "Americanized" storyline, led to its near-to-last-place showing in the Nielsen ratings.

Now, in 2003, there are only 8 PBS stations, with access to little more than 8% of the population, still airing the series. This would make any attempt for a new "Dr. Who" series very difficult, especially with the proposed production costs of the BBC version (about \$4 million U.S. per episode). Even the pure "Americanized" version of the series will have a hard time getting around the advertisers, who could advertise on a reality series with thirty times the audience.

So, it would have been a different story if a series or a feature film went ahead in 1991, and we could be enjoying new "Dr. Who" episodes today.

Once again, there may or may not be a future for "The Doctor" and his Police Box, but as I said before, "Who knows?"

Film Review

– *Star Trek: Nemesis*

by Ryan Hawe

Perhaps we're a jaded lot these days. After all, the Trek franchise has had new episodes of some series or another since 1986. There are whole generations (so to speak) of fens who can't remember a time when Star Trek consisted of 79 cans of syndicated reruns, a half-forgotten animated series, and a handful of films; who have been expecting *Star Trek: The Next Thing* to come out on schedule.

Perhaps it's time for things to lie fallow, for this to be the last voyage for a while, for I could not shake the feeling that *Nemesis*, while by no means a bad film, and certainly an improvement over the indulgent mess that was *Insurrection*, was...an assembly-line movie. The spirit just isn't there anymore, and no amount of effects money, no directorial choice (they deliberately went for an action-movie director on this one), can hide this.

So, the set up: The Romulans finally get a full movie devoted to them – sort of. (I'm a bit glad for that, we've seen far too much of the Klingons.) Basically, one of their old forgotten schemes – a human named Shinzon – kills the entire Romulan Senate and takes over the Star Empire with the help of the Remans, a dark-dwelling subject race. It's later revealed that this Shinzon is –*gasp* a clone of Jean-Luc Picard.

Well, there isn't really too much else, plot wise. The *Enterprise* crew has to fend off an Attack of the Clone (har har) as Shinzon has become obsessed with making a name for himself and proving to the Galaxy that he's not just a copy of someone, he's a person in his own right. Daring escapes, pitched boarding-party battles, desperate ship-to-ship action, and awesome cinematography follow. And, in a move that could have been more bold if the last act hadn't cynically hobbled it, they provide a heroic exeunt for Data. If it feels like a reread of *The Wrath of Khan*, you might be right...

Of course, one may get the notion that I hated this film, and I want to stress that I didn't. There was a lot to like – the New 2002 Edition Romulan Warbird, some actual hard information on the Romulan home system (speculative Trekkers, take notes!), the amusing delivery of Brent Spiner

(playing a prototype android, named "B4", as well as Data), cameos by contributing actors (though most of Wil Wheaton's scenes ended up on the cutting room floor, I'm told), riveting space battles – all one needs is Kelsey Grammar's "Captain Frasier" doing a Gilbert and Sullivan duet with Spiner's Data, and a Baldwin brother as Mackenzie Calhoun, and you've got a fanboy's dream. Or so you'd think.

The problem is, there seems little that's genuinely new. We've seen Spiner play multiple androids over the course of the series, Riker and Troi's wedding could have been done in the last movie, we've had "in the bowels of the ship" fights in the classic series, *First Contact* and *Enterprise*, and the final "How will they get out of this?" dilemma – with the *Enterprise* crippled as a superweapon counts down – is lifted from *Wrath of Khan*.

Perhaps it's too much to expect a real "I can't believe they did this in *Star Trek*" sort of movie. They've been churning out stories for 16 years at Paramount, they know that a film will make at least X number of dollars, so they put the tested formulas on the assembly line, plug in some variables and Special Guest Villains, and there you are. While you can get a good movie out of that process, you probably won't get a memorable one.

And that's what I really wanted to see, for the Next Generation's final voyage, if such this truly be.

Final analysis? You'll like this film in the theatre, but you'll have a hard time remembering it the next morning. See it on a \$6 night, then you'll get your money's worth.



Creative Planetology

What I Call "Worldbuilding"

Garth Spencer

One of the first things a fan notices, in SF stories spanning most of the 20th century, is the wide variation in the imaginary worlds that writers create. Some are mock-medieval fantasy worlds, some are extremely plausible alien planets, and others are merely absurd.

As you might expect, my focus here is on how you work out human-habitable planets. I'm ignoring a *lot* of what passes for worldbuilding – be it in fantasy worlds, "subcreations" predating even Tolkien, or be it in roleplaying-game worlds.

So be warned: there are EQUATIONS and MATH in this article.

And now, a confession: this subject properly calls for calculus – which I did not succeed in learning. But close approximations of orbits, and other values, can be made by algebraic equations, which are offered here.

In a nutshell: Over the course of time, a certain amount of "prior art" in worldbuilding has accumulated, mostly in astrophysics. It appears that just a few quantities – such as the mass of a star, the mass of a planet, the distance between them, the angle and speed of a planet's rotation – determine almost every other physical feature of the surface environment. The mass (and age) of stars determines which types may harbour habitable planets, and at what distances; the orbital distance determines how long a year such a planet may have, and how bright the sunlight is on a planet's surface. The mass of a planet determines its surface gravity and escape velocity, how likely it is to have oceans and an atmosphere (and how much), and may be a major determinant in the length of its day. The presence of a gas giant seems to have a bearing on how frequently major meteors or asteroids may hit such a life-bearing world. The presence, mass and distance of a satellite, or satellites, determines not only the magnitude of tides, which almost certainly exceed the tides exerted by the sun; satellites will also help stabilize a planet's axis of rotation. "Rings" of dust, gravel or icy debris around a planet will probably have a climatic effect, cutting down insolation somewhat, and they are not likely to last long geologically, unless "shepherd" satellites are in orbit. Additional satellites might be found at the LaGrange points, also called Trojan points, in a planet-moon system, but are not likely to be found in the LaGrange points of a planet's orbit.

Fallacies to Watch Out For!

Some of the first few fallacies about astrophysics I noticed were the *Star Trek* references to planets as though they just *hung around* out there, without a light source or anything; or the references to planets around the well-known, major stars in our night sky – most of which are so massive and bright, they will burn out and/or become supernovas before any unlikely planets they have can develop life.

Numerous stories, from Blish's "Cities in Flight" series to *Star Trek* to *Star Wars*, made the mistake of giving a whole planet just one climate, or weather, all over.

A famous scene early in *Star Wars* shows *two* suns setting, almost at once, on a planet; a similar scene showed up in *Aliens*. Opinion is divided as to whether habitable planets can form in binary star systems, but a recent opinion in *New Scientist* (2001) claimed that they are possible, when the bright stars are as far apart as, say, our Sun is from Uranus. (Alpha and Beta Centauri form such a system.) But in such a case, the "secondary" star would just be another, very bright star; it would only appear in a planet's sky for about half the year. No double-sunsets there.

Double planets, however – a habitable planet with another, or even a gas giant, hanging in its sky – appear to be quite possible.

Habitability: Orbit, Rotation and Size

When Stephen Dole's *Habitable Planets for Man* was commissioned by the Rand Corporation in the early 1960s, the main criteria for a life-bearing planet were derived from one demonstration proof, the Earth we know. The observed physical criteria are that such a planet be sufficiently large to retain an atmosphere, be sufficiently warm at its distance from the sun to retain liquid water, be sufficiently small not to become a gas giant, and rotate in less than 48 hours, to maintain a tolerable range of daytime and nighttime temperatures. It is also important that the angle of inclination of a planet's axis of rotation to the plane of its orbit not be too acute, or seasonal variation will be absurdly extreme. Satellites cannot be too large or too close, or tidal forces will do more than make inshore fishing difficult; they will cause storms and floods too great for life, or eliminate the atmosphere, if not causing the mutual breakup of primary and satellite alike.

“C. H.O.P.K.I.N.S.’ *Ca.Fé*”

Since Stephen Dole's time, much work has been done bearing on the origins of life on the inanimate Earth. Lighter elements – gases and liquids particularly – would work their way up through the earth, and they continue to do so today, venting in places such as hot springs and natural-gas vents as well as volcanoes. Volcanoes emitted most of the gas and liquids which formed the atmosphere and oceans (up to 75% of the emission of volcanoes is water). Radiation, heat, cold and electric discharge in the primordial atmosphere all work to create amino and nucleic acids. Recent work indicates that not only in the primordial seas, but especially on shoreline clays, these products formed the basis of early life: self-replicating organic chemical bodies.

All this, if the above-mentioned elements are present – carbon, hydrogen, oxygen, potassium, iodine, nitrogen, sodium, calcium, iron ... you get the idea.

“Oh Be A Fine Girl Kiss Me”e: Stars as Primaries

The current model of planetary formation is that stars and planets form together, from vast rotating bodies of primordial gas and dust. The vast majority of material in the universe is hydrogen, or helium, which is what makes up and fuels every star in the universe. All other elements are produced by stellar nuclear fusion. When interstellar matter collects in a dust cloud, it slowly condenses, and heats up from gravitational compression. A sufficient mass of compressed hydrogen undergoes sustained fusion reactions. (And now you know how stars work.)

Observed stars have been typed in a regular progression, from the largest, brightest and most short-lived to the smallest, least radiant and longest-lived, according to types **O, B, A, F, G, K, M**. Unsurprisingly there is a relationship between a star's mass, and its energy output, and its lifespan, illustrated by the “Hertzsprung-Russell Diagram” (which you may immediately forget).

Over a certain size (rather larger than our own Sun), stars eventually exhaust their store of hydrogen, undergo all possible further fusion reactions and go nova, scattering heavier elements throughout space. The remnant objects form stellar objects in another progression (**R, S, N**), which includes black holes, pulsars and white dwarfs.

I told you all that in order to tell you this. For human habitability, or at least for life-bearing planets (and useful story settings), the range of candidate stellar types is limited to types F₂ through K₁. (Our own Sun is now typed G₂.) The reason is that, by definition, a life-bearing planet has to receive *enough* energy for liquid water to persist on the surface – and *continue* to receive that much energy for the several billions of years it takes for life to develop. This not only defines a “Circumstellar Habitable Zone”, or inner and outer limits

for potentially habitable orbits around any star; it means that too large a star burns out much too soon, and too small a star means that any planet receiving enough energy must orbit so closely that it will become “tidally locked”, with one face always toward its sun, as our Moon is tidally locked to the Earth.

That means most SF story settings will be on planets orbiting the following types of stars:

Table I: Candidate Stellar Types

Some Spectral Classes	Mass range (Solar masses)	Luminosity (Sun = 1)	CHZ (in AU's)
F0	1.5	4.8	--
F2	1.4	3.02	1.5 - 2.16
F5	1.3	2.3	1.24 - 1.78
G2	1.0	1.0	.776 - 1.12 (est.)
G5	0.91	0.7	.64 - .9
K0	0.74	0.3	.604 - .662
K1	0.73	0.252	.599 - .625

(From George Ochoa & Jeffrey Osier. *The Writer's Guide to Creating a Science Fiction Universe* [Cincinnati: Writer's Digest Books, 1993], p. 117, and my own notes.)

For absolute, rather than relative values, our Sun's mass is 1.99×10^{30} kilograms; our Sun's luminosity is 3.8×10^{23} kilowatts; and our mean distance from the Sun, or one “Astronomical Unit”, is 1.494985×10^{11} meters.

To calculate the total energy output of a star, compared to our Sun,

$$L_{\text{star}} = 2.52^{(4.85 - M)} \tag{1}$$

where

L = “luminosity”

M = mass (in Solar masses)

You may wish to note that the estimates of our Sun's CZT have kept changing over the last few decades. In a recent *Scientific American* article (Gonzalez et al., “Refuge for Life in a Hostile Universe”, Vol. 285 no. 4, Oct. 2001), the CZT was pictured as extending from just outside the orbit of Venus to outside the orbit of Jupiter.

Candidate stars in the local neighbourhood

Table II: Candidate Stars

Star	Distance from Earth (light-years)	Spectral Class
Alpha Centauri A	4.3	G4
Alpha Centauri B	4.3	K1
Epsilon Eridani	10.8	K2
Tau Ceti	12.2	G8
70 Ophiuchi A	17.3	K1
Eta Cassiopeiae A	18.0	F9
Sigma Draconis	18.2	G9
36 Ophiuchi A	18.2	K2
36 Ophiuchi B	18.2	K1
HR 7703 A	18.6	K2

Star	Distance from Earth (light-years)	Spectral Class
Delta Pavonis	19.2	G7

(From Ochoa & Osier [1993], p. 121.)

Remember, a light-year is the distance light travels in one of our years – and the speed of light (c) is 300,000 kilometers per second.

Galactic “geography”

It may be as well to supply a little more context here, about our Sun and its galactic environment. The majority of stars are in vast whirlpools, or galaxies, and are somewhere within the spiral arms of the whirlpool. Our own sun is in what is called the “Orion Arm” of the “Milky Way” Galaxy, and lies about 30,000 light years (roughly two-thirds of the distance) from the galactic centre.

It may concern you to refer back to that *Scientific American* article I mentioned. Gonzalez et al. (Oct. 2001) were concerned to establish whether there was a *Galactic Habitable Zone*. Apparently, if you go too far away from galactic centre, the “metallicity” or proportion of heavy elements in a system’s primordial dust cloud will simply be too low to form life-bearing planets; certainly, too close to galactic centre, the incidence of cosmic threats such as radiation is simply too great. The Galactic Habitable Zone they picture is rather a narrow band, and our Solar system appears to lie in the middle of it.

From magnitude and luminosity to insolation and ecospheres

The perspective on the CZT has changed in the last thirty-five years. As far as the inner limit is concerned: it appears now that the early Earth and the early Venus were extremely similar planets, but their distance from the Sun, and their consequent ambient temperature, made all the difference to their habitability. The early atmosphere of the Earth included a great deal of carbon dioxide; it was much more dense than it is today, like the contemporary atmosphere of Venus. On Earth, this atmosphere reacted with bodies of water to form carbonate minerals; plants also utilized carbon dioxide in photosynthesis, releasing oxygen in the process. These steps, depending on bodies of liquid water and the presence of life, could not take place on Venus.

To calculate the intensity of light a planet receives at a given orbit,

$$I = L/r^2 \tag{2}$$

where

- I = surface illumination
- L = “luminosity” (previously defined)
- r = semimajor axis

For some sense of proportion, it is helpful to know that at our distance from the Sun, the solar constant of radiation is 1.94 calories per square centimetre per minute (1.94 cal/cm²min).

**“Mother Very Thoughtfully Made A Jelly Sandwich Under No Protest”
Statistics from our solar system:**

A simple mnemonic (above) lists our Sun's planets, in increasing order of distance: Mercury, Venus, Earth and Mars (the "terrestrial" planets), the Asteroid belt, then Jupiter, Saturn, Uranus, Neptune (the "jovian" or gas giant planets), and Pluto. Opinion is divided as to whether a tenth planet lies all undiscovered beyond Pluto's orbit. (There is also a fringe theory that a planet with a highly elliptical orbit, and a period of perhaps a million years; but this is tied up with theories about ancient astronauts and our species being "seeded" here thousands or millions of years ago.)

The things to remember about the layout of the Solar System are how *vast* it is, in human terms – and that each successive orbit is *exponentially* more distant from the Sun.

As protostellar masses condense, they form immense rotating disks; the same slow gravitational condensation that eventually forms a star also forms rocky masses, planets-in-waiting, orbiting the centre. By the time that enduring masses in stable orbits have formed, their mass accumulation comes from meteorite infall. Apparently all orbiting bodies can be expected to orbit in the same direction, unless something really weird has happened. Also, apparently, all bodies rotate due to the repeated impacts of infalling matter, which may be why the gas giants rotate so rapidly compared to the terrestrial planets of the inner Solar system.

Today, if we view our Solar system from "celestial North", all the Solar planets appear to orbit counter-clockwise ("direct revolution"), and most planets also spin counter-clockwise about their axes. The exceptions are the planets Venus, Mars and Uranus, which for some reason spin the other way ("retrograde rotation"). Out of the first 32 known satellites, eight orbited their planets the wrong way ("retrograde revolution").

Two things seem pretty clear from the most elementary astronomy texts: the orbits of planets are precisely related to their masses and distances from the Sun; and yet their mass is pretty randomly distributed among the planets.

A fairly simple algebraic formula approximates the orbital periods – the lengths of year – of planetary bodies in a system orbiting about a central sun:

$$T^2 = 4\pi^2 r^2 / G(m_1 + m_2) \tag{3}$$

Where

T = the length of the year,

r = the mean distance of an orbiting body of mass m_2 from a greater body of mass m_1 ,

G = the gravitational constant (6.667×10^{-11} Newtons \times m^2/kg^2)

π = the ratio of a circle's radius to its diameter (3.1415926).

Real accuracy (describing the orbit as an ellipse rather than a circle) requires a formula in calculus, plus modifications for the perturbations of other bodies. Apparently all bodies orbiting can be expected to orbit in the same direction, unless something really weird has happened. Our own Earth is in the third orbit from our Sun.

The eccentricity, the difference of an ellipse from a perfect circle, is

$$(a^2 + b^2)/a = e^2 \tag{4}$$

where

a = the semimajor axis of the orbit (i.e., half the length of the ellipse)

b = the semiminor axis of the orbit (i.e., half the width of the ellipse)

e = the natural logarithmic base

Stephen H. Dole, in his early Rand Corporation study, estimated that orbital eccentricity could not exceed 0.2.

Mass, Planetary Fate, Gravity and Escape Velocity

Above a fairly large size planets can be expected to form immense atmospheres composed mainly of hydrogen and its compounds. These "gas giants" can be so large that their solid cores comprise an insignificant part of them. It seems to be the case that such planets will generally be in the outer planetary system, rather than among the inner planets, as the "primordial" atmosphere includes so many gases easily driven off by solar radiation: hydrogen, H₂O, methane, hydrogen sulfide, and ammonia.

If there is any rough rule, it is that "terrestrial" planets are liable to orbit closer to a sun, and "jovian" or "gas-giant" planets are liable to orbit much further away. But these are far from absolute rules.

When a sufficient mass of interstellar debris collects to form a planetoid, it forms a path, or space about its orbit, in which no other planet can form. This appears to explain why a rough algebraic rule, the "Titius-Bode Law", appeared to predict the distances of most planets in our solar system from the sun.

To simulate this rule, write out the successive powers of 2 - 0, then 2, then 4, then 8, etc. Then multiply each figure by 0.3. Then add 0.4 to each figure. The resulting figures nearly match the orbits of the planets, out to Uranus; the system breaks down at the orbits of Neptune and Pluto, and instead of a fourth planet as predicted, we find the asteroid belt between the orbits of Mars and Jupiter.

Current thinking, according to Stephen Gillett, is that the logarithmic spacing of stable planetary orbits is a tidal effect, which falls off as distance from the Sun increases; this seems to be supported by the fact that similar logarithmic spacing occurs in the orbits of the satellites of the gas giants. The reason why a planet did not form where we find the asteroid belt seems to be gravitational perturbation, principally by Jupiter.

That gravitational perturbation of Jupiter, by the way, is credited with sparing us a whole lot *more* meteorite infall than life on Earth can deal with.

Jupiter is an interesting case. Remember the distinction between the four inner, "terrestrial" planets, mostly consisting of rocky cores, and the outer "gas giant" planets, mostly consisting of extensive atmospheres? Gillett considers the distinction to be the "Ice Line", the orbital distance beyond which ice can form on a planet. Interestingly, Jupiter is both the innermost gas giant to the "Ice Line", and the biggest gas giant in our system. It is suggested that any system where life appears, depends on the appearance of such a gas giant.

Above a fairly small size, planetoids such as Ceres are forced into a spherical shape. As each growing planet becomes larger and denser, it develops enough heat at the core to melt the interior matter, perhaps the whole mass. Heavier elements work their way inwards and lighter elements settle upwards, towards the surface; thus Earth has a core mostly composed of iron, and a crust mostly composed of silicon.

To calculate the radius of a planet from its mass,

$$R = \sqrt[3]{\frac{3m}{4\pi d}} \quad (5)$$

where

R = the mean radius of a planet's surface from its centre

m = its mass

d = its density, approximated as 5.5 gm/cm³.

One Earth mass is 5.997 x 10²⁴ kg.

From this we can fairly easily calculate the surface gravity:

$$g = Gm_p/r^2 \tag{6}$$

where

G = gravitational constant
m_p = planetary mass
r = mean planetary radius
g = surface gravity

For comparison, Earth's radius is roughly 6.371 x 10⁶ meters; Earth's surface gravity is approximately 9.81 m/sec².

Alternatively:

$$dD = g \tag{7}$$

where

d = average density of the planet (relative to Earth)
D = 2R (relative to Earth)
g = surface gravity (relative to Earth)

About the smallest planet we can consider habitable would mass about 0.40 times as much as the Earth.

Length of Day

Stephen L. Gillett considers the planetary rate of rotation to be pretty random, as it seems to depend partly on the original infall rate and direction of meteors to a planet while it is in formation; and partly on how strong a tidal "braking" effect is applied by a major satellite.

I once worked out another, fairly simple formula where the rotation period varied inversely as the mass of a planet, *unless* it had at least one satellite representing a significant fraction of its mass (like Earth's Moon), or is quite close to its primary (like to the Earth relative to the Moon, or like Mercury and Venus relative to the Sun).

$$T = 2\pi R / K \sqrt{2M} \tag{8}$$

Where

M = the mass of a planet,
R = the radius of a planet,
K ≈ 2.3395716 x 10⁻¹⁰

Satellites

Many of Poul Anderson's stories are set on worlds rather like ours - but significantly smaller, and without any large, close satellite like our Moon. Larry Niven ("There Is a Tide") had an idea that a habitable world needed a Luna-type moon, to reduce the atmosphere by tidal effects, and to create intertidal zones where life might form. It now appears that an Earthlike world needs a large, close moon, but for other reasons: its

tidal effects stabilize our planet's rotation, otherwise we might find our rotational poles "migrating" all over the globe's surface, within only a span of *centuries*. That sort of makes it difficult for life forms to maintain stable ecosystems, much less to develop intelligence and civilization.

As it is, the fact that all the planets except Venus spin in the same direction is persuasive that their spin, like their mass accumulation, comes from their meteorite infall. Venus' slow, retrograde rotation is explained as a result of tidal forces exerted by the Sun.

There is a tide ...

The height of tides can be simply calculated as

$$m_l / r_m^3 = t \tag{9}$$

where

m = lunar mass

a = orbital distance

t = tidal effect (NOT tidal height!)

A more complicated formulation is

$$h \propto m_a r_b^4 / m_b r^3 \tag{10}$$

where

h is an index of tidal force,

a = a planet (major mass),

b = a satellite (minor mass),

r = common distance

The upshot is that if $h^2 = 2.0$, one side of the satellite ends up permanently facing the planet, as the Moon is tidally locked to the Earth.

LaGrange points

Gerard O'Neill popularized the idea of setting up permanent habitable satellites, not simply in Earth orbit, but in the "LaGrange points" preceding and following the Moon in its orbit. As a geometrical and mathematical exercise, some pogue named LaGrange came up with the argument that, equally distant from a major mass and a minor mass, and 60 degrees ahead and behind the minor mass in the same orbit, there should be points of gravitational stability, where a much smaller mass could remain in place. In point of fact there are "Trojan" asteroids oscillating around LaGrange points in Jupiter's orbit about the Sun. But due to various gravitational perturbations, any O'Neill space stations would have to be equipped with large enough positioning jets to return them to position when they are tugged out of place.

Rings - and global climate changes

Gillett discourses at some length on the effect that rings of dust, ice, or meteor-like debris would have on the climate of an Earthlike planet. The general effect is that they would occlude sunlight and reduce temperatures, especially in high latitudes in winter.

(I seem to recall a *Sky and Telescope* article, some years ago, speculating that there was volcanism on our Moon up to geologically recent times, which actually created such rings around the Earth and contributed to past Ice Ages. Any comments?)

Summary: Basic Variables, and Processes

Once you get on top of the math, it seems clear that many of the features of stars, planets, lengths of year and month, intensity of sunlight, magnitude of gravity and escape velocity, are all predetermined by a few initial factors; and many features are not predetermined.

What I have left entirely out of consideration – in this article – is what to decide about the plate tectonics and the lay of the land on a world; about the biochemistry, evolution, biology or ecology; or anything beyond astrophysics.

Now, how much astrophysics did I leave out? How many mistakes did you count? Come on, I'm waiting.

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