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J. Van
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Welcome to the third issue of *Xenophilia* (that's what the greek letters on the cover logo say), a *Heliopsis Press* publication edited and printed by RICHARD J. FAULDER, YANCO AGRICULTURAL RESEARCH CENTRE, YANCO, N.S.W. 2703, AUSTRALIA! The contents are copyright 1981, with all rights reverting to the contributors upon publication. Aside from editorial whim it is available for contributions of articles, artwork or letters of comment. Anyone sending magazines in trade should state whether they wish to receive future issues, otherwise they will receive a letter of comment in return.

The first contributor to this issue is PETER TOLUZZI, currently of 12 GEORGINA ST., NEWTOWN, N.S.W. 2042, AUSTRALIA. His article first saw publication in the Sydney-based Amateur Publishing Association, *Applesauce*, before being reprinted here. While, as the author points out in his caveat, the essay was not originally intended for fannish eyes, I thought it worthwhile for the overview it presents of the genre's perceptions of the evolutionary future of the human race (while noting that there is no real consideration of Olaf Stapledon's *Last and First Men*). The author is a science graduate.

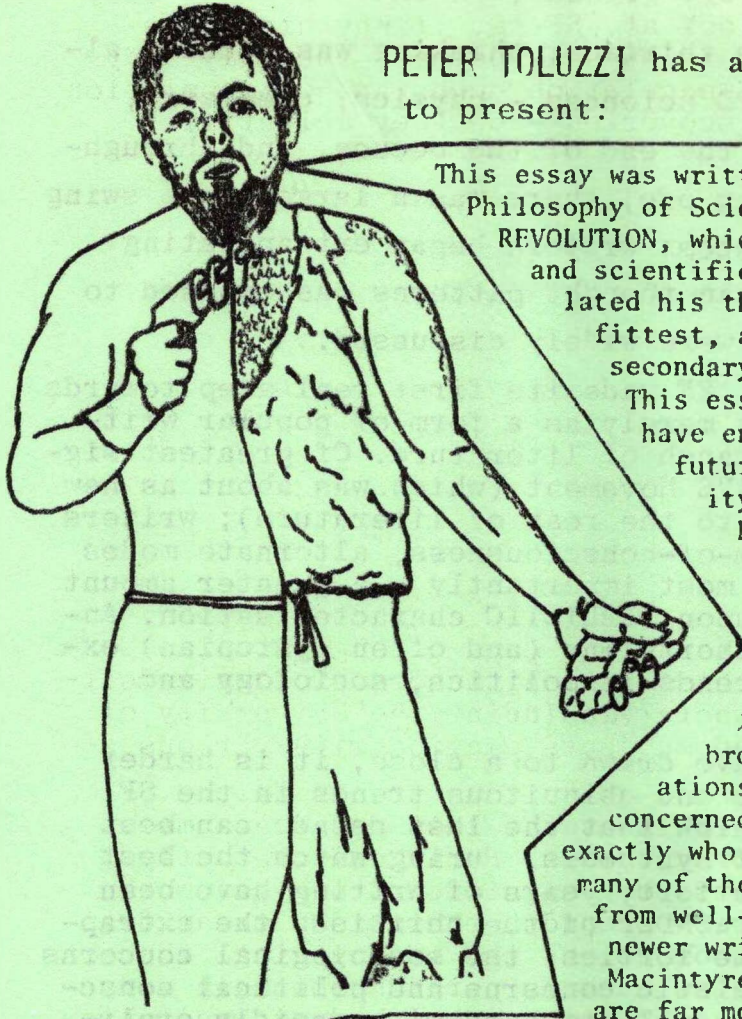
When I first considered publishing this journal, my original intent was to aim for a wholly serious publication. However, I have not been flooded with offers of serious articles on the subject, and in any event I realised that the reception for such a weighty tome might well be underwhelming. Thus, my deciding to introduce lighter material. Who better to provide such material than MARE BRTLIEB, who gave his address as the Kensington Institute for Biological Mythology, 1/2 WATER ST., KENSINGTON PARK, S.A. 5068 AUSTRALIA. A teacher, (poor sod, a fate from which I only recently escaped) with science training, he is known in fannish circles as a master of faanish writing and the publisher of the Q36 series of fanzines. For

this issue he writes on a subject very near to my heart (burn) - I'm a junkfood junkie from way back.

My third contributor is JULIE WAUX of 14 ZARA RD., WILLOUGHBY, N.S.W. 2068, AUSTRALIA. I approached her for an article after finding out she had a whole world (or two) tucked away inside her head. What came back was one of the nicer pieces of pure xenology (or is it xenography? I'm sure Terry Dowling will tell me) that I've seen. Since no one else, let alone me, could portray her Comorri with quite her command of line, I also commissioned her to do the cover illustration - in great haste, for which I thank her.

Speaking of illustrations brings me to thank my other artists. Firstly MARILYN PRIDE, my other commissioned artist, and MICHAEL MCGANN, two members of a community of artists living at that address. Last, but not least, JANE TAURMAN, of 2/2a Milner Cres., Wollstonecroft, N.S.W. 2065, AUSTRALIA and her Degasans (named after the Artist Degas).





PETER TOLUZZI has an explanatory introduction to present:

This essay was written for a course in History and Philosophy of Science, entitled THE DARWINIAN REVOLUTION, which was a study of the social and scientific climate in which Darwin formulated his theory of the survival of the fittest, as well as many primary and secondary implications of the theory. This essay discusses how SF writers have envisaged some of the possible future evolutionary paths of humanity. Both my lecturer and tutor have an interest and respect for SF, but neither had read extensively in the genre. As such, this essay contains a capsule history which will be useless to most readers of *Xenophilia*; it also contains many broad and perhaps false generalisations and statements - I was more concerned with making my point than with exactly who said exactly what. Similarly, many of the examples I have chosen come from well-established works rather than newer writers; in point of fact, Vonda Macintyre, James Tiptree and Ian Watson are far more relevant to my discussion

than Robert Heinlein or Clifford Simak. However, this is no apology; my conclusion (and personal belief) - that humanity's future lies in throwing off the shackles of "Nature" (Earthbound, ruled by instinct and ancestry, helpless prisoners of our genes) - in short, to become, as much as possible, the captains of our own lives and fates - is one I would be pleased to see feedback on.

WHITHER HUMANITY?

Although it has been in existence for much longer, science fiction first became a major body of writing during the Thirties. Each decade of writing since then has been characterised by a recurrent theme: during the thirties, one saw mainly the "Space Operas", which were usually little more than westerns set in space. The forties saw more hard-line extrapolation of ideas and trends; "What if" and "If this goes on..." were two frequent

questions; but, as in the thirties, thinking was usually along the lines of the HARD sciences - physics, chemistry, astronomy, etc. Towards the end of the decade, and throughout most of the following one, there was a large-scale swing towards the SOFTER sciences: writers began extrapolating sociological trends; Human thought patterns (as opposed to Alien thought patterns) were widely discussed.

During the sixties, SF made its first real step towards having significance, not merely as a form of popular writings but as a serious branch of literature. Of greatest significance was the NEW WAVE Movement (which was about as new as the horse-less buggy to the rest of literature); writers experimented with stream-of-consciousness, alternate modes of story-telling, and - most importantly - a greater amount of emphasis was placed upon REALISTIC characterisation. Another common theme was short-line (and often dystopian) extrapolation of recent trends in politics, sociology and economics.

As the seventies have drawn to a close, it is harder to pinpoint any specific and ubiquitous trends in the SF they have produced. I think that the last decade can best be viewed as a period of synthesis, during which the best elements of the previous forty years of writing have been collected: the SENSE OF WONDER of the thirties, the extrapolative techniques of the forties, the sociological concerns of the fifties, the stylistic concerns and political consciousness of the sixties - all combined with rapidly evolving technology - have made for some fascinating reading.

But more than that: this capsule history of SF is important, because SF has often been seen by the public as JUNK READING, pure escapism and nothing else. The successes of *Star Wars* and *Buck Rogers* have led many to forget the brilliantly prophetic and cautionary novels such as Aldous Huxley's *Brave New World* and George Orwell's *1984*. My point is that a great deal of SF - particularly that written during the mid-1950s and later - has much of significance to say. Nor am I alone in this opinion; hundreds of universities, in the US and elsewhere (including the University of N.S.W.) offer courses and subjects dealing with various aspects of SF.

Within the scope of this essay, this point assumes greater significance. For although SF may only recently have produced what amounts to a significant body of work worthy of study on literary grounds, there is a great deal more we can and should look at. SF is, if anything, the literature of ideas; and as such is perhaps the only body of work containing such speculation upon, and extrapolation of, recent trends and discoveries - be they scientific,

sociological, physiological or whatever. Thus, if we wish to ask WHETHER HUMANITY?, we have a goodly number of possible answers within the genre.

Darwin's theory of evolution and SURVIVAL OF THE FITTEST was concerned mainly with physiological evolution; many of the secondary implications of his theory were not considered until much later. Through Marx's LOCOMOTIVE OF HISTORY, and later Stalin and Lysenko, it later became clear that evolution had significance on many other levels. And this is a useful point, for I feel that we must look not only at the future physiological evolution of humanity, but more importantly at the intellectual and perhaps even cultural evolutions which are to come.

Each of these evolutionary paradigms - physiological, intellectual and cultural - has been explored by SF writers. And several trends emerge quite readily, all of which bear further study. To summarise:

- PHYSIOLOGICAL: Humanity has probably already approached the nadir of NATURAL selection. Of greater significance is ARTIFICIAL selection. Eg. through genetic engineering, etc.
- INTELLECTUAL: Towards a greater usage of our brain's natural abilities and powers.
- CULTURAL: Most following as a consequence of other changes.

Let us examine each of these areas in greater detail - According to classical Darwinism, physiological evolution consists of a series of random mutations, with those having greater survival potential reproducing and spreading. While this may be an excellent model for all of our history so far, there are several important considerations in today's world. Medical science has interfered wildly in Natural Selection: Haemophiliacs, diabetics and numerous other non-survival mutations are no longer dying off, but living to reproduce. Through increased technology, we have conquered most dangers presented to us by the environment; thus, increased physical strength, dexterity, or other improvements are no longer necessarily survival characteristics.

Both Lamark and Darwin agreed on one major point: the mechanisms of evolution determine that a species will be suited to its environment. However, in today's world much of our relationship to our environment is determined by technology, and surviving mutations are thus affected. For example, there appears to be an increasing number of babies who never grow wisdom teeth; these are obviously not important in today's societies of prepared foods.

If one allows these arguments, the obvious conclusion is that natural selection in terms of what we see as physiological improvements may be at an end. Medical technology will allow for increasing diversification of the race, as more mutations survive and breed, and our physiological

evolution - IMPROVEMENT - may cease.

Of course, there are many other factors to consider. Survival of the fittest has always held true, and probably always will; but in Earth's future, social and cultural parameters are more likely to determine fitness... This line of thought will be developed later.

One possible path of physiological evolution, as typified by the spreading absence of wisdom teeth, may best be regarded as DEVOLUTION. Paley and Malthus still have a lot of relevance, and there is presently nothing like a clear solution to the problem of over-population. These various scenarios have received some consideration in SF; T.J. Bass, John Brunner and Kate Wilhelm have all produced major novels on this theme, with Bass perhaps being typical.

In his novels *Half Past Human* and *The Godwhale*, Bass paints a horrifying yet subtly fascinating picture of an Earth, only a handful of centuries in the future but changed almost beyond recognition by population pressures. Humans are half their present size, with lifespans of barely twenty-five years - the lessened physical size requiring a much smaller food intake. They live underground, in warrens and tunnels; all the surface is required for use as arable land. The reduced nourishment has also led to a mental retrogression; the NEBBISHES as they are known, are barely intelligent, and function as components of the few (well-fed) controllers, much like the components of a HIVE-MIND.

Perhaps the only scenario for natural physiological evolutions here to continue is one where the physical environment again selects the fittest for survival. There are many such disaster stories in SF, whether they be the post-holocaust world of Walter Miller's *A Canticle for Liebowitz*, George Stewart's Earth decimated by plague *Earth Abides*, or the ecological disasters described by Kate Wilhelm in *Where Late the Sweet Birds Sang* or John Brunner in *The Sheep Look Up*. But it seems to me that within our planet's environment, controlled and adapted to with our technology, our physiques have approached the limits of natural selection and evolution.

I have been stressing the term NATURAL SELECTION thus far, and with reason. Science fiction has always been an optimistic genre, even with the recent cautionary tales. There is usually confidence expressed or implied in Humanity's ability to survive and adapt (although quite often it is only to discover that we occupy quite a low rung, on galactic and universal scales). And the pioneering work of Watson, Crick *et al* was tailor-made for those navigators of the future who sought acceptable mechanisms for their dreams and hopes. Genetic engineering and design, or even surgical adaptation, are considered the keys to our future evolution by many authors; and the possibilities (and examples thereof) are virtually limitless.

Consider:

Life on a mainly water world, or even within our own oceans. Humans, surgically altered to utilise gills and webbed feet and hands would be quite at home.

Life in perpetual freefall (eg. mining the asteroid belts, spacecraft crew, etc.) Thin and supple bodies with hands at the ends of their double-jointed legs and arms would serve best. Both of these fairly simple ideas are utilised in John Varley's *EIGHT WORLDS* future history.

Sockets implanted (at the base of the neck, for example), allowing us to interface directly with computers - perhaps the easiest merger of man and machine (from Varley, Samuel Delaney, and others).

Let's stretch the imagination. Humanity, the rulers, served by the Underpeople: animals converted into sub-humans through intelligence-enhancing drugs and genetic manipulation - from Cordwainer Smith's popular *UNDER-PEOPLE* stories.

Humans adapted to live on the surface (such as it is) of a Jovian gas giant. They would need to be short, squat and immensely powerful to cope with the high gravity and pressure; they must be capable of respiring methane and ammonia. And their perception and psychology might be vastly different from our own - as poignantly described by Clifford D. Simak in *Desertion*. Scholes and Rabkin (1977), both noted scholars and critics of SF, interpreted Simak: "Environmental determinism sees phenomena as the reflex of the environments that create them. In its best sense, environmental determinism is ecology that is finally concerned with one viewpoint only. When Science Fiction uses environmental determinism, it is a device to show how viewpoint, which we like to think of as a function of our minds and hence at least in part under conscious control, may actually be thrust upon us, viewpoint formed by the humbling forces beyond our control. ...The sense of ourselves which our Earth environment had determined becomes supplanted by a sense determined by the Jovian environment. And mankind, proceeding through time and space, continues, for all his freedom of will, to fall prey to environmental determinism"



These themes have obviously received much consideration in SF. However, even more treatment has been given to the idea of intellectual progress - basically, improving our brains (or even just learning how to utilise them more fully). And here it matters not whether this is natural or artificial evolution: the idea is that what separates humans from the animals is intelligence, environmental adaptation, technology - in short, our thinking ability. Obviously, then, the main direction of evolution for humanity, if it is to go on to bigger and greater things (whether this consists of ceasing to be planet-bound and conquering space, or perhaps to gain a clearer knowledge of ourselves and what has been termed inner space), it must learn to think better. As John Brunner (1975) put it, speaking through one of his protagonists (a leader of a "brain tank" in the not-too-distant-future): "There have been three races of Man: the legs race, the arms race and now the brain race."

There have been innumerable stories dealing with variations on this theme; discussion of a few should illustrate the point. Many have seen this process as the sudden appearance or consolidation, of what is virtually a new race of supermen: *Homo novis*, *Homo excelsior*, the paragons of whom we have had many examples throughout history - Socrates, Da Vinci, Newton, Edison, Einstein *et al*. Perhaps the single best example is Robert Heinlein's *Gulf*: at the time of a major species-survival crisis, *Homo novis* organise themselves and avert the threat. These New Men have thinking and reaction times several orders of magnitude greater than our own; they can communicate in a very shorthand language; and most importantly, they can think on several different levels at once. Imagine, if you will, four or five programmes running simultaneously (a large capacity computer makes a good model for the human brain); each of these programmes can use stored or new data; all are capable of what has been popularly termed LATERAL THINKING (ie. non-linear, or - with thanks to Thomas Kuhn - extra-paradigmatic thought processing). Such a being would obviously have far greater potential for survival than we ordinary beings, and Natural Selection again comes to the fore.

Though Heinlein is wildly exploratory, he is no idle dreamer; he bases his concept soundly in evolutionary and genetic terms. His protagonist, himself a suspected *Homo novis* and finding out about the concept and existing organisation, suspects random mutation. But:

"Huh? Who isn't a mutation, Joe? All of us are a collection of millions of mutations. Around the globe hundreds of mutations have taken place in our human germ plasm while we were sitting here. No, *Homo novis* didn't come about because great grandfather stood too close to a cyclotron; *Homo novis* was not even a separate breed until he became aware of himself, organised and decided to hang onto what his genes had han-

ded him." (Thank you, GALTON and EUGENICS!)

Another writer who has broken similar ground is A.E. van Vogt. In *The Pawns of Null-A* and *The World of Null-A*, THE PROTAGONIST is capable of fully utilising both sides of his brain, and is able to leave many limits of Aristotelean logic and functioning behind (NULL-A = NON-ARISTOTELEAN). And in *Resurrection*, van Vogt goes further to create a human of the future who can teleport, manipulate matter and energy on sub-atomic levels, and follow trails left by the passage of others through both space and time.

Not all of the genre's supermen are quite so awesome. While van Vogt touched on what we consider to be extra-sensory powers, Alfred Bester extrapolates considerably on these themes. *The Demolished Man* (1952) and *The Stars My Destination* (1955 - aka *Tiger! Tiger!*) are highly respected pioneering novels which for many years defined the treatment of especially E.S.P.. The former concerns telepathy, the latter teleportation; in both cases, Bester focusses closely on the societies which could develop from the widespread existence of these powers.

Frank Herbert is another author to consider. In his *DUNE* series of novels (the first is perhaps SF's most respected novel), a technological disaster many millenia past has created a taboo against powerful thinking machines. Instead, selected humans are trained from birth to become MENTATS - literally a human computer. Their main training is in the area of memory and information synthesis; they are capable of putting together many random and seemingly meaningless or insignificant data to arrive at their solutions and conclusions. In addition, a limited form of prescience is available, for navigating faster-than-light spaceships; a ten-thousand-year planned breeding scheme to produce a naturally (and reliably) prescient male comes to fruition during the novel... Again we see the influence of Eugenics.

Although we have only skimmed the surface of SF's studies of intellectual evolution, to go much further is beyond the scope of this essay. Of course, it is quite possible that humanity will go on for many centuries more, without obvious physiological or intellectual change other than the slow and gradual progress we have experienced thus far. However, as our environment changes, there will of necessity be considerable cultural evolution. Returning to the time-honoured theme of settling other planets, many writers have considered that our societies will change, discarding those habits and mores that are inappropriate to the new environment and adopting new ones in their place. And these may in turn lead to physiological changes - as mentioned earlier, cultural factors will often be the determinants in the survival of the fittest.

One common theme is that of the LOST colony world. Perhaps a colony ship strayed from its course and crashed, without means to contact or return to the mother planet; perhaps

a major crisis at home forced the neglect of some colonies. A prime example of this is John Varley's *A Choice of Enemies*, wherein the lost colony has the misfortune to be endangered by a recessive sex-linked gene causing widespread haemophilia in almost all males. After several thousand years, it has become a fully matriachal society, with the males considered precious and protected for breeding; the women have become physically the dominants and taken over all the traditional male roles.

Another example of cultural selection and determinism is to be found in Aldous Huxley's classic *Brave New World*. Here, genetic engineering is again the tool, but the governmental control dictates the directions the different parts of the human race will follow. But perhaps the most striking and thoughtful example is in Gordon R. Dickson's *CHILDE Cycle*. The Cycle, when completed, will consist of three novels set in our past (*circa* 14th Century), three in the present, and six set over the next five hundred years or so. Upon completion, Dickson will have traced the evolution of Medieval/Renaissance Man, through Modern Men, and onto a very plausible scenario for the future. In this scenario, with the advent of practical space travel much of humanity abandons the Earth to form the SPLINTER COLONIES. The HARD scientists - physicists, chemists, engineers, etc - colonise one planetary system; the EXOTICS, who combine psychology and ontogenetics (a form of prediction based on genetic and environmental studies) with many Yogic meditative powers of internal control, occupy a second; the Warriors, religious fanatics, and economic wizards all go their separate ways. Each of these splinter groups change their physiological and intellectual aspects through the simple fact of a specialised gene pool. Dickson has promised that in the final novels we shall see the eventual re-unification of the splinter groups and a resulting quantum leap forwards for Humanity. It should make fascinating reading...

One branch of environmental determinism which has been particularly influential in the shaping of SF was mentioned earlier; economic or Marxian determinism. Scholes and Rabkin again summarise:

"Karl Marx (1818-83) attempted to put historical development on a basis of mechanistic science. He argued forcefully that one could specify the dynamics of social interactions and thus predict their future outcomes; the LOCOMOTIVE OF HISTORY could be charted now because one could see how the rails must be laid. His own famous conclusion, of course, was that the working class would revolt eventually leaving a classless society in which all capital is owned by the state. These arguments had striking impact on science fiction. Just as other writers have used technological extrapolation to create their own worlds, Edward Bellamy in *Looking Backward* (1888) used Marx's

locomotive of history to predict a classless society. His world derives from a series of government takeovers of industry in response to the chaos brought about by unbridled unionism, but his historical reasoning employs Marx's assumptions, and the resulting society is Marxist in flavour. Wells's extrapolation in *The Time Machine* (1895) are based on a large part of Marxist notions of determinism, although Wells saw the capitalist class as sufficiently strong to literally submerge the working class. The final refinement of Marx's view of scientifically deterministic history is presented in Isaac Asimov's *Foundation* series (1951-53). The guiding genius in this era-spanning work is Hari Seldon, a mathematician who develops PSYCHOHISTORY, a science of history based not on Newtonian (and hence Marxist) mechanistic determinism, but on probabilistic, statistical laws somewhat like those incorporated by quantum mechanics. {Psychohistory also bears a strong resemblance to Dickson's ontogenetics... A good idea is worth using fully, and Dickson, like so many other SF writers, owes much to the pioneering work of Asimov, and Marx's ideas before him - Peter Toluzzi} Refining Marxist determinism by the insights of post-Newtonian science, Asimov is able to create a tale of the interaction of great masses of people, and simultaneously he can humanise the action of his tale by focussing on the importance of individual observers (experimenters, actors) who participate in the process of history they observe. Thus, science fiction, beginning with Marxist determinism as a base, has evolved a notion of history which serves as well as most fictional notions of physics or biology as the grounds for logical scientific extrapolation."

Thus far, I have been exploring some of the different directions Humanity's evolution may follow. This has been, of necessity, a very unstructured essay; the great variety of themes and possibilities, combined with frequent lack of depth of treatment of the relevant topics have ensured this. However, one interesting and significant theme seems to me to have emerged.

Throughout the 19th Century, there was widespread disagreement about whether Lamarkian or Darwinian Evolution was the more correct model; though this discussion continues still today, with neo-Lamarkism re-appearing every so often, there is fairly widespread agreement that as an overall viewpoint Darwin was the more correct. Our increased knowledge and understanding of genetic mechanisms defeats Lamark's beliefs about which acquired characteristics can be inherited; our present knowledge of causality cannot allow for the rather direct environmental influences that Lamark postul-

ated.

On this latter point, Lamarck has been frequently misinterpreted; his theory can best be presented in terms of the penetration of environmental necessities into the genetic make-up, with changes in the environment or a change of habitat leading through this mechanism to evolution.

However, virtually all the evolutionary paths described in this essay seem closer to the Lamarckian model. Physiological evolution through eugenics (essentially planned breeding) surgical alteration, or genetic manipulation all allow for a very direct environmental determination of evolutionary directions; we will literally be tailored to suit our environment exactly, with little or no random chance. These, and most forms of intellectual evolution, are such that through further alterations or merely the tool of communication we can pass virtually *all* of our acquired characteristics on to our offspring. And with cultural evolution, we are of necessity responding directly and consciously to changing needs - Darwin's essential randomness of survival-oriented mutations will be no more. Perhaps this is the ultimate form of environmental determination (which I consider to be the most significant distinguishing factor of intelligence): the ability to manipulate ourselves to suit our environment. However, there is a note of caution here: we should be wary lest we lose our cultural and historical heritage with the dispersal and diversification of the race. Culture, art, civilisation and ultimately life itself have always been dependent on strife and change; one of the most sobering of the cautionary tales I have read recently is John Varley's *The Ophiuchi Hotline*. Among the several alien intelligences described in the novel is one which, like our own in the story, has been forcibly evacuated from its home planet by members of a race of a higher level of intelligence. This race has been sending such advanced scientific knowledge and information via radio transmissions (hence the "Hotline"), and have been largely responsible for humanity being able to survive and adapt in the hostile environments provided by the other planets of our solar system. Now, they have come to collect the "bill": they want our culture. It seems they too lost their home world countless eons past, and have existed ever since thru' this mechanism of assisting other races who are in a similar position, and then taking the innate differences and unique essences of the rescued race into themselves - cultural vampires, as it were. It is a plausible, and none too pleasant concept...

Now, for some instant feedback, here are the mailing comments on the essay:

JACK HERMAN of 1/67 Fletcher St., Bondi, N.S.W. 2026 AUSTRALIA read your essay with reasonably close attention. I assume that you do not want a grammatical dissection, but would prefer reactions to the contents. Therefore, I will

turn to what you say.

I think you are wrong in your interpretation of the size of the splintering evident in the CHILDE cycle. Certainly the three major types, warrior, fanatic and philosopher are represented but most of the other colonies are not really that splintered; neither Newton nor Coby are as uniform as you suggest. Similarly, the three novels of the past section of the cycle deal with Hawkwood, Milton and Browning, thereby covering the 14th to 19th centuries. They represent, of course, warrior, fanatic and philosopher, respectively. (Gordy insists on using Faith Holder as an alternative to fanatic.)

JOHN NEWMAN of 163 Hutton St., Thornbury, Victoria 3071 AUSTRALIA always thought Darwin's idea was one of those basically tautological view points. If the human psyche and culture is seen as part of the environment each individual grows in, "the mechanisms of evolution determine that a species will be suited to its environment". No sweat. If a geneticist produces a change in the gene heritage of some human, then the real evolutionary adaptation by homo-sap was made when the geneticist evolved, not just when that person did their thing.



Talking about human evolution led me to review a story by Paddy Chayefsky (published by Hutchinson in 1978) about human devolution. Most people are more familiar with it as a film, but reading the book at least has the advantage that it doesn't tend to rupture the eardrums.

"ALTERED STATES"

The interesting thing is that Chayefsky opens with acknowledgements to "Anthropologists, endocrinologists, the entire tissue-typing lab of the Harvard Medical School and members of the School's psychophysiology department", to the "Director of Research of the Division of Parapsychology and Psychophysics at the Maimonides Medical Center Department of Psychiatry". He also acknowledges other workers "for the grounding they gave me in physical anthropology and paleontology". Most interesting is the fact that the same people who introduced him to "molecular biology", "theoretical physics" and "the extraordinary beauty and philosophy of quantum mechanics" also read the manuscript.

All of which is very strange. The essence of good science fiction is that, aside from it being good *fiction*, it should take known science and extrapolate or interpolate from that. Chayefsky, unfortunately, commits errors of scientific fact and logic in his pursuit of a story.

Not being a biochemist, I can't make a definite statement on the possibility, but it seems to me unlikely that there could exist a synergistic combination of biochemicals which would selectively bind to the DNA of the brain's limbic system. Yet this is the claim Chayefsky makes for the cocktail of chemicals derived from the Hunchi Indian combination



of psychoactive plant extracts. Even assuming the selective synergistic binding to DNA, it seems unlikely that this would occur in only one area of the body, and within the brain.

This matter aside, one can accept the idea of Jessup's reversion to the protohuman and, later, beyond, but not Chayefsky's explanation. A neutral explanation would explain the regression in terms of post-cognitively (as opposed to precognitively) determining the ancestral structure, which is then imposed on the body by psychokinesis. Not respectable science, but not demonstrably false, either. Chayefsky, however, would have us believe that Jessup's transformation and re-constitution resulted when "something....triggered some very old genes to work". He believes that "we've got Trillions of dormant genes in us, our whole evolutionary past". This last is itself ridiculous. Most of the genetic information of our ancestors has been lost, if not through fragmentation of the DNA strands, then certainly through mutation of ancestral genes, which is why we are different from our remote ancestors. Were it true, more recent forms would have more DNA than older forms, which happens not to be the case.

In any event, this is irrelevant, for the transformation would not be caused by the triggering of very old genes. If this were to happen, the result would probably be death due to the clash of old and new biochemistries. However, in order to achieve a transformation, there have to be genes which initiate and direct such a change. There is no way in which a whole panoply of genes which would regress an adult *Homo sapiens sapiens* into its ancestor of a million years ago could have evolved and/or been acquired by mutation and recombination.

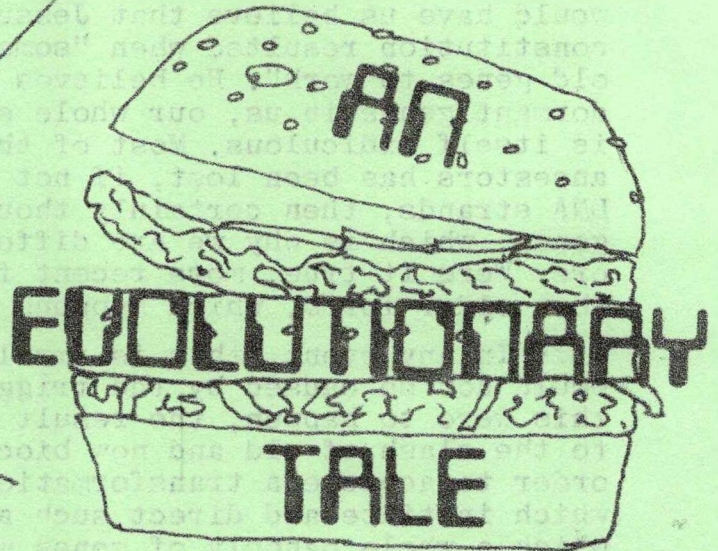
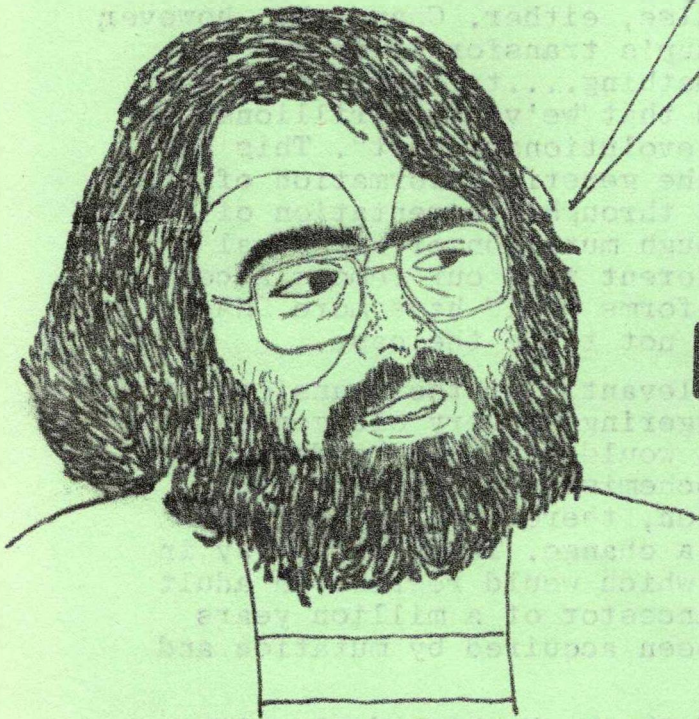
Fortunately the section of the book which deals with Jessup's ramble as the protohuman lacks the sense of low comedy with which it was imbued in the film. In fact, Chayefsky manages to give the reader a good sense of the protohuman's vision of itself as a stranger in a strange land.

For some inexplicable reason, in the two subsequent transformations of Jessu (and on the second occasion, Emily as well) beyond the protohuman state, Chayefsky refers to the transformee(s) as being composed of "antimatter". On each occasion, however, "antimatter" is clasped by normal matter. Need I say more? Further, on the first occasion, when the isolation tank is blown up, Chayefsky has Rosenberg suggest that the energy to do this comes from "a sort of human radioactive decay" which "is always accompanied by a loss of quantum energy". One would assume that to make the transformation back to human would require the re-acquisition of such energy, yet there is no account of this happening.

Unfortunately the strange things Chayefsky does with science tend to obscure the other messages in the story. This examines the world of academic science and the people in it.

From a story that tries to treat evolution seriously, and fails, we move on to **MARC ORTLIEB** who treats evolution light-heartedly:

This article is sort of biological. I wrote the first version while staying with Denny Lien & Joyce Scrivener, and was considering giving it to *This House*, but then realised that, considering its subject material, I really should give you first refusal.



In the days when myths were common, and when mythsters were much in demand, there lived a small and exceptionally undistinguished creature. Indeed, so obscure was it that it never did merit a name of its own. When folks wanted to speak of it, they'd call it "The thingamajig that looks kind of like a small cowpat" or "the whatsit that smells rather like wild onions", and this rather concerned it. (there was, of course, only one, as is often the case in mythological times. This is fortunate for mythsters who can thus tell the unabridged tales of these times without fear of the censor.)

In those days, God was a lot more accessible than He is today. His fame had not forced him into seclusion, and so the little creature had no difficulty in arranging an appointment with Him. It happened, however, that about this time God had reached the nineteenth century A.D. in His future

history, and was starting to become concerned about the evolutionary significance of His creations. Thus, when the little whatjercallit which felt like freshly sandpapered wet leathereasked that it could be re-created in a slightly more memorable form, God had to think for a while.

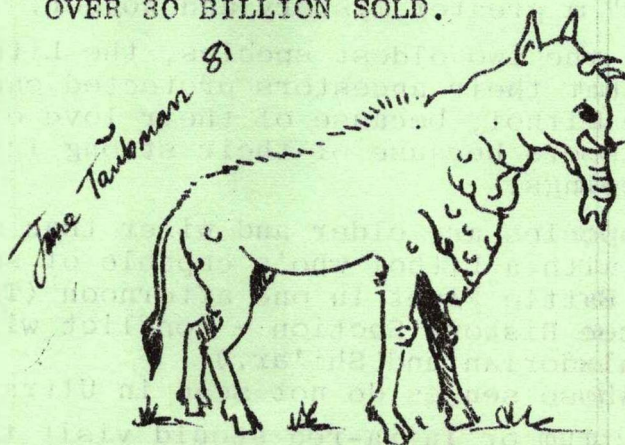
Finally He looked down and said "Very well. I can understand your request". (As a matter of fact, there was very little that He didn't understand at this point in history, Free Will not having had much time to make things difficult for Him.) "However, there are formalities to be observed. Certainly you want to be memorable, but we must keep this consistent with evolutionary theory. We can't go upsetting poor Darwin with a creature that doesn't fit. He'll have enough trouble with My representatives on Earth as it is. Tell, you what, I'll give you three wishes, one each for Me, My Ghost, and that good-for-nothing long-haired-git of a Son of Mine. I must insist, though, that you make the requests consistent with the theory of evolution." So saying, He filled the little widgett's mind with evolutionary theory as Darwin was destined to invent it.

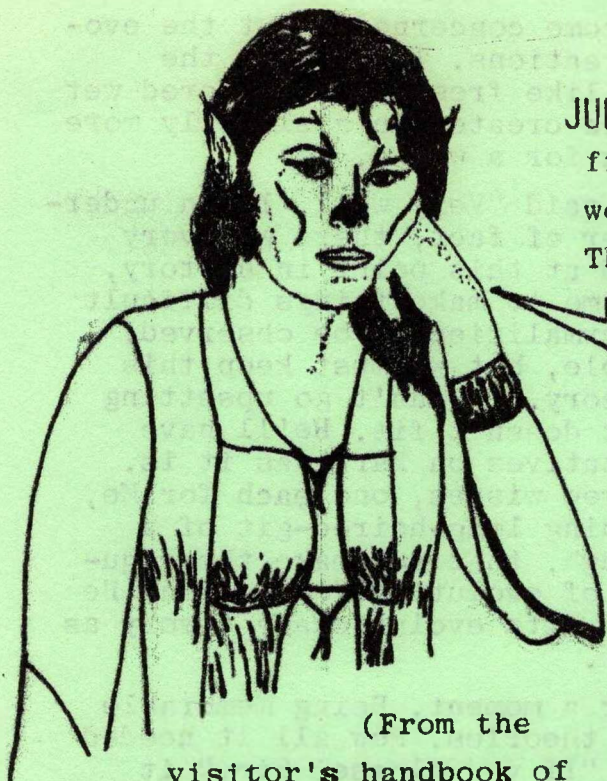
The whosiwatsis thought for a moment. Being memorable shouldn't go against any of the theories. Now all it needed was the rest. Finally it spoke. "If you please, Sir," it said, "I'd like to be a memorable creature with an extremely high rate of reproduction, and yet be so hideous that no other creature could possibly think of eating me."

God pondered the problem, doing so in the nanoseconds expected of deities and the more sophisticated computers, and then spoke. "In accordance with My will and the laws of nature, it shall be done." and sure enough it was.

However, God's craftily designed laws of evolution soon ensured that the little howsyerfather did not wreck His carefully designed ecology, There arose a beast that could, in times of direst hardship, consider eating the little beast, provided that the little bogamavillie was carefully shielded from the gaze by a screen of concealing foliage first. The little beast gained its memoribility, though. Indeed, just the other day I passed a sign that said, in big letters

OVER 30 BILLION SOLD.





JULIE VAUX speaks about her translation from the Interworld Graphsystem of the work of the third maternal cousin to THE Shanzadar:

This is my second draft, cut down from 15 pages of notes and I hope you find it both enjoyable and readable.

AN OUTLINE OF SELF-AWARE LIFE-FORMS

(From the visitor's handbook of Comor) by Loran Shanzadar

(Loran's standard "Waffle for VIPs so that I can get back to the Research Centre" speech.)

Comor, as a world, is noted, amidst the starways of this Galaxy, for the harmony found between its numerous biped, self-aware beings.

It has often been claimed that the reason for this is the wide extent of esper/psionic abilities amidst our population and the positive conditioning in their favour due to the World Media System.

Why Comor is so gifted is a matter of great debate amongst our scholars.

Comparing Comor to the planets Altamira IV, Sol III and Elfame makes our "magic" a greater mystery and wonder.

Scholars of the two oldest species, the Lithoi and the Feathered Dancers, claim that their ancestors protected each mutant variant as it arose, The Lithoi, because of their love of diversity, and the Feathered Dancers because of their strong instinct to heal and protect lesser beings.

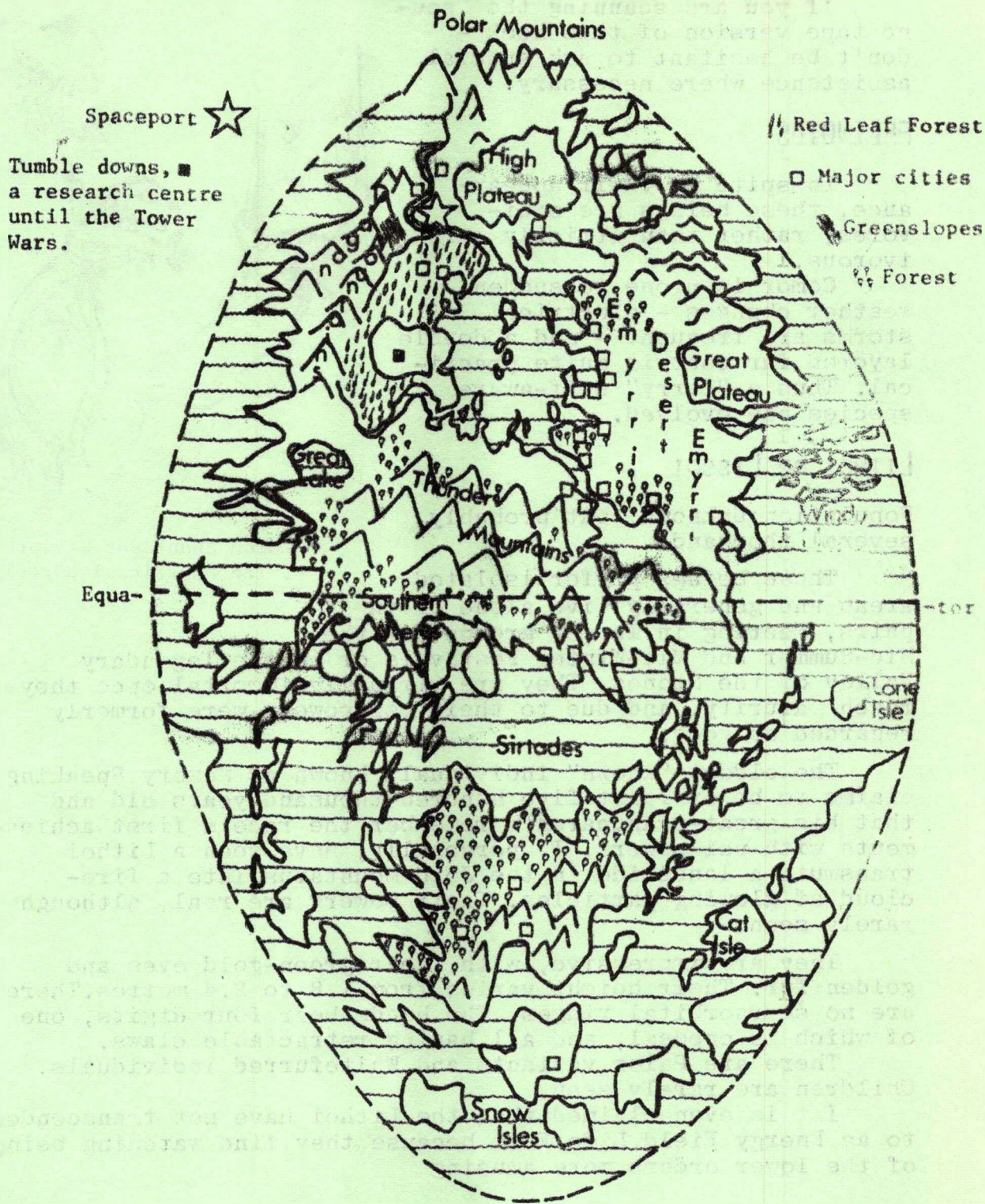
These two species are older and wiser than ours, and I'm not going to debate with a Lithoi who's capable of smashing half the Imperial Skrull Battle Fleet in one afternoon (Translator's note: An "in-joke" - see History Section - conflict with galactic empires Kree, Skrull, Galadorian and Shi'ar.)

(Visitors whose senses do not scan in Ultra-vision, Rainbow/White light spectrum or Infra-red should visit the Gallery of Life

MAP OF COMOR

Drawn in Comorri Style

Outline only - Geologic fault lines not shown.



Forms and observe the excellent analog holograms there, rather than struggling with the illustrations.

If you are scanning the sound tape version of this book - don't be hesitant to ask special assistance where necessary.

FELINOIDS

In spite of their appearance, these beings are omnivores, rather than strictly carnivorous.

Comor is prone to sudden weather changes - electrical storms are frequent - and a double layered fur coat is quite practical. Thus a "furry" self-aware species has evolved.

LITHOI OR LISSOI

Population: Unknown, but probably several thousand.

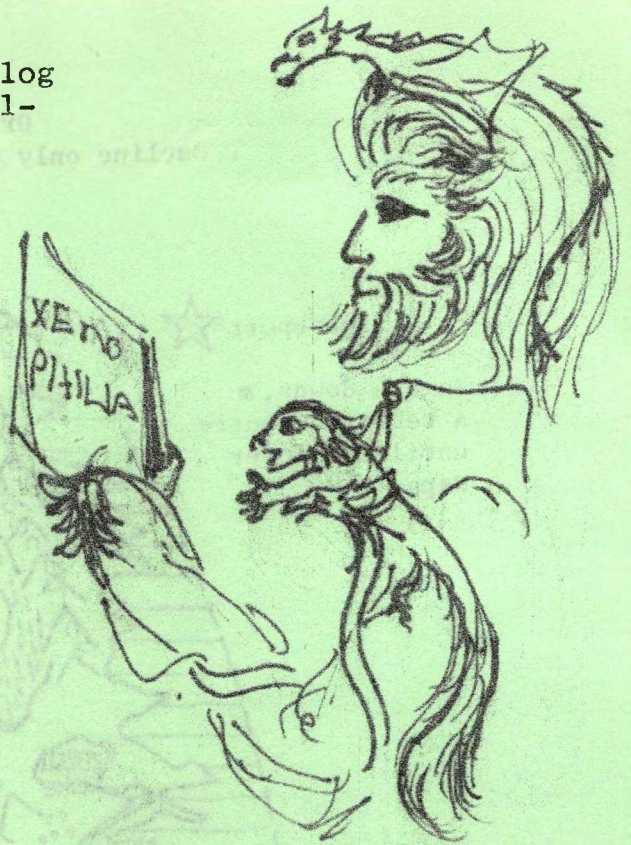
These beings prefer isolated areas and generally live alone or in pairs, meeting in larger groups for the Mid-Summer and Mid-Winter Festivals or in the legendary Valley of the Stones. They are virtually immortal once they reach maturity, and due to their psi-powers were formerly regarded as gods.

The oldest "known" individual, known as Memory Speaking, claims to be at least five hundred thousand years old and that his great-grandparents remember the race's first achievements with psi-powers. I, personally, have seen a Lithoi transmute a landslide in the Jord Mountains into a fire-cloud of glowing particles. Their powers are real, although rarely seen.

They are impressive, with their green-gold eyes and golden fur. Their height varies from 1.8 to 2.4 metres. There are no supraorbital ridges. The hands bear four digits, one of which is opposal, and all having retractable claws.

There are Paler variants and Whitefurred individuals. Children are rarely seen.

It is even claimed that the Lithoi have not transcended to an Energy Field Life Form because they find watching beings of the lower orders more amusing



Loren Shanzadar at work
(an unofficial portrait)



Male



Female



THE FOREST PEOPLE, THE CHILDREN OF THE TREES, OR THE DENLINGS

Population: 15-20 million (Exact figures are not available - the census is rare on Comor.)

This race prefers forests. Their idea of a perfect village site is a densely wooded hill with caves underneath. They will often construct their own "caves". In temperate regions the slopes and hills of the Green Slopes and Red Leaf Forest areas, where such caves are found, providing winter shelter and summer shade, are preferred for village sites. They are also found in marsh, river and sea-edge (tidal marsh) habitats where the Tamarill tree grows. (A Tamarill tree looks like a cross between a Moreton Bay Fig and a Mangrove with a touch of Paobab.) Rainforests also are home to them.

They live for 70-90 years and are noted for their empathic and scanning talents. Their abilities in both the psychokinetic and farsending areas are limited.

Their height varies from 1.5 to 1.8 metres, the males generally taller. Except for their mane, which is straight, wavy or curling, their minimal body hair is downy over pale brown, ochre or often golden skin. The hair itself, except in albinos, ranges in colour from black through brown, dark red and gold to blonde, or may even be "tiger" coloured. Red-brown hair is quite practical on a world where trees may have brown, red or purple leaves as well as green ones. As can be seen from the illustration, the mane runs down to the end of the prehensile tail, which is available to assist the five-fingered hands (there are four toes). The eyes (again, except for the albinos, where they may be blue, grey or purple) are coloured blue, green or gold.

A matriachal clan forms the basis of their social system. For more details about this see *Weber Woman's Revenge* 11(3) - R.J.F.

They are semi-nocturnal, being most active in the morning, evening and moonlit nights.

THE MOSS OR MARSH PEOPLE, THE GREEN GHOSTS, OR THE CHILDREN OF THE DEEP WOODS.

Population: 3-5 million.

The Moss People and the Forest Folk both mutated from the same ancestor - a nearly extinct being called the Black Mane

Originating in the jungles and rainforests of the southern continent this folk spread to its riverlands and sea edge, upwards along the western arc of the Sirlades to the Meres south of the Thunder Mountains. They live for over a century and are noted for their talent of



The nearly extinct
BLACK MANE

FOREST PEOPLE



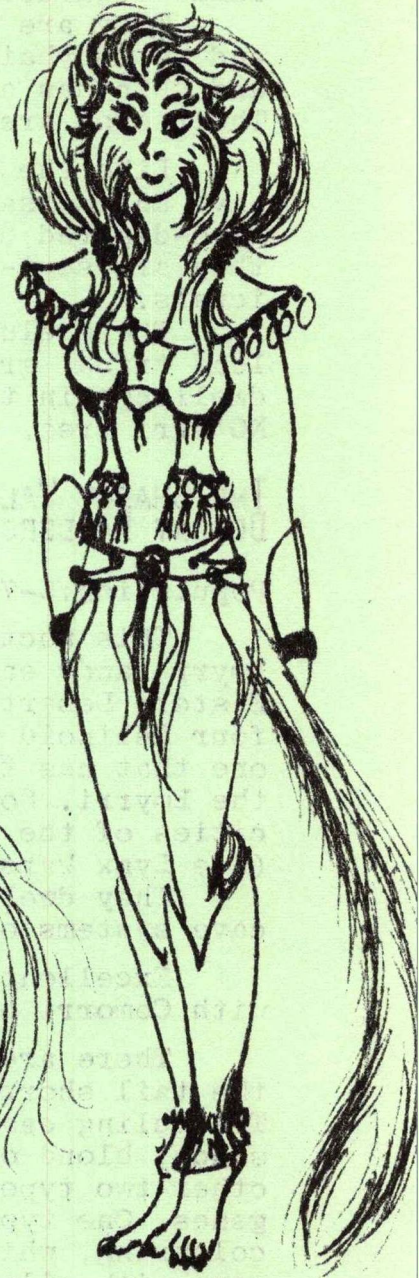
Tiger-coloured
female



Male



Child



Young female.
Note arm guards
for archery.



Hair pattern
from head to



Female and male of Red Leaf tribe:
"Where are my new arrow-heads?"



teleportation and also for their psychokinetic and far-scanning abilities.

The homoid Darkling tribes of the Meres and Southlands regarded them as spirits or demons in former times.

They are brown-skinned with a dark mane and tail and no bodyhair. Due to their environment and diet their hair and skin has a greenish overtone and a soft glow in dim light. Their eyes are yellow-green.

Like the Lithoi and Forest Folk their four-digitated feet have an opposal "thumb", and with the latter they share a five-digitated hand with an opposal thumb. However, because they are semi-aquatic the digits may be webbed in some individuals.

These elusive swimmers and sailors prefer, like the Redleaf tribal group of the Forest Folk, to construct their dwellings in trees, especially the greenish, moss-coated NG'arri tree.

THE SHADOW WALKERS, THE NIGHT RIDERS, THE LYNX PEOPLE, THE DESERT RAIDERS OR THE CAVE LURKERS

Population: 5-7 million

This nocturnal species is found on the prairies of the Emyrr lands east of the inland sea, throughout the Great Eastern Desert and plateau. Notice that the habitats of the four Felinoid races rarely overlap. This species is the only one that has frequent interracial aggression - mainly with the Emyrri. Some tribal groups have migrated to the port cities of the Southern Reach and the Sirlades island group. (See Lynx Wars - Emyrr History.)

They dwell underground during the day, either in natural cave systems or tunnels of their own making.

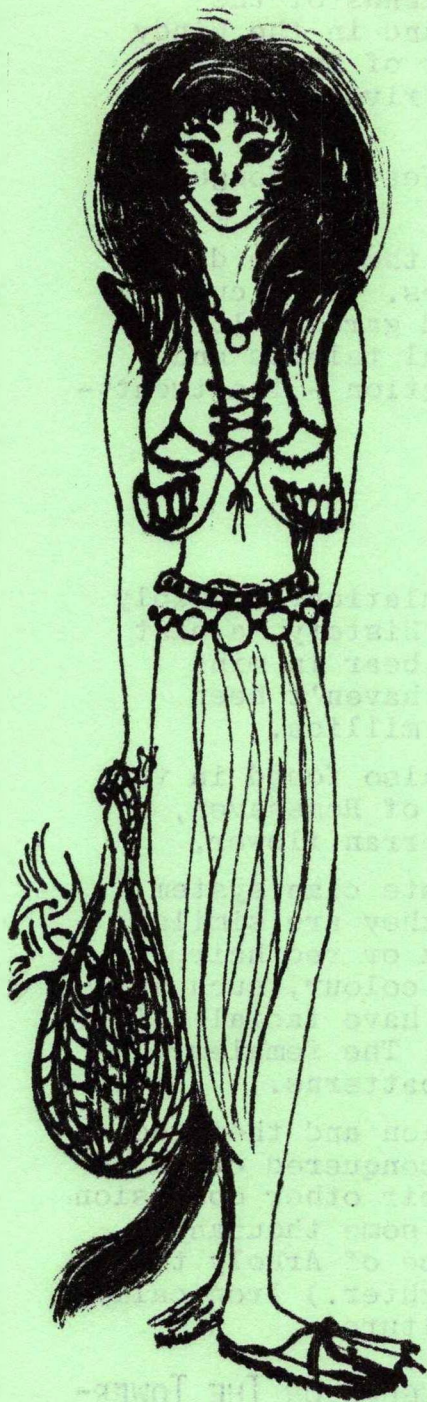
Excellent telepaths, they form symbiotic relationships with Comorri Lynx.

There are three types. In all the eyes are golden and the tail short or absent, so that some can pass as homoid. The ruling caste is 1.5-1.8 metres tall with a pale mane, sandy, blond or gold colouring and tufted mobile ears. In the other two types tufted ears indicate the presence of mutant genes. One type, 1.2-1.5 metres tall, has blonde or silver colouring, while the other, 0.9-1.5 metres tall, has a dark mane with silver fringes.

HOMOIDS

The Felinoids refer to them as the Changing Ones, the Tailless Ones, the Sunwalkers, the Grassweavers and other less polite terms. If you contrast the habitats of Homoids and Felinoids you will see why there's minimal contact. There is one theory that Homoids and Felinoids share a common ancestor.

MOSS PEOPLE



Fisherwoman



Male



Child

THE DARKLINGS OR THE OLD PEOPLE

Population:20 million

This folk is found all along the coastlands of the Inland Sea, south in the Thunder Mountains and in the Windy Isles, in the Sirlades and the southern part of Emyrr. They prefer to build their villages and towns in river valleys, grasslands and, where possible, on islands.

They are noted for their abilities as Weather Mongers and Rain Singers.

Ranging from 1.2-1.7 metres in height, they have dark, wavy hair, brown skins and green or dark eyes. Their culture is based on seasonal villages with scattered garden plots and herding. They are noted for their musical talents and the shaping of instruments. (See Musical Section - The twenty-string lapboard.

THE EMYRRI

Population:30 million

Why do the Emyrri have the largest population? Possibly because of the uneven effect of The Ancient History, a past war that lowered all the populations. Also, bear in mind that mixed populations and areas of overlap haven't been included. The total population is about 100 million.

In addition to Emyrr itself, they are also found in the Northern Moors and the Latelands north-east of Rosehaven, a port city famous for its cultivation of a Terran flower.

Noted for their aristocratic feudal caste clan system, which is patriachal and warrior-dominated, they are similar to the Darklings, but taller. They have dark or red hair, often streaked or flared with a contrasting colour, such as black with red or red with gold. Only males have facial hair, growing long beards which are often plaited. The females often weave their long hair into elaborate patterns.

The Emyrri are noted for their aggression and their conflicts with the Felinoids. They have often conquered other peoples merely to gain status as rulers. Their other obsession is "Horses" - a Terran work animal imported some thousands of years ago. (See Culture section - the race of Arkoly the Jo'vod lad and the High Lord of Askar's daughter.) Ironically, the peace-keeping Jo'vod arose from this culture.

THE NORLANDERS, THE STAR-RIDERS, THE IRONSINGERS OR THE TOWER-MAKERS

Population:10 million

Originating in the valley of the Great North River these people spread out over the Northlands due to their superior technology.

LYNX PEOPLE



Female

Golden race



Male



Middling race



Little race

They dominate the north and west coasts of the great inland sea, and the city of Fair Isle is a monument to a past empire, founded by their folk

Their height is that of the Emyrri, but their skin is paler. They have reddish, gold or blonde hair with forelocks often paler in colour. Males have beards. Their eyes are blue or grey.

They built Crystal Heart, Starbridge and Star Crown, as well as Fair Isle, and were the first to reach the stars. Their metal technology is noteworthy, as are their gene-engineering skills and strong psychokinetic abilities.

THE SHADALLI OR THE ISLAND FOLK

Population: 12 million

They live in the Sirlades and southern coastlands and the river lands north of the Thunder Mountains. Their height is about 1.5 metres and their hair is gold through to blonde, wavy or curling, with brown skin and green, brown or blue eyes. A maritime culture, they are farmers, fisherfolk and sailors. Peaceful and strong, merchants rule them in an oligarchy.

THE HOUSE OF DARKHORN, THE LORDS OF FIRE OR THE SHADOW ONES

Population: 2 million

They live amidst the Thunder Mountains and live for a century. Their psionic abilities include that difficult skill pyrokinesis.

Their appearance is impressive. Height 1.8-2.1 metres, they have dark, straight hair with white forelocks and streaks and blue or purple eyes.

They were formerly a caste of ruling priest-magicians in the southlands and were greatly feared and greatly loved.

THE SILVERLOCKS, THE MOON-WALKERS, STAR-EYES, SNOW PEOPLE OR SKY-WALKERS

Population: 3 million

They live on the High Plateau and high in the mountains surrounding it. Their lifespan is up to two centuries and they have the strongest psionic abilities on Comor after the Lithoi themselves.

Their height is 1.7 to 2.1 metres, hair pale silver-blond or white, skin pale ivory-brown, eyes blue, purple or grey and body slender. Albinism is common. Servants from peoples other than themselves are usually albinos, pale-coloured or mutants rejected by their own folk.

Interbreeding with other peoples is rare. They are magicians, priests, philosophers, historians and scientists.

HOMOID RACES



Man'

EMYRRI

Woman



Masked ARRAX
man



Woman

SHADALLI



Man



Young girl of a
DARKLING
tribe.

Polymath geniuses are common.

THE ARROX, THE SKY MASTERS OR THE MOUNTAIN LORDS

Population: About a million.

Their homes are in the high valleys of the north-west mountain chain. They are aloof and arrogant in their mastery of flight.

They have extremely strong psychokinetic abilities and like to ride their Mantas, King Hawks, Flutterwings and Altamira Sphinxes in ritual flights.

Their height is 1.5-1.8 metres, with prominent nose ridges and dark hair, eyes and skin. They wear masks as indication of rank.

NON-MAMMALS

THE DRAGONS, THE FLUTTERINGS, THE CLOUD SNAKES OR THE EARTH-SWIMMERS

Population: 1 million

They live along the west coast of the northern land mass and on some of the islands of the Sirlades.

After hatching they are aquatic and aware only on the empathic level. The second stage is sentient and biped and parents the hatchlings. This is followed by the adult, a homeothermic, egg-laying organism with scales, feathers and wings. Adults have telekinetic abilities giving them the ability to glide and control the weather and earthquakes.

THE FEATHERED DANCERS, THE FEATHERED SERPENTS, THE HEALERS OR THE LATELANDS

These beings live in the great marshes of the south, attaining an age of two, three or more centuries.

They are gentle empaths who specialise in the biological sciences. About 2 metres tall, they are homeothermic egglayers with pale skins and iridescent patterns of scales on their forearms, back, face and legs. Their "hair" is a mane of long white feathers and they have feathery antennae. Elders have feathers on their forearms and shoulders. Excellent swimmers with their webbed toes and third eyelids, they worship a living goddess.

On this planet the "hot-blooded" dinosaurs evolved feathers, and dinosaurs and mammals appeared at the same time. Thus, in the northern regions you have Feathered Serpents and Feather Crested Wyverns.

Certain Comorri "animals" appear to be self-aware and sentient as espers on an emotional level, and to have a sense of good and evil.

THE MURPHEL, a sea-living mammal with flippers and green-black fur.

THE GOLDEN WALKER, a giant carnivore, regarded as sacred by Felinoids.

THE KO'RA, a mimicing bird of limited vocabulary.

THE MANTA of the Arrox, possibly a mutated version of a Ta shataran animal.



Now that we've moved to considering the evolution of offworld organisms, we'll have a look at another offworld being. Because my field of expertise is in entomology, the study of insects (although my main current interests are in the taxonomy and biogeography of two groups of trapdoor spiders) I was asked to have a look at the next organism in terms of its feasibility.

Should any of my readers have a favorite et they want examined in this way, let me know where to find it in the literature. (Now, if only I could remember which one it was that Van Ikin suggested would be worth looking at.)



FEATHERED DANCER

in ritual cape

MAJAT

Source: *Serpent's Reach*

C.J. Cherryh

Physical Characteristics:

Majat occur in four castes - the very large, pale Queen and the Workers, Drones and Warriors, the last standing half again as tall as a human. All castes except the Queen are bipedal, walking with a stalking gait on their spurred, stiltlike lower limbs (the forelimbs have chelae) or running with eye-blurring speed.

On the head, capable of rotation and in Warriors armoured with chitin, are moiré-patterned compound eyes which see in the infra-red. Below these, and between the jaws, which in Warriors are massive and close with a scissoring action, are scent patches. Opening of the jaws exposes the spinelike false chelae which have a tasting function, and in Warriors also exposes the venom spike. At the sides are the jointed auditory palps.

The large size of these insectoid beings is made possible by the development of an internal skeleton and a respiratory system supplemented by muscular reservoirs, accompanied by the reduction of the external skeleton to a leathery integument studded with chitinous points. They are able to function quite well on a diet of sugar water.

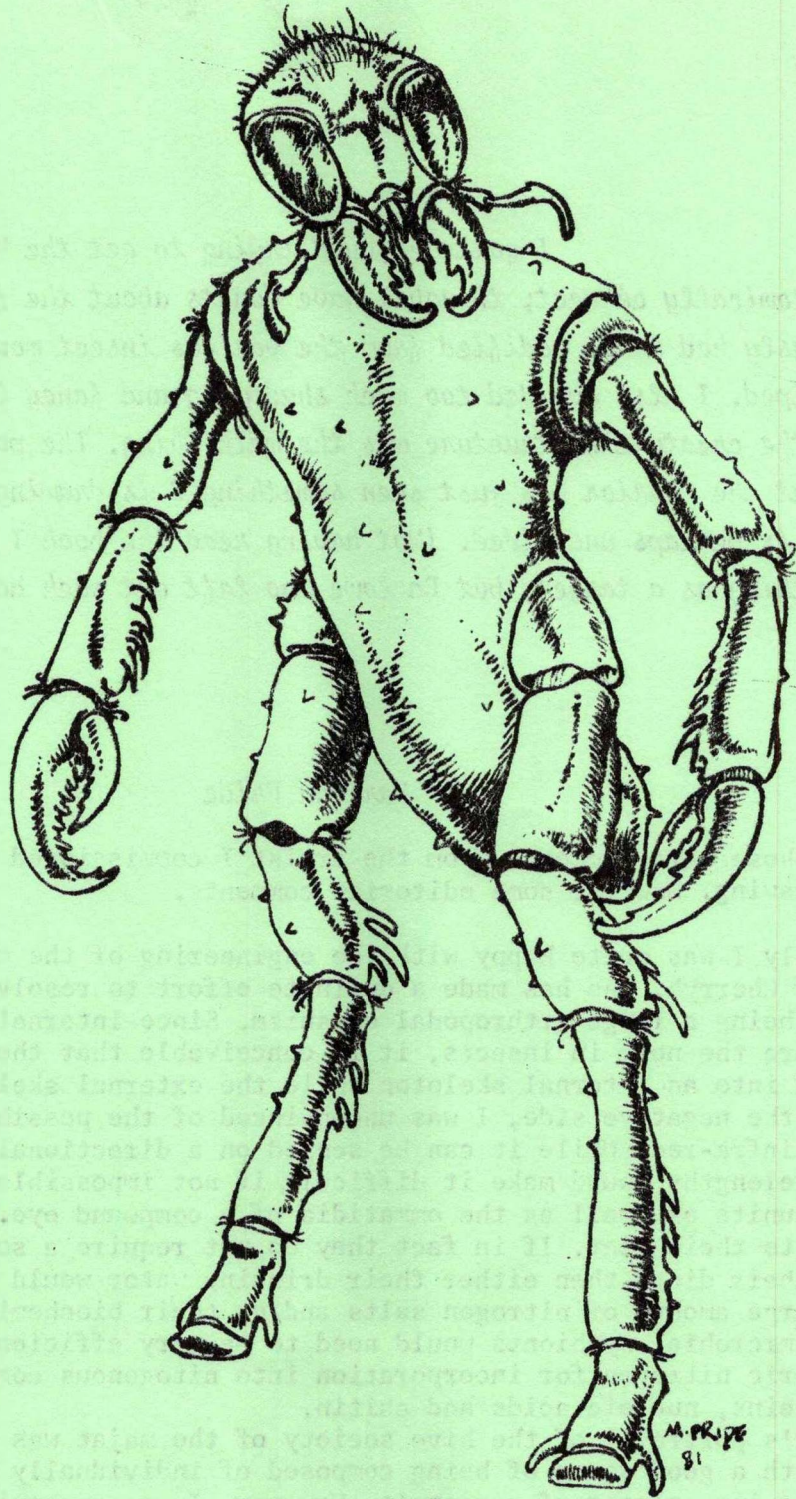
Habitat:

Majat live in mounds they construct in the soil of alpha Hydri III, where proximity to the primary makes unprotected human survival in the open nearly impossible.

Culture:

Each of the castes has a specific function within the hive-mind. The Queen, in addition to being the reproductive unit, is also the co-ordinator, passing on messages by scent, voice and taste. Intimate communication made possible by the last maintains the hive as a single mind. Through the Remembering function of the Drones the hive-mind maintains its continuity over the centuries, even though individual units live for only eighteen years, except for the longer-lived Queen.

There are four hives of majat - red, gold, blue and green, named for their infra-red 'colour'.



MAJAT WARRIOR

194 Corunna Road
Petersham N.S.W.
2049



Dear Richard

I quite enjoyed trying to get the Majat Warrior anatomically correct, though I have doubts about the feet, which obviously had to be modified from the various insect models to support a biped. I also avoided too much shadowing and fancy light effects as the creature's structure was the main thing. The posture suggests that the warrior has just seen something & is drawing back to strike, but is perhaps undecided. (Not having read the book I couldn't include anything as a target, but Barlowe too left out such additions.)

Marilyn

Marilyn Pride

Well, those were comments from the artist I commissioned to do the preceding drawing. Now for some editorial comments.

Generally I was quite happy with the engineering of the majat, as presented by Cherryh. She has made a definite effort to resolve the problems of being a large arthropodal organism. Since internal bracing structures are the norm in insects, it is conceivable that these could be developed into an internal skeleton while the external skeleton was reduced. On the negative side, I was unconvinced of the possibility of 'seeing' in infra-red. While it can be sensed on a directional basis, its long wavelengths would make it difficult, if not impossible, to be detected by units as small as the ommatidia of a compound eye. Likewise my reaction to their diet. If in fact they do not require a source of protein in their diet, then either their drinking water would need to contain a large amount of nitrogen salts and/or their biochemistry or that of any microbial symbionts would need to be very efficient at fixing atmospheric nitrogen for incorporation into nitrogenous compounds such as proteins, nucleic acids and chitin.

Cherryh's portrayal of the hive society of the majat was also quite pleasing, with a good sense of being composed of individually unimportant units functioning as part of a gestalt. However, I was unconvinced by the detailed messages which could be transmitted by taste, including not only emotions and incitements to action, but also the naming of objects. An organism's taste would be very much dependent on its physiological state, which would not remain constant enough over time for reliability.

NERVE IMPULSES

ERIC B. LINDSAY of 6 Hillcrest Ave., Faulconbridge, N.S.W. 2776, AUSTRALIA, offers thanks for the Greek zine. Not much I can say, since invented animals were never of much interest to me - only do wonder if you have seen a book with a title along the line *On the Track of Unknown Animals*? It may interest you.

I tend to think that one of the hardest parts of defining what property may be occurs when you try to define it in terms of land. Manufactured goods are relatively easy, but I still do not believe we have a workable attitude towards the property aspects of land. It is, if you are interested in attacking, a very weak point in libertarian attitudes towards freedom.

However, Judith was mentioning it for different purposes.

In a later letter he went on to wonder if George is correct in his speculations re how to devise alien biology, and why sf writers tend to get it wrong.

However, I feel obliged to take exception to a few very minor points. You will no doubt have noticed that, while most creatures tend to eat habitual, familiar foods, sophisticated societies tend to allow a far greater range of foodstuffs. One has only to inspect the range available at a David Jones store to agree with this (chocolate coated grasshoppers?). Therefore, it occurs to me that, possibly, if a creature is sophisticated enough to be space ranging, it may well be sophisticated enough to wish to add Gucci booted space heroines to its diet. And may even be artificially provided with suitable protections against the otherwise adverse effects of foreign protein, something in the manner of present day tourists carrying "wonder" drugs against the onset of Montezuma's revenge. Add an injunction from its travel agent to try the native customs and foods, the possible failure of mechanical translation devices, and one can imagine a reasonable ET trying said Gucci booted girl...after all, no truly civilised species would get around in such an outfit.

I must admit, your suggestion has the ring of truth. One can only hope that ETs will be a better class of tourists than the ones here on earth.

As to Jean Weber's speculations on biological research, it seems to me that one possible, and valuable, possibility is being overlooked. We are all aware of the processes involved in fermentation (especially when visiting conventions). Surely a suitable stomach inhabiting bacteria could be gene (sorry about that, Jean) modified to increase the output of certain fermentation products, with appropriate feedback from bloodstream levels of the by-product. Perhaps a more knowledgeable bioscience could even provide particular cultures with known effects and characteristics. The byproduct, of course, is alcohol, and the successful implantation of a suitable culture would eliminate altogether the need to drink at conventions.

Presumably one could have other cultures implanted to supply other psychoactive substances. The only problem would be how to turn off the little beasties on those rare occasions when one wanted to be sober. That aside, such a system would deprive one of the pleasure of having ~~acid~~ Inner Circle rum dissolve one's pharynx and oesophagus on the way to the stomach.

NEVILLE J. ANGOVE of P.O.Box 770, Canberra City, A.C.T. 2601, AUSTRALIA believes that the second Xenophilia is much better than the first. To which I can only respond that it wouldn't be hard. Naturally, I skipped your immortal words in order to pounce upon the promulgations of George Turner - Why is it that every time that man starts preaching, I begin to think of applications of Clarke's Law?

Several years ago I was unlucky enough to see a presentation by Sagan (a film at the Australian Academy of Sciences) dealing with the possibilities of extra-terrestrial life. Sagan claimed that because of the almost infinite possible biochemical permutations available, any such life found would most probably be incredibly strange (to us, that is). Now that really annoyed me. A few months later, a similar claim was published in Arena, and I finally got mad enough to stir myself into a LoC.

Now, although I only completed three years of an Honours degree in Zoology (I couldn't think of a thesis topic, so I completed the fourth year in Psychology instead), I included in those three years a reasonable amount of biochemistry, chemistry, genetics, and theoretical zoology. I still manage to keep informed in those areas (I hope), so have some small notion of what I speak. So...

Yes, all chemical permutations are possible, but some are infinitely more probable than others. Chemically speaking, given generally similar environments, the same families of chemical interactions will become ascendant due to simple probability - and we, if we ever leave this mud ball, will not be likely to visit any place whose environment is so different that such families would have bugged all interest in an environment different to such an extreme. Sagan's almost infinite biochemical permutations are reduced by a rather gross factor that leaves the most probable interactions as a very finite number.

But there is more (which you may have read about recently). Biochemically speaking, in spite of the tremendous range of environments available on this plane (if you think about it you'll notice that this range encompasses almost everything we will ever see - or did so encompass at one time or another) we only have two primary biochemical streams: man is a good representative of one, and the molluscs - the octopus especially, - represent the other. And these streams differ only in that the metallic component of the blood - the oxidiser - differs (and in spite of extreme differences in biochemical makeup and environment, both streams have managed to evolve rather similar mechanisms for using what we term "visible light"). In spite of the tremendous range of biochemical permutations available (assuming only the most probable are considered), why is it that so many of the essential components such as the genes, the energy transport compounds and many hormones use the same basic biochemical structures? It is because the alternatives are so damn inefficient unless the whole system is completely restructured into an improbable edifice! The final nail in Sagan's coffin (and George's too) is the finding that even a minority of genetic codes are far more likely to exist due to biochemical limitations than the majority: the most vital codes just happen to be the most probable ones as well.

The end result of this probability game is to produce life as we know it.

The argument that George presents about the limited environmental range on Earth causing a limited degree of diversity is a load of bull. The environmental range on Earth even now is extreme - temperatures from around 200 Kelvin (at the Poles in mid-winter during a blizzard) to several hundred degrees (the inside of an active volcano); air pressure from a few millibars to 1000; atmospheric compositions varying from the standard we breathe to ones high in sulphur (volcanic areas, remember); surface pressure from several pounds per square inch to several tonnes (the bottom of the deep ocean trenches). Add to this the fact that life evolved in conditions hostile to life as we now know it, and the environmental limitations begin to look a bit sick. About the only factor that hasn't varied has been surface gravity, and that will not affect biochemistry unless it is so different as to completely alter surface conditions. (I will admit that life as we know it is unlikely to have evolved on the surface of Jupiter - because of those environmental conditions, life in any form is bloody unlikely, although not impossible.)

About the only thing left is gross physical structure - and all I can say is that relative variation is unlikely to be greater than we have on earth anyway, and it would take extreme environmental conditions to give any one form ascendancy. (Mankind is so mediocre that his worst was always a bit better than his competitor's worst; mankind didn't win, the competition just lost instead.)

Basically, I am saying that our present knowledge justifies a belief that any life we are liable to meet - provided we don't sunbathe on the surface of gas giants or go sailplaning in the Venusian tropics - is most likely to be quite similar to life as we know it, simply because it is the most probable in those environments we will explore.

To cap off George's piece: centaurs are not impossible, really, just a bit improbable; the mouths and gullets of fire-breathing dragons could be coated with saliva (just like a human fire-eater); a full-grown Grizzly bear pushes the half-ton mark (and what about the carnivorous dinosaurs such as *T. rex*?); and why would a free-floating balloon ever develop intelligence?

Anyway, the rest of the issue was also enjoyable. I just wish people would get off this "anything is possible" kick about extra-terrestrial life.

Basically, I agree with the general thrust of your arguments. However, you can't use the similarity of terrestrial biochemistries to support your argument for the universality of certain biochemistries. To do so indicates a failure to use Occam's Razor. The most likely explanation for the observed similarities is that all terrestrial organisms share a common biochemical ancestor. Otherwise you are going to have to take the view that life on Earth is polyphyletic, and the similarities have been generated by massive evolutionary convergence. The polyphyleticists are causing enough trouble in the consideration of the higher taxonomy of the arthropods without their doing the same to the whole terrestrial biota.

GERALD SMITH of 8 Frawley St., Frankston, Victoria 3199, AUSTRALIA offered congratulations on the appearance of *Xenophilia*. Generally the production values are high with thoughtful layout and excellent reproduction.

The only dissapointing aspect of this issue was that there didn't seem to be enough of it. Being quarto size and only twenty pages doesn't seem to leave room for all that much, and just when you are really getting your teeth stuck into it the end arrives. I fully appreciate the cost element especially mailing costs but it still came somewhat as a diss-appointment.

George Turner's article raised no new issues as far as I am concerned. The idea of gargantuan creatures is one I long since realised was a biological absurdity. However, the article was, as is usual for George, very well written and succinctly and carefully examined the question in a manner that should, if widely enough read, dispel the notion for all time.

At this point I feel I should add a cautionary note. My exercise with the majat and Nev Angove's remarks on Grizzly bears and dinosaurs indicate, I hope that big beasties can't be written off out of hand. One just has to go about constructing them carefully. Of course, nothing can make the absurdities of the B-grade movies of the 1950s plausible, but one shouldn't write all such constructs off automatically.

Your review of *Beloved Son* largely coincides with my own opinions on the book. When I had finished reading it I had the strange feeling that somehow something was missing and I couldn't quite put my finger on it. Now that you point it out it does make sense, though, this idea that the book had too many concepts to try and deal with in its limited space. Still *Beloved Son* stands apart from the bunch and shows once again that Australian writers do not have to emulate overseas styles to write successfully. All they need to do is strive to write well in their own style.

There isn't much at all I can say about Jean Weber's review since I have not read the book in question. However, it does make me want to read it the first opportunity I get and this is one of the aims of a good review. (The opposite can, of course, also be its aim.)

In future issues of *Xenophilia* (and I do hope there will be future issues) it would be pleasing to see more of R.J. Faulder in other than just a review. Perhaps a good sized letter column would also add a little something. But, I suppose it again comes back to the cost factor.

Actually, the cost factor isn't all that important in my reckoning. (I've never said I was bright.) The main problem is getting people to write articles in a limited area. However, the last issue could have been thicker, since I had permission to use the Peter Toluzzi article. However, I didn't use it then because I couldn't tie it into the format for that issue. As luck would have it, the material for this has tied together very nicely on a thematic basis, which is the way I would like to do things. (As you've hopefully noticed, this is also a good bit thicker. Unfortunately I'm right out of material now, so the next issue is waiting on some more to arrive.