Human Ethology Bulletin

VOLUME 14, ISSUE 4 ISSN 0739-2036 DECEMBER 1999

OUR BODIES ARE IMPERFECT, FOR GOOD REASONS

Interview of Randolph Nesse

By Frans Roes
Lauriergracht 127-II
1016 RK Amsterdam
tel. (3120) 6259399
froes@dds.nl

Randolph Nesse is a physician and psychiatrist who used to be frustrated with psychiatry's lack of theoretical foundation. In 1985 at a meeting of a group that later developed into the 'Human Behavior and Evolution Society', he met and discovered share interests with George Williams. Their cooperation resulted in several publications, among them Why We Get Sick, The New Science of Darwinian Medicine (1995). The following interview took place in Tucson, June 7, 1997.

FR: There is a story in your book about mice that hate the smell of cats. What is it about?

RN: I think we use that story to illustrate the benefits of fever. The mice did not like the smell of cats, and therefore they got a drug so they were not bothered so much by that smell. They felt better in the short run, but then they died, because a cat obviously would eat them. We compare that to someone whose normal fever was blocked by doctors who block a defence without thinking about it.

FR: So although the mice were suffering from the smell of cats, this suffering is actually useful to them.

RN: Exactly. One of the main ideas I have pursued is that natural selection has shaped the capacities for emotions. Negative emotions are just as useful as the positive ones. So anxiety and boredom and jealousy and anger and low mood are all useful in their place. The temptation for doctors or psychologists is to assume that if someone feels bad, that there is something wrong with them. That either their brain is not working right, or their cognitions are not working right, or something like that. But in fact, if you take an evolutionary view, it is very likely that a whole lot of suffering is just normal mechanisms working, usually in situations that are not very favourable to us. Obviously, if you are experiencing pain, it is not a good situation, because your tissue is being damaged. You have got to get out of that situation. But the pain is not the problem, the problem is whatever is damaging your tissue. Likewise, if you are feeling anxious or low, probably bad things are going on in your life. You should try to stop them. And if you stop them just by blocking that emotion with a drug, that might not be the best thing. But I would like to stress that there shouldn't be any clinical recommendation that comes out of Darwinian medicine directly. Darwinian medicine should lead us to research-projects we never thought of before.

FR: You write that medical professionals have often been asking the kind of questions you are asking. What kind of questions are these, and why are your answers different from the ones they gave?

RN: If George Williams and I have contributed anything to this field, it is a very small change in perspective that has fairly large implications. Ever since Darwin people have talked about the evolution of disease. This is a mistake. Diseases don't evolve, but the body's vulnerabilities that lead to diseases, they are a product of natural selection. What we are encouraging people to do is to try to understand why the body is not better. Why can't natural selection make the body better? People used to say "Well, natural selection just isn't that good". That might not be the right answer. Some people imagine that George and I are saying that the body is perfect, because natural selection is such a strong force, but we are saying the exact opposite: The body is imperfect, -for good reasons. And that is not an idea that is very commonamong medical researchers yet.

FR: So why are there so many complaints about how our bodies function?

RN: We list several categories of explanations. One of them is that what seems to be a disease, is often a defence. So fever, cough, nausea, pain, vomiting, diarrhoea, anxiety, low mood - those are not problems, those are responses to problems. Fever decreases the ability of bacteria to reproduce. Even cold-blooded animals go to warmer places when they get a bacterial infection, in order to kill off those bacteria.

When people go to the doctor they usually complain about these defences. They complain of fever, nausea or pain, fatigue or vomiting, and about half of the medical practice is blocking those defences. The next question is: Well, if all these defences are so great for us, how can doctors get away with blocking them all the time? I think there are two answers. One is what George and I call the 'smoke detector principle'. That is, the defence is cheap, vomiting for instance only costs you a couple of hundred calories. Vomiting is really essential if you are about to die, or if you have any chance of dying from a toxin that is circulating in your system. So if there is any chance of a toxin in your stomach, you should vomit. Likewise for fever. If there is much of any chance that there is a bacteria in your

system that might be damaging it, it is in your best interest to increase your body-temperature.

FR: So often your body-temperature is raised while you could get healthy without raising it?

RN: That's right. We take aspirin and we usually get better anyway, just as fast, without having to go through a fever. The other reason why doctors usually get away with blocking defences is that the body has redundant mechanisms. There are other mechanisms that do the same thing, it is not just high fever that kills bacteria. So that is another reason why we can get away with blocking fever.
This has the biggest implications I think for new drugs that are being invented for regulating human emotions. Already we are getting pretty good at blocking low mood. And I ask myself the question: What is going to happen in the next ten to twenty years if we develop all kinds of new drugs to block low mood and anxiety safely without addiction? How should we use those drugs? We have been thinking about those emotions as abnormal, and I am trying to help people to see that these emotions as useful in certain circumstances. On the other hand, given what I just said about the smoke detector principle and the redundancy principle, it might well be that a high proportion of emotional suffering that people experience, is completely unnecessary.

FR: You write that survival is of no consequence in and of itself. Is the body not designed to survive?

RN: You get a very different view on medicine and disease once you start taking the evolutionary perspective. Survival is just one means by which genes make organisms that get more genes into the next generation.

So for instance you could ask the question: Why is it that males die sooner than females in many different species? The proximate answer, -that is the biochemical answer-, is that they have more testosterone. The evolutionary answer has to do with: Why is there more testosterone? The answer appears to be that for males, reproductive success varies a lot more than for females, and increased investment in competition early in life can have a big reproductive pay-off. Therefore men who do more competitive things, and devote fewer resources to for instance defending against infection, have a reproductive advantage over men who live longer.

Another quote: Some current medical research seems a bit like trying to understand a clock's malfunctioning by analysing all its gears, without daring to ask about their functions.

The distinction between proximate explanations and evolutionary explanations is very simple, very profound and very misunderstood. A proximate explanation is how something works, it is what the mechanisms are like, how the gears are connected, how the chemicals work, how development works from DNA to shaping the whole organism. An evolutionary explanation explains why the DNA has the exact sequence of amino-acids that it does, in turn, why the organism is the way it is. And that has to be framed in terms of how a certain trait gives a selective advantage. This all sounds very technical; it is much easier to do it with examples. The one I use a lot in lectures is: Why do polar bears have white furs? The proximate explanation is that the polar bears' body doesn't make pigment for the fur. The evolutionary explanation is that white polar bears catch more seals than brown ones.

FR: A major cause of disease is infection. The accepted view is that hosts and parasites will slowly evolve to some cooperative state. What is your comment?

RN: We are all taught this at school, and even many microbiologists until the last couple of years still imagined it to be like that. On the surface it doesn't make sense to say that the parasite or pathogen should kill its host, because how is it going to survive without the host? It would be better if they could live with their hosts and gradually evolve into a mutual harmony where they don't hurt each other too much, and both go along.

That turned out to be a very naive view. Paul Ewald and a number of other people showed that virulence, -that is how nasty a pathogen is-, is a trait that is shaped by natural selection. He showed that if an infection is

transmitted by something that doesn't require the person to be up and around, like a mosquito, a nurse's hands, or a syringe, then whichever pathogen makes the most copies of itself the fastest, is going to get passed on. So selection is going to make it worse, more virulent; because while making many copies of itself, the parasite will exhaust the host. But if the person has to be up and around to spread the infection, like with a cold or like with cholera once good sewage-treatment comes in, then those that kill off someone right away will be selected against, while those that are a little bit more mild will be selected for. If proper sewers come in, the more nasty form of cholera is quickly displaced by a milder form.

FR: Why was the cholera nasty in the first place?

RN: Because the greatest advantage to the cholera organism was to make as many copies of itself as possible. Even if the person that was lying in bed was unable to get out of bed, all of the diarrhoea and copies of the cholera-organism flowed into the common public water-supplies. As soon as you have proper sanitation, that road of transmission is gone, and you have to get that person up and out of bed, to transmit it.

FR: So the pathogen now needs its host to be healthy...

RN: And of course, we all talk this way, "the pathogen needs", and we all know when we talk that way, it is not that the pathogen needs anything, there is not any planning involved, it is just that those pathogens that do cause a bit milder illness transmit themselves better.

FR: You wrote about an arms-race going on between pathogen and host.

RN: Once you start realizing the layer and layer and layer of complexity that goes on between bacteria or viruses and the host that is trying to control them, it is just astounding. Each one of these nasty things has to get into our cells sometime. And so they usually imitate something useful to us, like a hormone. By imitating something that is naturally in our body, it gets hard for our body to attack the parasite, because then we are likely to attack ourselves.

Once the parasite gets into our cells, the body has certain ways of identifying that something is wrong, and the cell literally holds out a little flag to the rest of the immune-system saying: "Listen, I have been infected, kill me off". And then the rest of the immune-system comes in and kills off that cell, with everything that is in it. But of course the bacteria and viruses want to stop that from happening. So certain bacteria and viruses have the capacity to block that cell from signalling to the rest of the immune-system. But then the body has other ways to getting around that, to otherwise detect that the cell is infected. So layer and layer of deception, detection of deception, and again deception in an arms-race that escalates. The reason that George and I have used the term arms-race, is because just like in a race for intercontinental missiles or nuclear bombs, this one can absorb a whole lot of an organism's energy, to the point where it gets detrimental to the whole. For example, if you look at the amount of disease by auto-immune reactions, you realise those are mostly caused by arms-races with pathogens. Our system has to be set to be able to make anti-bodies to attack parasites, and sometimes it goes off when it shouldn't, and it makes anti-bodies when it shouldn't.

FR: You also give examples of how parasites can manipulate the behavior of hosts.

RN: The simplest ones actually are not in humans. There is a fluke that is so tiny that it can enter the brains of ants. The ants are crawling around on the sheep-meadow. The fluke enters the brain in such a way, that somehow it induces that ant to crawl up to the top of grass, and grab on so it cannot let go. And of course, those are the ants most quickly eaten by the sheep, and they are the next host in the life-cycle. There is something very similar in snails, they are infected by a different organism, and they crawl up on the beach and are the first to be eaten by seagulls.

Rabies is even more dramatic. Once it gets into the system of the host it gets into the nerves, and it arranges in a sophisticated mechanism for its own transport to the brain. Then it

becomes concentrated in several areas in the brain, in the areas that regulate aggression, swallowing, and the salivary glands. So you end up with a host organism that has lots of saliva full of rabies-virus, that can't swallow, so the saliva builds up in the mouth, and that becomes very aggressive and bites. All of which is to the advantage of the rabies-virus. Nobody planned it this way, it just works.

FR: Sneezing, is this a host being manipulated?

RN: Who knows what sneezing is? Is sneezing for our benefit, for the viruses benefit, or for both? It might be that the virus is manipulating us, to spread itself in a cloud of droplets. It might be that we are sneezing in order to clear up things from our nasal passages, and to prevent the infection from getting into us. Or it might be for both our benefits, and at the cost of everybody else that is around us.

FR: Many infectious diseases can now be treated with anti-biotics. What is an anti-biotic?

RN: An anti-biotic is some chemical that kills bacteria more readily than it kills us. Where they come from is more interesting. It is really neat to learn that they just don't come out of nowhere. These are chemicals that are made by bacteria and fungi, usually ones that live in the soil. Why do they make nice things for us? Is that some kind of divine force providing beneficent drugs for us in the natural environment? No, it is because those bacteria have been fighting each other for not just millions of years, but hundreds of millions of years, and almost any compound they can make that inhibits the growth of their competitors has been tried. In contact with some competitor they start making more of these compounds, and sure enough, some of the very best antibiotics that we have, are products that have been in the eco- system for years, made by fungi and made by bacteria to defend themselves against other living organisms. And we are just extracting those chemicals, purifying them, and using them in humans. We are borrowing these things that have been created by natural selection in bacteria over millions of years for our own use.

FR: You give quite some attention to toxins, and write: There is no such thing as a diet without toxins.

RN: At least there is no such thing as a perfect diet. I always thought before I came into this field that there was some diet that we were meant to eat that was perfectly healthy. But like every-thing else in the body, it is all a trade-off. You can eat vegetables constantly, but most of those vegetables have things in them that are designed to keep them from being eaten.

FR: But there are no toxins in meat usually. Why are there toxins in vegetables, and not in meat?

RN: Because vegetables cannot run away, so they use other means to defend themselves.

FR: You give some advice about what to eat when you are starving in an unknown wilderness.

RN: This is not a matter where I would really want to follow the advice directly from Darwinian medicine, some expert advice from the locals would be better. But just theoretically, if some animal is advertising itself to you because it is brightly coloured or readily available, it probably means that it is not very good to eat, because otherwise something would have eaten it. Why did natural selection favour it to have a bright colour? Because it warns other things to stay away. Deception may be going on here too: Things that pretend to be poisonous, while they are not. If on the other hand something is hard to get at, like it is inside a shell or the like, that is an indicator that it is good to eat, if you can get to it. But what you really should do in the unknown wilderness is ask someone else to taste first.

FR: How is it that unripe fruits, like some green apples, can give you a pain in the stomach?

RN: The proximate explanation is: because they have a bunch of bad chemicals in them. The evolutionary explanation is that apples that are eaten prematurely don't spread their seeds, while apples that have a way of gradually developing while they are safe from being eaten, are able to mature to the right moment, then suddenly turn the right colours, express all the sugars, and take away the toxin. Fruits are obviously designed to be eaten,

because those that are eaten spread the seeds of the plant. That is your first choice in the jungle: Find something that is a fruit that is designed to be eaten.

FR: You write about a mismatch between our design and the present environment. Out of this mismatch arise perhaps the most preven- table modern diseases. Can you give some examples?

RN: If you go and make rounds in modern hospitals, nearly half of the people who are there, are there because of diseases that are caused by the modern environment, that they would not have gotten if they lived in a more natural ancestral environment. What are these diseases? Well, first of all, the diseases caused by bad diets. Then there is the huge burden caused by substance abuse. The worst of which is cigarettes, then alcohol, with cocaine and all the other drugs causing just a minute amount of problems compared with alcohol and tobacco. Breast-cancer may well have to do with a change in reproductive patterns. It is much more commonnow then it used to be.

Once you have taken those diseases away, you have dealt with about half of the people in the hospitals. Does this mean that if we all lived in the African savanna without any medicine that we would be healthier? No, we would be much less healthy, we are not arguing that things were better off back then, we are only arguing that nowadays most diseases are the product of the mismatch between our environments and our bodies, which were designed for a very different situation.

FR: You also wrote that frustration may result from consistently overestimating ourselves. Why would we do this; overestimate ourselves?

RN: If you ask people in large cooperations, do you think you are paid what you are worth? Most will say: I am worth more than I am being paid. On the average people over-assess their own value to the organisation. So let's ask ourselves for a second: Wouldn't it be good for people to be objective about their usefulness for the group? Probably not. Probably people who are completely objective about themselves don't get the advantages that come to some other people who think that they are a little better than they are. Because if you can pull off convincing other people that you are more valuable than you really are, then you get all the advantages that comes from that status. In fact, if you look at social life, there are all kinds of social displays that are essentially deception, where people are trying to act like they're richer then they are, or sexier than they are, or smarter than they are, or something, in order to convince people. If you believe it yourself, that works pretty well.

FR: Some people are worried by the idea that because diseases are treated, the problem is just moved to the next generation.

RN: Ah, the eugenics-question. Often when I lecture somebody says: "Well, isn't medicine making the species less healthy?" That has been a question that has been raised, since the middle-ages at least. The people who raised it the most seriously were the Nazi's, who thought that doctors were making the stock worse by preserving the lives of some sick people. The whole eugenics movement took very seriously the possibility that you could improve, quote, the genetic stock.

First of all, according to my values, it is wrong to do that kind of thing, so-called for the benefit of the species instead of the individual. More than that, there is very poor scientific justification. From what we now know about gene-frequencies and their relationships to disease, the amount of impact you would have from even very strict reproductive controls on people with diabetes, heart-diseases, schizophrenia and other kinds of diseases, would be very small and only in many generations. Plus a lot of the so-called genetic diseases they were treating probably were not genetic diseases anyway. So one question is: Are you really sure about what you are dealing with? Who knows what inventions will be available for the next generation? There does not seem to be any likely benefit that would be worth interfering with peoples rights. So George and I have tried as strongly as we can, to say that our purpose is not to use evolution for the benefit of the species. Our purpose is to use natural selection theory in the tradition of mainstream medicine, for the benefit of the individual patient.

Salmanca Conference Update

Thanks to Sally and Paco Abati, organization is underway for the 15th biennial conference of the International Society of Human Ethology, which will be held at the Palacio Fonseca in Salamanca, Spain, August 9-13, 2000.

Salamanca is a beautiful city of about 180.000 habitants, located 200 kilomeers northeast of Madrid, on the river Tormes. Founded in pre-Roman times, it was named Salmantica during the Roman era and was an important point on the 'Silver Road'. It later became Visigothic, was occupied by the Arabs and reconquered by the Christians in 1805. Its famous University was founded around 1200. Plan now to secure airline tickets and take advantage of the this stimulating intellectual and cultural site.

Transport to Salamanca:

From Madrid the easiest way is to take a rapid bus (Bus Expres) which makes the trip in about 2 hours. The cost of a return ticket is (at this moment) about 4.200 pesetas. The bus runs every hour. You can also take a train from Madrid to Salamanca, but it takes longer (about 3 hours), they run only four times a day, and are a little cheaper than the express bus. You can also hire a car in the airport. But in Salamanca it is not necessary to use a car, everything is within walking distance.

Climate:

The climate is of the continental type. Normally in August it is quite hot, with temperatures at noon between 30 to 40 degrees Celsuis, cooling off at night.

Social program:

We will try to organize a visit through old Salamanca and a trip to the surroundings of Salamanca.

For more information contact:

Conference fax number: +34 923 361 569
Conference telephone number: +34 636 354 913
Conference e-mail: humet@gugu.usal.es

CALL FOR PAPERS AND SYMPOSIA FOR ISHE 2000

Symposia, individual papers and poster proposals that address any aspect of research within Human Ethology are welcome. 100 word abstracts for all papers and posters (including symposium papers) should follow the following format: Line 1: authors' names, last name first. Line 2: institutional address(es). Line 3: title of presentation in capital letters. In addition, proposals for symposia should include a 250-word description of the symposium theme together with individual abstracts of the set of related papers (usually 3 or 4 papers plus discussant).

All proposals should be submitted to our President-Elect, Linda Mealey. **Submission by e-mail is preferred,** but hard copies with IBM, or Windows disk with the name of the operating system and word processing program will also be accepted. Abstracts for all submissions have a deadline of 1 April 2000, but earlier submissions are urged. Send proposals to:

Linda Mealey
Psychology Department
College of St. Benedict
St. Joseph, MN 56374 USA
tel. 1-320-363-5481
fax 1-320-363-5582
e-mail: lmealey@csbsju.edu

Lodging:

Salamanca boasts a wide variety of hotels which cost up to 70 dollars per person/per day. For the meeting we have chosen 4 hotels and a University teacher residence, which is in the same building where the meetings will take place.

University teacher residence FONSECA:

Individual: 6.900 pesetas per night
Double: 5.700 pesetas per person per night

Gran Hotel or Hotel Monterrey:

Individual: 8.560 pesetas per night
Double: 12.840 pesetas per night

Meli· Confort Salamanca:

Individual: 11.985 pesetas per night
Double: 15.195 pesetas per night

Silken Rona Dalba:

Individual: 9.095 pesetas per night
Double: 10.700 pesetas per night
Breakfast buffet: 1.285 pesetas

Las Torres:

Individual: 9.630 pesetas per night
Double: 12.735 pesetas per night

The are also a couple of camp sites nearby, so if anyone is interested we would be pleased to look for prices, facilities, etc.

Meals:

At the Conference Center (Fonseca) there is a restaurant/canteen where meals are served.
Costs for lunch: 990 pesetas;
dinner: 790 pesetas.
Please take account that although the legal time in Spain is like the rest of Europe, mealtimes are different. Lunch is about 2 pm, and dinner after 9 pm.

Society News

Call for Nominations

It is time once again to elect two officers: a Vice-President-/President-Elect and Treasurer. Under our current by-laws, Linda Mealey becomes the new President on January 1st 2000 (an auspicious date indeed!) Her current position of V-P/P-E therefore becomes vacant at that time. In addition, Barbara Fuller, our current Treasurer, and has elected to step down from her position because of health reasons. We will are miss her active presence as an ISHE officer and wish her well.

Nominations are to be submitted to the Secretary, Karl Grammer (at karl.grammer @univie.ac.at or see Officer's box for address), who will ensure that the nominee is willing to stand for office. Ballotts for the election will be included in the March Bulletin. The duties of the V-P/P-E include seeking invitations for annual meetings, and assuring the scientific quality of the program, substituting for the President when necessary and assuming the role of president at the end of the three year term. The Treasurer is responsible for the receipts and disbursements of the Society's money, for an accurate bookeeping of all credits and debits including the annual financial statement, and for consultation with anyone keeping a Society operating account. The Treasurer also informs the Bulletin Editor on the status of dues and maintains an up-to-date mailing list for the Bulletin.

There is no limit on the number of terms that a person may serve, except that the President may not serve consecutive terms. Each term is normally for three years. ISHE has followed a tradition of maintaining geographic and disciplinary diversity among its officers, but there is no set rule on this.

Welcome Colleen!

We would like to welcome Colleen Schaffner as our incoming Associate Book Review Editor. Her address will now be listed in the editorial staff box.

After much electronic discussion we have decided on a new policy of year-round renewal similar to a typical magazine subscription. Starting with this month's bulletin your mailing label has a bottom line in boldface type that reads "membership expires: mo/yr" indicating the date on which your ISHE membership and HEB subscription expires. (mo/yr). You will then receive reminders attached to the last two issues before your membership renewal is due. If you have recently renewed, but have not received back issues, these may be obtained by sending a

check for $5.00 to the Treasurer for each back issue requested.

Membership in the International Society for Human Ethology is $25.00/yr or $60.00 for 3 years. You may pay by cash, check or a memo (including e-mail memos) authorizing the ISHE Treasurer to charge your VISA or Eurocard a specific amount plus your credit card number and expiration date.

ISHE Financial Statement June1998 to July 1999

DEBITS	
credit card billing costs	$239.70
Bulletin & editor's expenses (1998),	$4,026.00
Bulletin expenses (1999 to June only)	$1,866.42
Treasurer's expenses	$500.00
Debit Total	$6,632.12
CREDITS	
Bank interest	$162.23
1998 Conference revenue	$1,819.36
Sale of mailing list to SAGE	$105.00
Member' dues	$4,347.53
Credit Total	$6,434.12
June1998 balance	$18,083.33
June1999 balance	$17,855.22

2000 ISHE Directory

We are now finalizing our preparations of the new membership directory 2000. If you have not yet submitted your personal information, you should do so now! Your personal info can easily be sent via the internet. I will provide the form like the current email-form, which you can find at the old maillist-form-address: http://evolution.anthro.univie.ac.at/maillist/form.html

If it is not possible for you to use the internet-form or email, please send your data via fax to Astrid Juette (+43-1-31336-788) (Full name (first, last name), title, postal address, tel, fax, working field (max 6 words), email, homepage)

Officers of the Society

President
Charles B. Crawford
Department of Psychology
Simon Fraser University
Burnaby, B.C. V5A 1S6, Canada
tel. 1-604-291-3660
fax 1-604-291-3427
e-mail: crawford@sfu.ca

Vice-President/ President-Elect
Linda Mealey
Psychology Department
College of St. Benedict
St. Joseph, MN 56374 USA
tel. 1-320-363-5481
fax 1-320-363-5582
e-mail: lmealey@csbsju.edu

Vice-President for Information
Peter LaFreniere
(see Editorial Staff box)

Secretary
Karl Grammer
Ludwig-Boltzmann-Institute
for Urban Ethology/Human Biology
Althanstrasse 14
A-1090 Vienna, Austria
tel. 49-815237355
e-mail: karl.grammer@univie.ac.at

Treasurer
Barbara F. Fuller
School of Nursing
University of Colorado
4200 E. Ninth Ave.
Denver, CO 80220 USA
tel. 1-303-315-8929
fax 1-303-315-5666
e-mail: barbara.fuller@uchsc.edu

Membership Chair
Astrid Jütte
Ludwig Boltzmann Institute for Urban Ethology, Institute for Human Biology
Althanstrasse 14
A-1090 Vienna, Austria
e-mail: astrid.juette@bigfoot.com

ANNOUNCEMENTS

The XVIII World Congress of the **International Political Science Association (IPSA)** will meet in Quebec City, August 1-6, 2000. This letter is a call for papers for the panels that will be allotted to Research Committee # 12, "Biology and Politics." If you are interested in delivering a paper, please send an abstract of the proposed paper, with your name, address, institutional affiliation, e-mail (if you have e-mail) to either:

Dr. Albert Somit
Room 256, Lesar Law Building
Southern Illinois University
Carbondale, IL 62901

Dr. Steven A. Peterson
School of Public Affairs
Penn State Harrisburg
777. W. Harrisburg Pike
Middletown, PA 17037
Internet: sap12@psu.edu

In accordance with the IPSA deadline, please send your proposal to us by March 1st, 2000.

INTERNATIONAL SUNBELT SOCIAL NETWORK CONFERENCE

Vancouver, British Columbia April 13-16, 2000

The International Sunbelt Social Network Conference is a major forum for social scientists, mathematicians, computer scientists, and all others interested in social networks. The conference provides an opportunity for individuals interested in theory, methods, or applications of social networks to share ideas and common concerns.

For complete information on the conference, visit:
http://www.sfu.ca/~insna, or contact Bill Richards, School of Communication, Simon Fraser University, Burnaby, BC V5A 1S6, Canada; richards@sfu.ca; (604) 251-3272.

Fondation Jean-Marie Delwart

Award of the Year 2000
Biology of Communication

The Jean-Marie Delwart Foundation will award in 2000 a Prize for an original work or series of works, individual or collective, in the field of **Chemical Communication**, dealing with the specific action of certain substances on organisms and/or with the fundamental mechanisms governing the function of receptors.

Candidates can submit their own application or be nominated by a person competent in the relevant field. All applications should be accompanied by a cover letter, a curriculum vitae, and a complete list of publications, in triplicate, as well as by the works to be considered. The Prize, in the amount of $10,000, will be awarded to works written in or translated in French or English, submitted prior to March 15th 2000 to the following address:

Fondation Jean-Marie Delwart
U.C.L. Batiment Pythagore
4, Place des Sciences (Bte 4)
B-1348 Louvain-la-Neuve
Belgique

Request for Information

Is there any evidence for animal appreciation of the "beauty" of nature? I am currently writing a paper for which I would like to cite either published examples of or even personal anecdotes from individuals who have observed behavior in any animal that suggests an aesthetic appreciation of nature. I'm most interested in the great apes, but any species is of interest.

Please send information on this question to:

Judith Hand, 17615 Parlange Place, San Diego, CA 92128, USA or judithlh@aol.com.

BOOK REVIEWS

Developing a Social Psychology of Monkeys and Apes

By John Chadwick-Jones. Psychology Press, 1998, 192p. [Hdbk. $44.95, ISBN: 0-86377-820-8]

Reviewed by Jessica C. Flack, Psychology Department and Living Links Center, 202 Psychology Building, Emory University, Atlanta, GA, 30022, jflack@emory.edu

Upon discovering this book, my first reaction was one of excitement and anticipation. Like, I suspect, many other researchers in behavioral primatology, I have been searching for literature that integrated the research on nonhuman primate social behavior with human social psychological approaches. The development of a dialogue between the two fields is potentially fruitful, not to mention intellectually stimulating, because each field has different strengths. Of course, a cross-disciplinary dialogue might be difficult to establish because there are theoretical and methodological differences that need be resolved or, at least clarified, before any synthesis can be achieved. Fortunately, the synthesis of information is not the only product of this merger worth seeking. As interesting and useful as a synthesis of the two disciplines might be for understanding behavior, the most useful product of this integration is the transfer and application of the theoretical and methodological approaches from one discipline to the other.

In this book, Chadwick-Jones recognizes and emphasizes the value of integrating the methods and theories of primatology with those of human social psychology. His introduction indicates that the impetus for this book was his belief that the two disciplines not only share much in terms of objectives, but also have much to offer each other in terms of how questions about behavior are framed and empirically answered. He points out that traditionally researchers who study primate sociality tend to focus on ultimate, evolutionary explanations for behavior, while researchers who study human social psychology focus on the proximate or immediate causes of behavior. Chadwick-Jones argues that the fairly exclusive emphasis in both fields on one of the two approaches is inappropriate: At best, doing so only enables us to draw partial conclusions about why we and other social creatures behave the way we do.

The study of facial expressions is useful in illustrating this point. One reason that social psychologists and behavioral primatologists ask about the contexts in which particular facial expressions are used is to extract the social meaning of these expressions. Subsequent questions for social psychologists might, as Chadwick-Jones suggests, emphasize understanding the level of intentionality that use of the signal or expression reflects. For primatologists, subsequent questions more likely concern the evolutionary origins of facial expressions. These questions are valuable in and of themselves and also because they complement each other: The first informs us about the social and cognitive mechanics underlying facial expressions, while the second informs us about why we use facial expressions the way we do.

Chadwick-Jones offers a solution to these disciplinary shortcomings. He suggests that social psychologists employ an evolutionary perspective so as to organize social psychology's variety of independent mini-theories, and that students of primate behavior refocus their attention to the contexts and social triggers of behavior and, temporarily, away from evolutionary causes. As a first step in this process, Chadwick-Jones attempts to show in this book how the proximate approach has been, and can continue to be, fruitfully utilized in the study of primate behavior. He sets out to accomplish this task by reviewing by topic the primate literature in which researchers actually have addressed proximate causes and mechanisms. Unfortunately, the author only refers sporadically back to the human social psychological research during his review. For example, although his facial expression chapter discusses the work of social

psychologists, such as Paul Ekman and Alan Fridlund, as well as the work of primatologists, such as Jan van Hoof and Signe Preuschoft, he fails in a later chapter on dominance and social relationships in nonhuman primates to even mention analogous studies in the human social psychological literature. This leaves the reader grappling with several unanswered questions, particularly regarding why the application of specific social psychological methods to primate research is warranted or useful. Chadwick-Jones' failure to consistently reference social psychological studies and use them as examples also leaves the reader feeling that for no particular reason some topics were treated in less detail than others. The best and most detailed chapters in the book are those covering primate vocal and nonvocal signaling.

In his introduction, Chadwick-Jones begins to address the question of why primate researchers who study behavior should bother to focus on proximate mechanisms. I hoped that the remainder of the book would be devoted to illustrating through examples and comparison why this is useful and how it could be accomplished. I found, however, that even by the end of the book these questions remain inadequately answered; the author provides little evidence of why and how studying the proximate causes of behavior has been a useful approach in human social psychology. For example, although Chadwick-Jones does emphasize how primatologists' understanding of behavior could benefit from detailed, sequential analysis, he does not discuss the advantages of employing a social psychological version of this approach as opposed to an ethological version. Furthermore, it is not clear from the book why Chadwick-Jones believes there is any need to shift the attention of primate researchers to proximate mechanisms when it appears from his review to have been significantly focused in this way already.

To Chadwick-Jones' credit, he does identify questions that still need to be addressed and for which more data are needed before we can fully and accurately understand the social meaning of behavior. He also provides examples of how failure to attend to proximate causes can lead us to draw incomplete or even incorrect conclusions. In his discussion of key signals, for example, he describes how 'genital touching' -- now understood as an important aspect of baboon greeting behavior -- was ignored by researchers who did not examine closely enough the sequence of events that led to a successful greeting. The identification of 'genital touching' as a key signal in baboon greetings enabled researchers to operationally distinguish successful from unsuccessful greetings. Chadwick-Jones rightly uses this example to underscore the importance of detailed descriptions of the contexts in which the signals are given and received, and of signals themselves, for understanding and interpreting a signal's meaning.

Although Chadwick-Jones clearly articulates his intention to improve our understanding of proximate causes of behavior in primates, he devotes sections of his book to questions outside of social psychology. His chapter on sexuality in monkeys and apes, for example, includes a discussion of factors such as sexual dimorphism that are thought to influence the emergence of particular mating systems. Although an important topic, this section seems out of place in this book because its focus is not on immediate social or contextual causes of behavior but on supposed determinants of social/mating systems. Inclusion of these kinds of sections would be more justified in a book in which the evolutionary or ultimate causes and the proximate causes of behavior were treated in equivalent depth by the author.

Chadwick-Jones' title was well conceived both in terms of its implications and its timing. Although a few primatologists (e.g. Jan van Hoof, Frans de Waal) have been developing a social psychology of monkeys and apes for years, there has been no attempt until now to really unify and review what is known about the proximate social mechanisms of behavior within a framework where evolutionary causes are considered, but considered secondarily. In this sense, Chadwick-Jones' book makes an important contribution. I am not sure, however, that Chadwick-Jones accomplishes the objectives implied by the title and set forth in the introduction. In-depth comparison of studies

within the two fields is required in order to extract a specific and logical agenda from the synthesis to serve as a guide for future research. Perhaps the problem is not, however, with Chadwick-Jones' review but with the limitations of the two fields he sought to integrate. It may be that it is not possible to develop a detailed research plan for the study of the proximate causes of primate behavior by drawing only from social psychology. Any serious attempt to fully understand primate behavior most likely requires that we draw from and integrate behavioral neuroscience, behavioral endocrinology, and social anthropology as well as social psychology.

Bulletin Submissions

All items of interest to ISHE members are welcome: Society Matters; articles; replies to articles; suggestions; announcements of meetings, journals or professional societies; etc. These sorts of submission should be sent to the editor. Book review inquiries should go to the book review editor. All submissions should be in English, and sent to the appropriate editor via e-mail, as an attachment in order to maintain formatting. If e-mail is impossible, hard copies will be accepted, as long as they are accompanied by the same text on diskette (preferably in Microsoft Word version 6.0 or earlier). Shorter reviews are desirable (less than 1000 words). **Please include complete references for all publications cited.** For book reviews, please include **publisher's mailing address and the price of hardback and paperback editions.**

Submissions are usually reviewed only by the editorial staff. However, some submissions are rejected. Political censorship is avoided, so as to foster free and creative exchange of ideas among scholars. The fact that material appears in the newsletter never implies the truth of those ideas, ISHE's endorsement of them, or support for anythem.

Affective Neuroscience: The Foundations of Human and Animal Emotions

by Jaak Panksepp, Oxford University Press, 1998.

Reviewed by Alan M. Rosenwasser,
Department of Psychology, University of Maine, Orono, ME 04469, USA

At its most fundamental level, this is a book about the neural representation of emotional and motivational states. The book is organized into three major sections: Part 1 consists of several chapters laying out the scope, objectives, and conceptual foundations for the rest of the text, followed by a block of chapters providing an overview of neuroanatomy, neurophysiology, and neurochemistry, with emphasis on topics of special relevance to the study of affect. Part 2 consists of a series of chapters each devoted to a consideration of the neural mechanisms of a specific basic affective-behavioral system, including those systems controlling sleep and arousal, appetitive motivation, homeostatic regulation (especially feeding), anger, and fear. Finally, Part 3 explores the neural mechanisms underlying the more complex social emotions, including those related to sexuality, maternality and nurturance, and peer interactions. In the final and most speculative chapter, Panksepp explores linkages between brain function, emotion, consciousness, and self-awareness. While this book presents primarily a neuroscience approach to understanding animal and human behavior, it should be emphasized that Panksepp maintains strong comparative and evolutionary perspectives throughout the text. In this vein, one of the author's major themes is that the behavioral functions of neural circuits can only be understood if one is working within the framework of a realistic behavioral taxonomy, which in turn can only be derived from a comparative perspective on behavior. Nevertheless, the focus is almost entirely on

vertebrate — and even more specifically, on mammalian — brain and behavior. Indeed, Panksepp argues forcefully throughout the text that the general homology of neuroanatomical organization across the Mammalia implies a high degree of psychological continuity among these species. Invertebrates are mentioned only to make the point that the capacity of the vertebrate brain to produce emotional and motivational states imparts greatly increased behavioral flexibility and learning capabilities in these species, and Panksepp explicitly suggests that dramatic differences in the organizational plan of the vertebrate and invertebrate nervous systems mean that we may never fully understand the psycho-behavioral world of the invertebrates.

Indeed, Panksepp's objectives in this book are rather far-reaching and ambitious, and go well beyond the presentation of a textbook-style treatment of current research on mammalian neurobehavioral dialectics. This is a book about *ideas*, including several unpopular or at least controversial ideas in behavioral neuroscience; it is definitely *not* a comprehensive review of the primary literature on brain and emotion, nor is it a textbook. Researchers in the brain and behavioral sciences have long debated the value of psychological constructs — and especially of psychological constructs related to various facets of emotion and motivation — in the analysis of neurobehavioral systems. One view has been that psychological constructs serve as temporarily useful but ultimately misleading cover stories, obscuring our ignorance of the cellular, neurochemical, and neuroanatomical mechanisms of behavior. According to this view, as we come to better understand these mechanisms, from sensory input, through information processing, to motor output, the apparent utility of psychological constructs will fade and eventually disappear. Thus, the continued presence of terms like *drive*, *hunger*, and *fear* in our analyses of brain-behavior relationships only shows how far we still must go towards a complete mechanistic explanation. Conversely, the opposing view claims that specific emotional and motivational states arise from activity within specific neural circuits, and indeed, that the production of affective states is seen as the evolutionary adaptive function of these circuits. According to this view, in addition to the neural mechanisms producing stereotyped agonistic and aggressive behavior patterns, there are also specific neural mechanisms generating *anger* and the corresponding *motivation* to attack. Panksepp is a champion of the latter view, and then some. Indeed, the text is sprinkled liberally with terms like *rage*, *hope*, *lust*, *joy*, *eagerness*, and even *love*, used to describe the behavior of non-human animals. Further, Panksepp is *not* simply employing these terms as a convenient shorthand, as one commonly uses the label "fear conditioning" to refer a conditioned postural response such as freezing. Instead, Panksepp is using these terms because he believes strongly that other mammalian species experience basic emotions such as rage, hope, and fear in very much the same way we do, at least at the level of the "raw" emotional feeling. Thus, differences in the subjective experience of fear between rats and people reflect differences in the potential for cognitive elaboration provided by an extensive neocortex, but not in the neural mechanisms or psychological phenomenology of the basic emotions.

In making these arguments, Panksepp at times appears to view his work as an attempt to save psychology from an otherwise uncertain future. He argues that an enormous intellectual breech has opened between what has traditionally been called physiological psychology and the other branches of psychology; indeed, this breech is manifest in the recent tendency of physiological psychologists to refer to themselves as behavioral neuroscientists. Further, he attributes this breech to the lingering influence of *behaviorism* within behavioral neuroscience. While the so-called *cognitive revolution* has allowed psychologists in other sub-fields to once again be comfortable with the idea that subjective experience can be a valid and important aspect of psychological science, behavioral neuroscientists largely continue to explain behavior without reference to conscious, subjective experience, and largely continue to reject all forms of inference concerning the mental activities of their subjects, especially when those subjects are animals. At most, behavioral neuroscientists tend towards an agnostic position regarding subjective experience, believing that even if

such subjective phenomena do occur in animals, they occur as epiphenomenal byproducts of neuronal activity. According to Panksepp, however, emotional feelings not only exist in animals, but are a critical component of the causal mechanisms of behavior, conferring upon emotional organisms a level of behavioral plasticity and adaptability that would be otherwise impossible. According to his view, it is simply impossible to achieve a full understanding of mammalian behavior or of the functional organization of the mammalian brain without allowing a place for subjective experience in one's modeling. Thus, Panksepp argues that the scientific psychology of the 21st century must strive towards a coherent integration of physiological, behavioral *and* experiential events. Perhaps most striking to one who was trained in psychology when it was still defined in textbooks as "the science of behavior" is the way Panksepp repeatedly draws a distinction between behavioral and psychological (by which he means "mental") phenomena. From this perspective, I assume that the title of Panksepp's book was chosen to emphasize the analogy between *affective neuroscience* and the increasingly prominent discipline of *cognitive neuroscience,* since the latter has also struggled to find the best way to view complex relationships among neural activity, objective behavioral responses, and conscious subjective experience. Even in cognitive neuroscience, however, researchers have typically approached such issues more cautiously than Panksepp, choosing to emphasize the relative importance of *unconscious* internal 'representations,' rather than consciously-experienced 'thoughts.'

Panksepp's overall conceptualization of brain-behavior relationships derives directly from MacLean's conception of the triune brain. According to this well-known view, vertebrate brain evolution has been largely a process of caudal-to-rostral growth, in which newer structures (and attendant behavioral capabilities) are added 'above' older structures, while retaining the basic organizational plan of the older underlying structures. The hierarchically lowest and phylogenetically oldest level of the neuraxis, the 'reptilian' brain, comprises a set of structures (the basal ganglia) that govern the spatiotemporal patterning and sequencing of complex stereotyped movements; the midlevel 'paleomammalian' brain comprises a set of structures (the limbic system) that underlie the elaboration of basic affective and motivational processes; and the newest 'neomammalian' brain systems (the neocortex) underlie high-level cognition, perception, and information processing. Since the reptilian and paleomammalian brains are essentially preserved within the core of the neomammalian brain, the principle of evolutionary homology would suggest that these structures would have very similar behavioral functions throughout the vertebrates. To the extent that basic affective processes are regulated by and represented within limbic circuits of the paleomammalian brain, it is reasonable to assume that these circuits play a very similar role in all mammalian species including humans.

Now, most behavioral neuroscientists accept this general plan — to a point. Thus, it is widely agreed that neural circuits of the limbic brain — defined broadly to include not only telencephalic structures such as the amygdala and hippocampus, but also certain structures at the telencephalic-diencephalic border (the so-called basal forebrain: e.g., septum, preoptic area, bed nucleus of the stria terminalis) as well as hypothalamic and mesencephalic (i.e., the periaqueductal gray) structures — play a preeminent role in the display of the behavioral and physiological manifestations of emotional and motivational states. Fighting, fleeing, mating, and parenting behaviors, among others, as well as the autonomic and neuroendocrine concomitants of such behaviors, are clearly controlled and coordinated by limbic circuits. Unlike most neuroscientists, however, Panksepp is not at all content to discuss the neural coordination of emotional *behaviors* and corresponding physiological regulations. Instead, as indicated above, Panksepp is at least as interested in the possibility that animals also possess "affective consciousness" in the form of subjectively-experienced, primary-process, "raw" emotional feelings. According to Panksepp, if we accept (as we must) the reality of emotional feelings in humans, and if such feelings in humans can be shown to emerge from activity within limbic circuits (in my view, the weak link in the argument), then the general

neuroanatomical homology of the subcortical brain among all mammalian species strongly implies similar subjective emotional experiences in these species. These ideas are not the modal view within behavioral neuroscience. It is probably true that most neuroscientists believe that subjective experience, whether 'cognitive' or 'affective,' is a high-level neocortical phenomenon. As Panksepp discusses, such a view fits well with the prevalent social-constructionist view of emotion, in that evolutionarily advanced cognitive neocortical processes underlie emotional experience. While leaving the door open to the possibility that certain higher-order manifestations of emotion (guilt, embarrassment, etc.) may involve social-cognitive constructions, Panksepp argues that a number of basic emotions, including *fear*, *anger*, *seeking* (e.g., drive or anticipatory eagerness), and *panic* (e.g., distress associated with loss of social support), are not social constructions but rather biological realities dependent on the activation of functionally specific neural mechanisms. Thus, Panksepp believes that at least the most basic emotions can be clearly separated from cognition, and raw feelings from thoughts, even though in highly corticalized brains such as our own, the two may blend together almost seamlessly as we engage our cortical-cognitive devices in attempting to better understand and control our subcortical-affective core feelings. This argument ultimately culminates in the final chapter of the book, in which Panksepp suggests that affective consciousness is the primordial form of consciousness, emerging in its most primitive form from deep within the reptilian brain, at the level of periaqueductal midbrain circuits.

As should be apparent, I certainly found this book to be provocative and challenging. Even though I have emphasized the largest theoretical issues, the book also contains an abundance of creative synthesis, analysis, and interpretation of specific research areas within mammalian emotion and motivation. Just to list a few selected examples, Panksepp has very interesting things to say about the evolutionary functions of REM sleep, about the distinct neural representation of appetitive and consummatory behaviors, and about the neurochemistry of social bonding. There should be enough food for thought in these pages to stimulate and satisfy readers with primary interests in behavior, in evolution, or in neuroscience. On the other hand, in my view, this book may be less appropriate for the educated lay reader who may be seeking an entertaining semi-popular treatise on brain and behavior. And, as mentioned above, this is not really a textbook, and probably not even a graduate-level textbook, unless one is teaching a cadre of graduate students with substantial theoretical and empirical background in biology and psychology.

Finally, let me say what I liked *least* about this book. The author has chosen to forgo the standard style of footnoting and referencing, and instead provides an extensive collection of 'notes' that run about 90 pages in length at the end of the book. These notes are over 25% as long as the primary text itself, and in some cases there are more than 100 notes referred to in a 20 page chapter. Indeed, there are some sections of the text where four or five notes are referenced in a single paragraph. I found this organization to be highly distracting, requiring the reader to keep a bookmark inserted within the notes, and to frequently flip back and forth between the notes and the primary text. This problem is compounded further by the fact that many notes contain only a simple literature reference or two, while others contain lengthy explication of some point raised in the text. Personally, I found many of the notes to be redundant with the text, and many others that could have been easily incorporated into the text rather than being presented as a note. Overall, this made the book less fun to read than it might have been.

In sum, this book presents a provocative and bold treatment of some difficult issues in the biobehavioral sciences, and should provide valuable reading for professionals and graduate students in biological psychology, animal behavior, and neuroscience.

This is Biology: The Science of the Living World

By Ernst Mayr, The Belknap Press, Cambridge, MA, 1997,332 pp.

Reviewed by William R. Charlesworth, P.O.Box 18. Stockholm, WI 54769 US

Human ethology has its historical and conceptual foundations in biology, a point Eibl-Eibesfeldt (1974,1984) the chief architect of the discipline has been making for decades. Yet it appears that more than a few behavioral scientists (many leading developmental psychologists for example--v. Ghiselin, 1986, Charlesworth, 1992) believe they could assimilate biology to their own discipline without having to accommodate to biology's fundamental principles.

Accommodation to a scientific discipline obviously requires that one understands its basic principles. Getting properly exposed to the principles, however, is often a problem. One must be motivated to make the effort. Also, some expert must spell out the principles for the non-expert clearly, concisely, and coherently, a task for which only a few are capable.

In the discipline of biology, Mayr is one of these few. The clarity of his style, the range of his coverage, and his relentless insistence on a clear understanding of what modern biology is all about makes the present volume a classic. Every ethologist should read it twice and at least once again five years later.

The volume's contribution to the conceptual foundation of biology ranges across a broad spectrum of general topics--the various meanings of life as seen by many thinkers, the nature of science and how it explains the natural world, and the great abundance of interlocking concepts that characterize evolutionary theory.

In companion chapters, "How does science explain the natural world?" and "How does biology explain the living world? ", Mayr covers such broad topics as verification and falsification in science, models of scientific explanation, discovery and justification, common sense realism and also spends welcome time on clear definitions of facts, theories, laws, and concepts.

Mayr then goes on to more specific biological topics such as proximate and ultimate causation, "open and closed programs" (his elegant, common sense solution to the nature and nurture problem), and cognitive evolutionary epistemology.

In the chapter, "How are the life sciences structured", Mayr sets the conceptual stage specifically for the study of evolution. In it he contrasts comparative and experimental dimensions of biology. Further on, he elaborates on biologists' traditional concern with three questions--the historically-early "What?" questions (the study of biodiversity per se), the increasingly-prominent "How?" questions (the making of a new individual) and finally the "Why?"questions (the evolution of organisms) now so familiar to contemporary evolutionary theorists.

In Chapter 9 Mayr presents his now well-known "diagram" of Darwin's model of evolution through natural selection (five facts and three inferences). Included is a discussion of the importance of ecology for understanding evolution (something many human ethologists and evolutionary psychologists could pay more attention to) and how humans fit into the evolutionary picture.

In all of this Mayr stresses the two dominant viewpoints represented by Darwinian biology--a holistic view of life and its evolutionary history. He also notes that both viewpoints have lost much ground during the present century under pressure from explanatory models developed by physicists and the unprecedented technological advances flowing from them. In this context it should also be added that the significance of evolutionary history declined during much of the 20th Century under the impact of environmentalism (both scientific and ideological) which

downplays the role innate factors play in animal and especially human behavior.

Throughout most of the volume, Mayr deals with the major concepts that specifically make up current evolutionary theory -- biodiversity, population and typological thinking, selection, territory competition, reproduction, female choice, various forms of altruism, as well as others.

The weakest section of this book, in my estimation, is in his final chapter "Can Evolution Account for Ethics?". After a compelling defense of group selection, Mayr asks, and then tries to answer, the question "What moral system is best suited to humankind?"

With this question Mayr moves from description and explanation to prescription. However, such a move, in my estimation, is neither necessary for a scientific treatise nor logically derivative from evolutionary theory. "What is" and "what should be" the case is a problem that has been struggled with for centuries. Grappling with it again is not necessary.

But this is a negligible weakness. Overall, this volume is a winning achievement by one of the original architects of the synthetic theory of evolution and by the theory`s most articulate spokesman.

For ethologists, not knowing the contents of this volume is like attempting to practice law in the U.S. without having read and understood The Constitution of the United States. It won't work.

If you had one volume on biology to begin the 21st Century this should be the one.

References

Charlesworth, W.R. (1992) Darwin and developmental psychology. Developmental Psychology, 28,5-16.

Eibl-Eibesfeldt, I. (1975) Ethology: The biology of behavior,(rev. ed.). New York: Holt, Rinehart and Winston.

Eibl-Eibesfeldt, I. (1984) Die biologie des menschlichen Verhaltens: Grundriss der Humanethologie, Munchen: Piper.

Ghiselin, M. (1986) The assimilation of Darwinism in developmental psychology. Human Development, 29,12-21.

Entwined Lives: Twins and What They Tell Us About Human Behavior.

By Nancy L. Segal. New York: Dutton (member of Penguin Putnam Inc.). US$27.95, CAN$39.99. ISBN 0-525-94465-6. Hard cover 396 pp. Black and white photographs.

Reviewed by Susan A. Treloar (who is herself an MZ twin) Queensland Institute of Medical Research, and Joint Genetics Program, The University of Queensland PO Royal Brisbane Hospital Queensland 4029, Australia

The study of twins contributes enormously to knowledge about genetic and environmental influences on behaviour, health and development. A new book, Entwined Lives: Twins and What They Tell Us About Human Behavior, offers privileged insights into these connections. The author, Nancy L. Segal Ph.D. is well known and highly respected in the fields of twin research, genetic epidemiology and developmental psychology. Segal is currently Professor of Developmental Psychology and Director of the Twins Studies Center at California State University, Fullerton, USA. Segal has published numerous scientific papers on twins. She was contributing research editor of Twins magazine from 1984 to 1998 and has co-edited a previous book entitled "Uniting Psychology and Biology", one of her academic passions. However, she is particularly associated with the work of the Minnesota Center for Twin and Adoption Research, where she served as Assistant Director from 1985 to 1991. The Center itself is best known for its studies of twins reared apart and reunited later in their lives.

Entwined Lives is much more than a book about twins. It is also about research and

the academic pursuit of scientific truth. Segal should inspire young students to follow a human research path. Entwined Lives would make very useful required reading for undergraduate students in a wide range of fields. I think the book will help students and academics (who are not necessarily in these fields and who are not necessarily twins) to enjoy the insights and experiences of the inside world of a researcher recounted with honesty, warmth and empathy. The researcher comes to life; she is professional, clever, a great communicator and loves what she does! Nancy Segal writes with verve and enthusiasm in a style which will appeal to the general reader, as well as to the academic interested in psychology, behavior genetics, evolutionary biology and ethology. Although packed with detail, Segal's style is expansive, not intensely theoretical. There are extensive notes and references for each chapter, and a Glossary to explain more technical terms, which are avoided where possible.

Insights from evolutionary psychology are provided; there are novel and stimulating analogies, examples and links. For example, in a chapter on twins' special relationship, Segal takes over three pages to simply and clearly explain Darwinian theory, natural selection, altruism, and inclusive fitness. She draws in other research and analyses evolutionary predictions about altruistic behaviors, highlighting Steven Pinker's distinction between individuals' "real motives" and genes' "metaphorical motives". But while noting the freshness of evolutionary psychological perspectives, Segal also raises the controversial effect of these views, and concern that researchers have slighted environmental effects.

Readers will have different reasons for wanting to consult one or more of the book's 16 chapters -facts about twins and twinning, practical information, guidance, and entertainment. There are interesting monochrome photographs in the book, which illustrate important points about study designs, zygosity, twin similarities and differences. That the chapters are relatively self-contained makes the book easy to dip into. Chapters cover a wide range of topics, including some unusual ones – twins in the courtroom, non-human twins, noteworthy twins and conjoined twins. There is a clear leaning towards the psychological and the author's areas of expertise, for example, Chapter 4, Developing in Tandem: Intelligence and Special Mental Skills. Chapter 5, devoted to personality traits, mental disorders and atypical behaviors, provides a good example of the book's style. Segal not only summarizes and interprets twin study findings on psychopathology; she also adds many personal touches. As an illustration, the question of whether higher MZ cotwin concordance for suicide reflected a genetic predisposition or the deeper sense of loss by MZ rather than DZ twins of a cotwin's suicide, was important to resolve. Segal notes "I wondered if an answer lay hidden in our sea of data when the elusive research strategy became clear: It was important to compare suicidal attempts between identical twins and fraternal twins whose partners' deaths were not due to suicide." (p.92). The chapter concludes with a scan of problematic behaviors where genetic influences have been identified. This is preceded by some possible answers to the evolutionary question -- why do these debilitating behaviors remain in the population when they cause such pain?

There is much beyond the well-publicized theme of reared-apart twins to captivate readers, although it makes Chapter 7 a most engaging chapter. Novel insights are provided -- for example, evolutionary reasons for the differing responses of identical and nonidentical twins to their newfound twinship, showing the importance of genetic and environmental influences in shaping social relations. The explanatory relevance of evolutionary theory to feelings of closeness between people with differing biological relatedness is also explored (especially pp. 146-151). Other chapters also focus on twins' special relationships (Chapter 6, Friendship Extraordinaire, and Chapter 9, Lonesome Crowd: Loss of a Twin). In the latter chapter, Segal briefly reviews evidence linking child abuse and biological relatedness. In one of the book's longer direct discussions of evolutionary perspectives, Segal explores in Chapter 6 (pp. 112-115) the notion of genetic sexual attraction (GSA) between reunited relatives, and offers examples of married

couples who turn out to be nonidentical dizygotic twin pairs separated at birth. She suggests GSA as an area for further research. Segal introduces and explains the new field of evolutionary jurisprudence towards the end of Chapter 14, on twins in the courtroom.

Many readers will find Chapter 10 -- "Making Multiples: New Fertility Treatments and Beyond" -- of interest given the prevalence of assisted reproductive technologies. Topical issues such as cloning humans are dissected and challenging ideas are expounded. Chapter 8 on children adopted together will also be of interest to the general reader, especially to those from families where children have been adopted. Chapter 12 is devoted to twins in the nonhuman animal kingdom. This chapter brims with facts about twinning in humans and other animals, with ideas about evolutionary influences on twinning, with discussions of subjects as diverse as olfactory identification of kin, parenting patterns, and the creation of genetically identical animals by nuclear transfer or embryo splitting. One delightful feature of this chapter is the personal touch of including the names of many twin animals (for example, the orangutans Trick and Treat, Dr. Jane Goodall's chimpanzees Gyre and Gimble, and the Australian koalas Edward and Pooh).

The book concludes with a chapter (Chapter 16, Double Entendre: Twinship's Many Meanings) in which Segal draws together and summarizes some key points -- from findings of twin studies, methodological issues such as the equal environments assumption, and other potential biases, e.g. social, primary and recruitment. She defends twin research methods clearly and well, although quite briefly and with few references to the many pertinent published papers, thereby clearly aiming for the general reader. In this chapter, Segal is also not afraid to tackle very serious issues head on, for example Mengele's experiments on twins, child abuse, stresses on parents and siblings of twins, and not-so-happy relationships between cotwins.

In Sum, Segal raises and reviews many evolutionary issues throughout the book and brings behavior genetics to life with enthusiasm and offers it to all to enjoy.

Master Control Genes in Development and Evolution: The Homeobox Story

By Walter J. Gehring. Yale University Press, P.O.Box 209040. New Haven, CT 06520-9040, 1998, 236 pp. Hdbk, $37.00, ISBN 0-300-07409-3.

Reviewed by Agnaldo Garcia, Institute of Psychology, University of São Paulo, Rua Húngara, 396, São Paulo, SP, 05055-010, Brazil. E-mail: agnaldo.garcia@uol.com.br.

The fruit fly Drosophila melanogaster is subject to several odd mutations. One of them gives rise to a whole leg instead of an antennae on the head of the insect. In other cases, the mutant fly may present four wings instead of two wings and two halteres. These mutations, called homeotic transformations, have proved to be excellent material for the investigation of how genes act in development and evolution. This was the subject of the Terry Lectures given by Walter J. Gehring in the Fall of 1993 at Yale University, on which this book is based.

The author, a developmental biologist and professor in the Department of Cell Biology at the University of Basel, Switzerland, presents and discusses the action of genes in development and evolution, including the role of genetic control on these odd mutations. Gehring's own investigations, which have reached the pages of Science and Nature, among other important scientific journals (e.g., Gehring, 1987) are interwoven with the contributions of other authors, supplying a vivid and clear historical view of the field of developmental biology in the last three decades. The author aimed at elucidating "the genetic program that controls development and evolution" (p. xiii), investigating how much of the developmental program is written into our genes, and providing key elements to the understanding of how multicellular organisms develop.

The investigation of these odd mutations in the fruit fly, especially that transforming the antennae on the head of the fly into a leg, has generated important discoveries concerning

homeotic genes. One of the first steps in Gehring's long term research program was the isolation of the homeotic gene Antennapedia, responsible for the transformation antennae-leg.

The research about homeotic genes resulted in the discovery of the homeobox, in 1983, a characteristic DNA segment found in the homeotic genes of different organisms, from the fruit fly to humans. The homeobox was described as a small, 180-base-pair DNA segment that becomes translated into the homeodomain, gene regulatory proteins that regulate batteries of target genes, whose molecular structure has also been investigated. The proteins encoded in the homeoboxes of different animal groups are quite similar. It was verified that fruit flies and humans share 98% of the structure of the homeodomain proteins. The first 59 amino acids are the same and they occupy the same position. Only the last one is different! The discovery of the homeobox contributed directly to the understanding of how master control genes control the development of organisms.

The development of the eye is the example examined by the author to show the universality of the genetic control of development. According to Gehring, eyes as different as those of humans, squids, and flies, develop under the same master control genes. It has been also demonstrated that the control of the wiring of the nervous system is made by homeotic genes, especially in reading positional information.

Master control genes may be responsible for the control of hundreds or even thousands of target genes forming a genetic circuit in a signaling cascade. Apparently, a single master control gene can switch on the eye developmental program, which involves more than 2,500 other genes needed for eye morphogenesis. Gehring, then, suggests that a single maturing system of developmental control has produced all the variety of biological life that we know today, from insects to man.

The way genes control development is a complex question. Gehring recognizes European and American ways of development, each way suffering a different genetic control. In the former, ancestry is what counts; i.e., the cell will follow a developmental path already present in itself. In the latter, what counts are the interactions with its neighbours; i.e., development will depend on the interactions of a cell with those near to it. Although there is a great variety of modes of development regarding fixity/flexibility, they are all genetically controlled. Genes controlling development may perform different tasks. In morphogenesis, for instance, "the body plan is subdivided first by the gap genes into broad domains, then by the pair-rule genes into segmentally repeated units, and last by segment-polarity genes into compartments" (p.121).

The way genes act in evolution and development is of utmost importance for behavioral research. The master gene control of eye development and the wiring of the nervous system are good examples of how this research field may give new answers and raise new questions for behavioral scientists.

I. Reference

Gehring, W.J. (1987). Homeo boxes in the study of development. Science, 236, 1245-1252.

New Books for Review

Barnard, A., & Spencer, J. (eds.) (1999). Encyclopedia of Social and Cultural Anthropology. Routledge. 688 p., US $39.99/UK £24.99 (pbk). ISBN/ISSN: 0-415-20318-X.

Blackmore, S. (1999). The Meme Machine. NY: Oxford University Press. 288 pp. $25.

Chisholm, J. S. (1999). Death, Hope and Sex: Steps to an Evolutionary Ecology of Mind and Morality. NY: Cambridge University Press. circa 300p., $28 (pbk). ISBN 0-521-59708-0.

Courtillot, V. (1999). Evolutionary Catastrophes: The Science of Mass Extinction. Cambridge: Cambridge University Press. 173 pp. ; $24.95 ISBN:0-521-58392-6.

Cummins, D. D., & Allen, C. (1998). The Evolution of Mind. NY: Oxford University Press. 272 pp. $35.

Cronk, Lee (1999). That Complex Whole: Culture and the Evolution of Human Behavior. Boulder, C: Westview Press. 175p. $20 (pbk.). ISBN 0-8133-3705-4 [hdbk., $40. ISBN 0-8133-3704-6]

Fivaz-Depeursinge, E., & Corboz-Warnery, A. (1999). The Primary Triangle: A Developmental Systems View of Mothers, Fathers, and Infants. NY: Basic Books. 256pp, $42 (£28.95). ISBN 0-465-09582-8.

Houston, A.I. & McNamara, J.M. (1999). Models of Adaptive Behavior: An Approach based on State. Cambridge: Cambridge University Press. 378 pp.; $80. ISBN:0-521-38480-X.

LaFreniere, P.J. (2000). Emotional Development: A Biosocial Perspective. Belmont, CA: Wadsworth/ITP. 352 pp. $67.95. ISBN# 0-534-34808-4, www.wadsworth.com

Langer, J., & Killen, M. (1998). Piaget, Evolution, and Development. NJ: Lawrence Erlbaum. 328pp., Hdbk., $55. ISBN 0-8058-2210-0.

Tiger, Lionel (1999). The Decline of Males. NY: Golden Books. 325p. $23 (hdbk). ISBN 1-58238-014-7.

CURRENT LITERATURE

December 1999

Compiled by Johan van der Dennen

Abe, J.A.A. & Izard, C.E. (1999) The developmental functions of emotions: An analysis in terms of differential emotions theory. *Cognition and Emotion*, 13, 5, 523-549 (So Connecticut State Univ., Dept. Psychol., New Haven, CT 06515, USA)

Aber, J.L., Belsky, J, Slade, A. & Crnic, K. (1999) Stability and change in mothers' representations of their relationship with their toddlers. *Developmental Psychology*, 35, 4, 1038-1047 (Columbia Univ., Natl. Ctr. Childrens Poverty, 154 Haven Ave, New York, NY 10032, USA)

Aksan, N., Goldsmith, H.H., Smider, N.A., Essex, M.J., Clark, R., Hyde, J.S., Klein, M.H. & Vandell, D.L. (1999) Derivation and prediction of temperamental types among preschoolers. *Developmental Psychology*, 35, 4, 958-971 (Univ. Wisconsin, Dept. Psychol., 1202 W Johnson St, Madison, WI 53706, USA)

Arnold, D.H., Homrok, S, Ortiz, C. & Stowe, R.M. (1999) Direct observation of peer rejection acts and their temporal relation with aggressive acts. *Early Childhood Research Quarterly*, 14, 2, 183-196 (Univ. Massachusetts, Dept. Psychol., Tobin Hall, Box 37710, Amherst, MA 01003, USA)

Bar-Yosef, O. & Kuhn, S.L. (1999) The big deal about blades: Laminar technologies and human evolution. *American Anthropologist*, 101, 2, 322-338 (Harvard Univ., Peabody Museum, Cambridge, MA 02138, USA)

Barnfield, A.M.C. (1999) Development of sex differences in spatial memory. *Perceptual and Motor Skills*, 89, 1, 339-350 (Univ. Western Ontario, Brescia Coll., 1285 Western Rd, London, ON N6G 1H2, Canada)

Benenson, J.F., Philippoussis, M. & Leeb, R. (1999) Sex differences in neonates' cuddliness. *Journal of Genetic Psychology*, 160, 3, 332-342 (McGill Univ., Dept. Educ. & Counselling Psychol., 3700 McTavish St, Montreal, PQ H3A 1Y2, Canada)

Bird, R. (1999) Cooperation and conflict: The behavioral ecology of the sexual division of labor. *Evolutionary Anthropology*, 8, 2, 65-75 (Univ. Arkansas, Dept. Anthropol., Fayetteville, AR 72701, USA)

Blass, T. (1999) The Milgram paradigm after 35 years: Some things we now know about obedience to authority. *Journal of Applied Social Psychology*, 29, 5, 955-978 (Univ. Maryland Baltimore Cty, Dept. Psychol., 1000 Hilltop Circle, Baltimore, MD 21250, USA)

Bosacki, S. & Astington, J.W. (1999) Theory of mind in preadolescence: Relations between social understanding and social competence. *Social Development*, 8, 2, 237-255 (Dalhousie Univ., Dept. Psychol., Halifax, NS 3BH 4J1, Canada)

Brenner, V. & Fox, R.A. (1999) An empirically derived classification of parenting practices. *Journal of Genetic Psychology*, 160, 3, 343-356 (Fox, R.A.: Marquette Univ., Parenting Ctr., 749 N 17th St, POB 1881, Milwaukee, WI 53201, USA)

Bruce, C. & Fox, G.L. (1999) Accounting for patterns of father involvement: Age of child, father-child coresidence, and father role salience. *Sociological Inquiry*, 69, 3, 458-476 (Univ. Tennessee, Knoxville, TN 37996, USA)

Burger, J.M. & Cosby, M. (1999) Do women prefer dominant men? The case of the missing control condition. *Journal of Research in Personality*, 33, 3, 358-368 (Santa Clara Univ., Dept. Psychol., Santa Clara, CA 95053, USA)

Burks, V.S., Laird, R.D., Dodge, K.A., Pettit, G.S. & Bates, J.E. (1999) Knowledge structures, social information processing, and children's aggressive behavior. *Social Development*, 8, 2, 220-236 (Univ. Penn., Dept. Child Psychiat., Room 250, 111 North 49th St., Philadelphia, PA 19139, USA)

Busjahn, A., Faulhaber, H.D., Freier, K. & Luft, F.C. (1999) Genetic and environmental influences on coping styles: A twin study. *Psychosomatic Medicine*, 61, 4, 469-475 (Humboldt Univ., Franz Volhard Clin., Wiltbergstr. 50, D-13122 Berlin, Germany)

Call, J., Aureli, F. & de Waal, F.B.M. (1999) Reconciliation patterns among stumptailed macaques: A multivariate approach. *Animal Behaviour*, 58, Part 1, 165-172 (Univ. Liverpool, Sch. Biol. Sci., Nicholson Bldg, Liverpool L69 3BX, Merseyside, England)

Campbell, D.W. & Eaton, W.O. (1999) Sex differences in the activity level of infants. *Infant and Child Development*, 8, 1, 1-17 (Univ. Manitoba, Dept. Psychol., Winnipeg, MB R3T 2N2, Canada)

Casey, M.B., Nuttall, R.L. & Pezaris, E. (1999) Evidence in support of a model that predicts how biological and environmental factors interact to influence spatial skills. *Developmental Psychology*, 35, 5, 1237-1247 (Boston Coll., Dept. Counseling Dev. & Educ. Psychol., 201 Campion Hall, Chestnut Hill, MA 02467, USA)

Charlesworth, W.R. (1994) Evolutionary theory: Ethological and sociobiological aspects. In: T. Husen & T.N. Postlethwaite (Eds.) *International Encyclopedia of Education*. 2nd. Ed. 4, 2167-2172, New York: Pergamon Press (P.O. Box 18, Stockholm, WI 54769, USA)

Charlesworth, W.R. (1995) An evolutionary approach to learning, cognition, and development. In: C.A. Nelson (Ed.) *Basic and Applied Perspectives on Learning, Cognition, and Development*. 175-217, Mahwah NJ: Erlbaum (see above)

Charlesworth, W.R. (1995) Children in cities: An ethological/sociobiological approach. In: D. Gorlitz et al. (Eds.) *Children, Cities, and Psychological Theories: Developing Relationships*. 477-503, 512-513, New York: de Gruyter (see above)

Charlesworth, W.R. (1996) Cooperation as competition: Contributions to a developmental and evolutionary model. *International Journal*

of Developmental Psychology, 19, 1, 25-39 (see above)

Charlesworth, W.R. (1998) Review of *Metaphysics and the Origin of Species* by M. Ghiselin. *Human Development*, 41, 372-376 (see above)

Coney, N.C. & Mackey, W.C. (1999) The feminization of domestic violence in America: The woozle effect goes beyond rhetoric. *Journal of Men's Studies*, 8, 1, 45-58 (W.C. Mackey: Townshire Manor, Apt. #6, 401 Lake Street, Bryan, TX 77801, USA)

Corwyn, R.F. & Bradley, R.H. (1999) Determinants of paternal and maternal investment in children. *Infant Mental Health Journal*, 20, 3, 238-256 (Bradley, R.H.: Univ. Arkansas, Ctr. Res. Teaching & Learning, 2801 S Univ Ave, Little Rock, AR 72204, USA)

Cosmides, L. & Tooby, J. (1999) Toward an evolutionary taxonomy of treatable conditions. *Journal of Abnormal Psychology*, 108, 3, 453-464 (Tooby, J.: Univ. Calif. Santa Barbara, Dept. Anthropol., Santa Barbara, CA 93106, USA)

De Weerth, C., van Geert, P. & Hoijtink, H. (1999) Intraindividual variability in infant behavior. *Developmental Psychology*, 35, 4, 1102-1112 (Van Geert, P.: Univ. Groningen, Heymans Inst., Grote Kruisstr 2-1, NL-9712 TS Groningen, Netherlands)

Demetriou, A. & Raftopoulos, A. (1999) Modeling the developing mind: From structure to change. *Developmental Review*, 19, 3, 319-368 (Univ. Cyprus, Dept. Educ. Sci., POB 537, CY-1678 Nicosia, Cyprus)

Depue, R.A. & Collins, P.F. (1999) Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22, 3, 491-517, 555-569 (Cornell Univ., Dept. Human Dev., Ithaca, NY 14853, USA)

Dubrow, L.V. & Howe, N. (1999) Parental play styles and sibling interaction during a problem-solving task. *Infant and Child Development*, 8, 2, 101-115 (Howe, N.: Concordia Univ., Dept. Educ., 1455 Maisonneuve W, Montreal, PQ H3G 1M8, Canada)

Dunn, J. & Cutting, A.L. (1999) Understanding others, and individual differences in friendship interactions in young children. *Social Development*, 8, 2, 201-219 (Inst. Psychiat., Social Genet. & Dev. Psychiat. Res. Ctr., De Crespigny Pk., Denmark Hill, London SE5 8AF, England)

Ellis, B.J., McFadyen-Ketchum, S., Dodge, K.A., Pettit, G.S. & Bates, J.E. (1999) Quality of early family relationships and individual differences in the timing of pubertal maturation in girls: A longitudinal test of an evolutionary model. *Journal of Personality and Social Psychology*, 77, 2, 387-401 (Univ. Canterbury, Dept. Psychol., Private Bag 4800, Christchurch 1, New Zealand)

Evans, D.W., Gray, F.L. & Leckman, J.F. (1999) The rituals, fears and phobias of young children: Insights from development, psychopathology and neurobiology. *Child Psychiatry and Human Development*, 29, 4, 261-276 (Bucknell Univ., Dept. Psychol., Lewisburg, PA 17837, USA)

Feeney, J.A. (1999) Adult attachment, emotional control, and marital satisfaction. *Personal Relationships*, 6, 2, 169-185 (Univ. Queensland, Dept. Psychol., St Lucia, Qld 4072, Australia)

Feldman, R., Weller, A., Leckman, J.F., Kuint, J. & Eidelman, A.I. (1999) The nature of the mother's tie to her infant: Maternal bonding under conditions of proximity, separation, and potential loss. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40, 6, 929-939 (Bar Ilan Univ., Dept. Psychol., IL-52900 Ramat Gan, Israel)

Freese, J. & Powell, B. (1999) Sociobiology, status, and parental investment in sons and daughters: Testing the Trivers-Willard hypothesis. *American Journal of Sociology*, 104, 6, 1704-1743 (Indiana Univ., Dept. Sociol., 744 Ballantine Hall, Bloomington, IN 47405, USA)

Gaertner, L. & Foshee, V. (1999) Commitment and the perpetration of relationship violence. *Personal Relationships*, 6, 2, 227-239 (Univ. N

Carolina, Dept. Psychol., CB 3270, Chapel Hill, NC 27599, USA)

Ghazanfar, A.A. & Hauser, M.D. (1999) The neuroethology of primate vocal communication: substrates for the evolution of speech. *Trends in Cognitive Sciences*, 3, 10, 377-384 (Harvard Univ., Dept. Psychol., 33 Kirkland St, Cambridge, MA 02138, USA)

Goldsmith, H.H., Lemery, K.S., Buss, K.A. & Campos, J.J. (1999) Genetic analyses of focal aspects of infant temperament. *Developmental Psychology*, 35, 4, 972-985 (Univ. Wisconsin, Dept. Psychol., 1202 W Johnson St, Madison, WI 53706, USA)

Grych, J.H. & Clark, R. (1999) Maternal employment and development of the father-infant relationship in the first year. *Developmental Psychology.*, 35, 4, 893-903 (Marquette Univ., Dept. Psychol., POB 1881, Milwaukee, WI 53201, USA)

Gutierres, S.E., Kenrick, D.T. & Partch, J.J. (1999) Beauty, dominance, and the mating game: Contrast effects in self-assessment reflect gender differences in mate selection. *Personality and Social Psychology Bulletin*, 25, 9, 1126-1134 (Arizona State Univ. W, Dept. Social & Behav. Sci., POB 37100, 4701 W Thunderbird Rd, Phoenix, AZ 85069, USA)

Hattori, K. (1999) Two origins of language evolution: Unilateral gestural language and bilateral vocal language, hypotheses from IQ test data. *Mankind Quarterly*, 39, 4, 399-436 (Natl. Rehabil. Ctr. Disabled, 4-1 Namiki, Tokorozawa, Saitama 3590042, Japan)

Herlitz, A., Airaksinen, E. & Nordstrom, E. (1999) Sex differences in episodic memory: The impact of verbaland visuospatial ability. *Neuropsych*, 13, 4, 590-597 (Univ. Stockholm, Dept. Psychol., S-10691 Stockholm, Sweden)

Holigrocki, R.J., Kaminski, P.L. & Frieswyk, S.H. Introduction to the parent-child interaction assessment. *Bulletin of the Menninger Clinic*, 63, 3, 413-428 (Menninger Clin., Karl Menninger Sch. Psychiat. & Mental Hlth. Sci., Box 829, Topeka, KS 66601, USA)

Howell, F.C. (1999) Paleo-demes, species clades, and extinctions in the pleistocene hominin record. *Journal of Anthropological Research*, 55, 2, 191-243 (Univ. Calif. Berkeley, Museum Vertebrate Zool., Berkeley, CA 94720, USA)

Hughes, C., Deater-Deckard, K. & Cutting, A.L. (1999) 'Speak roughly to your little boy'? Sex differences in the relations between parenting and preschoolers' understanding of mind. *Social Development*, 8, 2, 143-160 (Inst. Psychiat., MRC, De Crespigny Pk., London SE5 8AF, England)

Jackendoff, R. (1999) Possible stages in the evolution of the language capacity. *Trends in Cognitive Sciences*, 3, 7, 272-279 (Brandeis Univ., Volen Ctr Complex Syst., Waltham, MA 02454, USA)

Kagan, J., Snidman, N., Zentner, M. & Peterson, E. (1999) Infant temperament and anxious symptoms in school age children. *Development and Psychopathology*, 11, 2, 209-224 (Harvard Univ., Dept. Psychol., 33 Kirkland St., Cambridge, MA 02138, USA)

Keltner, D. & Gross, J.J. (1999) Functional accounts of emotions. *Cognition and Emotion*, 13, 5, 467-480 (Univ. Calif. Berkeley, Dept. Psychol., 3210 Tolman Hall, Berkeley, CA 94720, USA)

Killgore, W.D.S. & Gangestad, S.W. (1999) Sex differences in asymmetrically perceiving the intensity of facial expressions. *Perceptual and Motor Skills*, 89, 1, 311-314 (Univ. Penn., Med. Ctr., 3rd Floor Gates Bldg, Philadelphia, PA 19104, USA)

Legrand, L.N., McGue, M. & Iacono, W.G. (1999) A twin study of state and trait anxiety in childhood and adolescence. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40, 6, 953-958 (Univ. Minnesota, Dept. Psychol., 75 E River Rd, Minneapolis, MN 55455, USA)

Levine, S.C., Huttenlocher, J., Taylor, A. & Langrock, A. (1999) Early sex differences in spatial skill. *Developmental Psychology*, 35, 4, 940-949 (Univ. Chicago, Dept. Psychol., 5848 S Univ. Ave., Chicago, IL 60637, USA)

Lilienfeld, S.O. & Marino, L. (1999) Essentialism revisited: Evolutionary theory and the concept of mental disorder. *Journal of Abnormal Psychology*, 108, 3, 400-411 (Emory Univ., Dept. Psychol., Room 206, Atlanta, GA 30322, USA)

Locke, J.L. & Hauser, M.D. (1999) Sex and status effects on primate volubility: Clues to the origin of vocal languages? *Evolution and Human Behavior*, 20, 3, 151-158 (Univ. Sheffield, Dept. Human Commun. Sci., 18 Claremont Crescent, Sheffield S10 2TA, S Yorkshire, England)

Lowinger, S. (1999) Infant irritability and early mother-infant reciprocity patterns. *Infant and Child Development*, 8, 2, 71-84 (Bar Ilan Univ., Dept. Educ., IL-52900 Ramat Gan, Israel)

Mikach, S.M. & Bailey, J.M. (1999) What distinguishes women with unusually high numbers of sex partners? *Evolution and Human Behavior*, 20, 3, 141-150 (Bailey, J.M.: Northwestern Univ., Dept. Psychol., Evanston, IL 60208, USA)

Morehead, D. (1999) Oedipus, Darwin, and Freud: One big, happy family? *Psychoanalytic Quarterly*, 68, 3, 347-375 (Menninger Clin., Box 0829, 5800 S W 6th, Topeka, KS 66601, USA)

Morrongiello, B.A. & Dawber, T. (1999) Parental influences on toddlers' injury-risk behaviors: Are sons and daughters socialized differently? *Journal of Applied Developmental Psychology*, 20, 2, 227-251 (Univ. Guelph, Dept. Psychol., Guelph, ON N1G 2W1, Canada)

Murray, L., Woolgar, M., Briers, S. & Hipwell, A. (1999) Children's social representations in dolls' house play and theory of mind tasks, and their relation to family adversity and child disturbance. *Social Development*, 8, 2, 179-200 (Univ. Reading, Dept. Psychol., 3 Earley Gate, Whiteknights, POB 238, Reading RG6 6AL, Berks, England)

Nishida, T., Kano, T., Goodall, J., McGrew, W.C. & Nakamura, M. (1999) Ethogram and ethnography of Mahale chimpanzees. *Anthropological Science*, 107, 2, 141-188 (Kyoto Univ., Fac. Sci., Kitashirakawa Oiwakecho, Kyoto, Japan)

O'Connor, T.G. & Hirsch, N. (1999) Intra-individual differences and relationship -specificity of mentalising in early adolescence. *Social Development*, 8, 2, 256-274 (Inst. Psychiat., Social Genet. & Dev. Psychiat. Res. Ctr., 111 Denmark Hill, London SE5 8AF, England)

Ollendick, T.H. & King, N.J. (1999) Child behavioral assessment and cognitive-behavioral interventions in schools. *Psychology in the Schools*, 36, 5, 427-436 (Virginia Polytech Inst. & State Univ., Dept. Psychol., Blacksburg, VA 24061, USA)

Pawlowski, B. (1999) Permanent breasts as a side effect of subcutaneous fat tissue increase in human evolution. *Homo*, 50, 2, 149-162 (Univ. Wroclaw, Dept. Anthropol., Ul Kuznicza 35, PL-50138 Wroclaw, Poland)

Rochat, P., Querido, J.G. & Striano, T. (1999) Emerging sensitivity to the timing and structure of protoconversation in early infancy. *Developmental Psychology*, 35, 4, 950-957 (Emory Univ., Dept. Psychol., Atlanta, GA 30322, USA)

Senior, C., Barnes, J., Jenkins, R., Landau, S., Phillips, M.L. & David, A.S. (1999) Attribution of social dominance and maleness to schematic faces. *Social Behavior and Personality*, 27, 4, 331-337 (Inst. Psychiat., 103 Denmark Hill, London SE5 8AZ, England)

Simonton, D.K. (1999) Talent and its development: An emergenic and epigenetic model. *Psychological Review*, 106, 3, 435-457 (Univ. Calif. Davis, Dept. Psychol., 1 Shields Ave, Davis, CA 95616, USA)

Spiro, M.E. (1999) Anthropology and human nature. *Ethos*, 27, 1, 7-14 (Univ. Calif. San Diego, San Diego, CA 92103, USA)

Stamps, J.A. & Krishnan, V.V. (1999) A learning-based model of territory establishment. *Quarterly Review of Biology*, 74, 3, 291-318 (Univ. Calif. Davis, Sect. Evolut. & Ecol., Davis, CA 95616, USA)

Steele, H., Steele, M., Croft, C. & Fonagy, P. (1999) Infant-mother attachment at one year predicts children's understanding of mixed emotions at six years. *Social Development*, 8, 2, 161-178 (Univ. Coll. London, Sub Dept. Clin. Hlth. Psychol., Gower St., London WC1E 6BT, England)

Thornhill, R. & Gangestad, S.W. (1999) The scent of symmetry: A human sex pheromone that signals fitness? *Evolution and Human Behavior*, 20, 3, 175-201 (Univ. New Mexico, Dept. Biol., Albuquerque, NM 87131, USA)

Van IJzendoorn, M.H., Schuengel, C. & Bakermans-Kranenburg, M.J.T. (1999) Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11, 2, 225-249 (Leiden Univ., Ctr. Family & Child Studies, POB 9555, NL-2300 RB Leiden, Netherlands)

Wakefield, J.C. (1999) Evolutionary versus prototype analyses of the concept of disorder. *Journal of Abnormal Psychology*, 108, 3, 374-399 (309 W 104th St, Apartment 9C, New York, NY 10025, USA)

Young, S.K., Fox, N.A. & Zahn-Waxler, C. (1999) The relations between temperament and empathy in 2-year-olds. *Developmental Psychology*, 35, 5, 1189-1197 (Fox, N.A.: Univ. Maryland, Inst. Child Study, College Pk, MD 20742, USA)

Young, S.N. & Palmour, R.M. (1999) Research on genes: promises and limitations. *Journal of Psychiatry and Neuroscience*, 24, 4, 300-303 (McGill Univ., Dept. Psychiat., 1033 Pine Ave W, Montreal, PQ H3A 1A1, Canada)

Darwin Awards

A true high point of the e-mail year has arrived. Yes, it is the 1999 Darwin Awards. For those sheltered few of you who are not fully aware of the Darwin Awards; these awards are given annually (and posthumously) to those individuals who did the most for the human gene pool by removing themselves from it.

GRAVITY KILLS

A 22-year-old Reston man was found dead yesterday after he tried to use 'occy' straps (the stretchy little ropes with hooks on each end) to bungee jump off a 70-foot railroad trestle, police said. Fairfax County police said Eric A. Barcia, a fast-food worker, taped a bunch of these straps together, wrapped an end around one foot, anchored the other end to the trestle at Lake Accotink Park, jumped... and hit the pavement. Warren Carmichael, a police spokesman, said investigators think Barcia was alone because his car was found nearby. "The length of the cord that he had assembled was greater than the distance between the trestle and the ground," Carmichael said. Police say the apparent cause of death was "major trauma." An autopsy is scheduled for later in the week.

CATCH!

A man in Alabama died from rattlesnake bites. Big deal you may say, but there's a twist here that makes him a candidate. It seems he and a friend were playing catch with a rattlesnake. You can guess what happened from here. The friend (a future Darwin Awards candidate) was hospitalized.

Happy Holidays and a productive New Millenium!

INTERNATIONAL SOCIETY FOR HUMAN ETHOLOGY

Membership and Bulletin

The International Society for Human Ethology aims at promoting ethological perspectives in the scientific study of humans worldwide. It encourages empirical research in all fields of human behavior using the full range of methods developed in biology and the human behavioral sciences and operating within the conceptual framework provided by evolutionary theory. Founded in 1972, the Society fosters the exchange of knowledge and opinions concerning human ethology with all the other empirical sciences of human behavior. A not-for-profit scientific society, ISHE administers its funds to support this purpose.

YES, I WANT TO BECOME A MEMBER OF **ISHE** FOR THE CURRENT CALENDAR YEAR.

Name_____

Address_____

_____

_____

E-mail_____ Telephone_____ Fax_____

New membership or renewal? New_____ Renewal_____ Start Membership in 19____

Annual dues (tax-deductible in the US) are $US 25 per year or (preferably) $60 for three years ($10/yr. or $25/3 yrs. for students or professors emeriti/-ae). Membership includes the quarterly *Human Ethology Bulletin* and the current Membership Directory.

Please pay by check in US funds made out to ISHE or by credit card (VISA or Mastercard or Eurocard). Please send payment to the Treasurer, Prof. Barbara Fuller, University of Colorado, School of Nursing, 4200 E. 9th Ave., Denver, CO 80262 USA, fax 1-303-315-5666, e-mail barbara.fuller@uchsc.edu. If you must pay by foreign check, please add $10.

Type of credit card_____ Credit card number_____ _____

Expiration date_____Amount of payment_____ ____Signature_____