Commensal

The Newsletter of the Philosophical Discussion Group

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10th December 2000 **Theo Todman**

EDITORIAL

As I write this I'm about to start the last week of my first term at Birkbeck College, London University. In general, I've managed to downsize my day job to the standard 40-hour week, though some weeks have been very busy, and the railway "go slow" is highly irritating in certain circumstances - mainly when I can't get a seat. The course is interesting, though the Logic course is rather trivial. Greek Ethics is something I've not touched before, beyond reading Aristotle's Ethics many years ago. We have a course on Philosophical Problems, with one lecture and a "small groups" session each week. We are supposed to take it in turns to present a paper, but I've done three of the seven presentations this term - once because it was my turn and twice in default of others - and have been prepared to present all of them. Anthony Grayling - he of "The Last Word" in Saturdays' *Guardian*, and author of many philosophical tomes, is the PP lecturer and leader of my small group, which make the sessions interesting (for me, at least). In addition, I've set up the Birkbeck equivalent of PDGList. Finally, we've had our first "away weekend" at Cumberland Lodge in Windsor Great Park. So, things are looking good - though I've not had my papers marked yet, so maybe I'll be utterly deflated when they are ! This eventuality aside, I'd heartily recommend the course to anyone else within range of central London.

The temporary dearth of new members seems to have abated to some extent. So, a very special welcome to :-

Keith Morris	Jay Marcham
John Puttick	Clive Savage
Reena Patel	David Brown

PDG Gathering 2001

As announced last time, next year's *Gathering* is being organised by Roger Farnworth and myself. It will be on the subject of *Consciousness* and will be held at Braziers Park over the weekend of Friday May 4th - Sunday May 6th 2001, so please reserve these dates in your diaries.

Here's the draft programme of events. There are still some gaps, so if you want to speak - and I hope you will - please let me or Roger (on 01208 821 544) know as soon as possible. If there are more people wanting to speak than we have places, we'll se whether we can squash the programme up a bit to make room (or I can give up my slot if needs be).

In particular, we want to get the weekend off to a good start - so, we need both a suitable "hot topic" on the subject of consciousness and a couple of intrepid debaters to take on the subject. I've suggested one in default of a better idea - Is a Consciousness Computer Possible ? - and am willing to argue either side of this debate. I look forward to a full post-bag of suggestions !

Friday	**4th May 2001**
17:00 – 18:30	Arrive
18:30	Supper
20:00	Introduction "in the round"; review plans for the weekend
20:30	Introductory debate: (Eg.) *Is a Consciousness Computer Possible ?*

Saturday	**5th May 2001**
08:30	Breakfast
09:45	Talk & Discussion: *Consciousness - a Survey of the Problem* (Theo Todman)
11:15	Coffee
11:30	Talk & Discussion: *Consciousness and Complexity in the Coming Century* (Peter Lagersted)
13:00	Lunch
Afternoon	Free
16:15	Tea
16:30	Round Table Discussions : (Chair : Roger Farnworth)
17:30	Talk & Discussion: Volunteer Required !
18:30	Supper
20:00	Philosophical Cafe (at Braziers) – bring a bottle !

Sunday	**6th May 2001**
08:30	Breakfast
09:45	Talk and Discussion: *The Phenomenological Approach to Mental Illness and its Implications for the Mind/Body Problem* (Peter McCarthy)
11:15	Coffee
11:30 – 12:45	Talk and Discussion: Volunteer Required !
13:00	Lunch
14:00	Planning next year's Conference
14:30	Departure

Notes	
1.	The programme makes provision for plenty of spare time for informal discussion at meals or in the lounge.
2.	Roger Farnworth will arrive at 17:00 on the Friday and meet all guests as they arrive & show them to their rooms.
3.	At Friday's introductory session we will encourage flexibility throughout, and seek to have each session chaired by a different volunteer if that's deemed to be a good idea (otherwise Roger & I will share the job).

PDG Conference Administrative Details

The conference is to be held at Braziers College, Ipsden, Wallingford, Oxon., OX10 6AN, over Friday – Sunday, 4th-6th May 2001.

Braziers College was founded in 1950 as the Braziers School of Integrated Social Research to study practical ways of living in a group. It now operates partly as a community and partly as an adult education college. It has a country-house atmosphere, and is situated in its own attractive grounds in the Chiltern countryside.

The all-inclusive fee, ie. including accommodation and meals, is £95, and early booking is advisable - the deposit is £20. For the fiscally challenged, or those who don't wish to attend for the whole weekend, other options are available. Camping is a snip at £5 / night inclusive of breakfast (but you have to bring your own tent). Saturday attendance is £5 with meals extra. Meals are £7.50 each for mid-day & evening.

Apply for further details to the College at the above address (Tel/Fax: 01491 680221, or on email at admin@braziers.org.uk). Please book directly with the College – I will keep in touch with them periodically to see how things are going. Partners, whether Mensans or not, are welcome.

PDGList

This is the internet discussion group of PDG and invited guests. The list seems very active at the moment, with 45 members. If you don't want to be inundated with emails you can sign up as a "daily digest" member or a "web only member"; the latter option allows you to browse past emails on the web without them clogging up your inbox.

To join PDGList you need first of all to log on to http://www.egroups.com and sign up to eGroups. Then you need to apply to join PDGList itself. You can do this by initially doing a search on "pdglist" and then following instructions. Alternatively, and quicker (though you will thereby miss out on all the wonders of eGroups !), you can go directly to http://www.egroups.com/group/pdglist – again, you will need to join eGroups first (it will prompt you) – and then click on the "subscribe" link or button. Either way, I then need to accept your application. Once accepted, whenever anyone posts anything to the list, you will automatically receive an emailed copy of the posting (subject to the alternatives above). To post something yourself, just email to pdglist@egroups.com and everyone on the list will receive a copy.

Why not give it a go ?

Incidentally, for those who've signed up for PDGList, MS Word 97 versions of all the back-issues of Commensal since I've been PDG Secretary are available in the "Files" area at the PDGList website (http://www.egroups.com/group/pdglist).

PHILOSOPHY FOR ALL – PFA[1]

Kant's Cave : On every first Wednesday of the month, from 7pm (lecture at 7.30 pm) PHILOSOPHY FOR ALL meets at "**Kant's Cave**" for a lecture, debate and social evening. Kant's Cave meetings are now held at the **cellar bar** of The Penderel's Oak, 283-288 High Holborn, London (3 minutes' walk from Holborn tube station). Door-charge: £1 (free for PFA members)

UPCOMING KANT'S CAVE LECTURES

3 Jan 2001	Pradeep Jeyarantam & Mark Leech : The Philosophical Implications of a Chair.
7 Feb 2001	Dr. Eric Frankel and Dr. Stephen Szanto (Whipps Hospital London) : Brainwashed Youth - A Neuroscientific and Philosophical Appraisal

The PFA at the Mary Ward Centre : **Philosophy Debates** are to be held approx. monthly on Saturdays 14:00 - 17:00; Dates : 17 February, 3 March, 7 April, 19 May, 2 June, 9 June. There are also **Public Lectures** on some Saturdays 10:00 - 13:00; Dates : 7 April. The Mary Ward Centre is at 42 Queen Square, London WC1N 3AQ. There is no fee.

ROYAL INSTITUTE OF PHILOSOPHY[2]

Annual Lecture Series, 2000-2001 : Logic, Thought and Language

2001		
5 January	Christopher Peacocke	*Principles for Possibilia*
12 January	A W Moore	*What Are These Familiar Words Doing Here?*
26 January	M. G. F. Martin	*Particular Thoughts and Singular Thought*
9 February	Scott Sturgeon	*The Conditionality of Thought*
16 February	Timothy Williamson	*Possible Beings*
23 February	S. G. Williams	*Ambiguity*
2 March	Bob Hale	*Logical Knowledge*
9 March	Charles Travis	*Rethinking Psychologism*

All Lectures to be given at 14 Gordon Square, London WC1 on Fridays at 5.45 pm. Admission is free.

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[1] See C100 (or http://www.pfalondon.freeserve.co.uk) for more details on PFA. It has no relationship with PDG or British Mensa.

[2] No connection to PDG or Mensa, but I can very highly recommend these lectures.

PDG Web Page

My web-site, now moved to http://website.lineone.net/~theotodman/) and has had rather a lot more gubbins crammed onto it over the last month, I've now set up the PDG web page at :-

http://website.lineone.net/~theotodman/ pdg.htm

The site now contains most of the back-issues of *Commensal*, produced since I became SIG-secretary. The advantage of the HTML versions is that they allow you to hop around between articles (useful for understanding the mixed-bag commentaries on previous issues).

Hopefully, we'll soon get the links set up from the Mensa Web page, which should help advertise the SIG … we seem to be awaiting someone to volunteer to do the rather tedious job of maintaining the Mensa Web page.

This raises the issue of privacy - we've mentioned this idea for some time, and I pointed out the fact that the site is open to anyone who knows the URL. Currently, not many do but eventually it'll become more widely known. I've probably adopted a rather cavalier approach in just bunging the back issues up there, and it may be that some people don't like the idea of people outside the group reading what they've written (no that this can be prevented - anyone in *Mensa* can ask for a newsletter). However, if you are sensitive about this issue, please let me know. I can either place your articles on the PDGList web-site (where only PDGList members can access them) or I can omit them altogether. I'd prefer this not to be requested frivolously as it involves me in extra work - but either is technically possible without too much bother, so if you are concerned, do let me know. **In the future, I will assume that any article submitted for publication in *Commensal* is OK for placing on the web-site, unless you tell me otherwise.**

Editorial Policy

A few members have raised with me the question of what they consider to be excessively long articles appearing in *Commensal*. The reason this occurs is because enthusiastic members are willing to fill up what would otherwise be empty space. My policy on-going will be that articles, other than in exceptional circumstances, must be restricted to 4 pages. This does mean that more of you will need to write in (and I'm still awaiting the volunteer to write summaries of the interesting PDGList debates). I want the newsletter to be a hot-bed of debate, not full of set-pieces with authors receiving little feedback.

Given my commitments at the moment, my preference is for contributions to be emailed or sent on floppy disk. Otherwise they should be neatly typed and printed using a good ribbon so that I can scan them in. I understand that the SIGs Admin Team at Mensa head office has been volunteered to do typing for those who cannot do it themselves, so don't be put off from contributing on this score.

Finally, I've given up all hope of being able to comment on articles during term-time so apologies to those (including Roger Farnworth, yet again) who were hoping for me to do so. I hope to do so in the "holidays", but no promises.

Next Issue of *Commensal*

The next edition of *Commensal* (**C105**) will appear in February. The closing date will be 15th January 2001. The reminder date appears on the bottom of each page.

Best wishes, Happy Christmas, Happy New Year & all that !

Theo

15th October 2000 **Jane Benn**

THE AIMS OF EDUCATION

Mensa At Braziers, 6-8 October 2000
A View from the Chair

After the general introductions, we started the weekend with each of us contributing a definition of what we individually believed to be the main aims of education. The definitions were as follows:-

- Until recently, evolution has not been directed and "best" has not been defined; therefore, the main aim of education is to enable us to direct evolution in the "best" direction (Alan Hassell)
- To reveal to people that there is a lot more that they do not know (Pam Ford)
- One's education refers to that part of one's existence during which one is under the influence of adults - when, in principle, one is being prepared for life (Leslie Haddow)
- Education is the ongoing acquisition of skills and knowledge to equip one for life (Sheila Haddow)
- Education is not just vocational training to earn a living, but lasts until one's dying day to assist in the fulfilment of one's life (Maurice Roth)
- Education is what is left after you have forgotten everything you learnt at school (Alan Edmonds)
- Education is for the imparting and accumulation of knowledge (Jenny Turner)
- Education is :-
    a) to be well-informed and aware
    b) to be able to earn a living
    c) to develop one's full potential as a human being (Hazel Guest)
- The aim of education is to allow each individual to function to the best of his or her ability (Jane Benn)
- Education aims to develop the individual and social potential of all people (plucked from a paper submitted by Alan Mayne).

Perhaps because many of these definitions share some striking similarities, we did not revisit them at the end of the weekend to decide whether we could come up with an all-encompassing definition. Another reason we did not do this may have been because in practice the weekend turned out to be as much about the "how" of education as the "why" which, at least to me, the title implies. This is not to denigrate any of the contributions offered - as usual we had an impressive variety of well-researched ideas to consider and debate, sometimes with considerable vigour. I am not going to attempt to summarise each paper, but what follows is my interpretation of the main elements of the discussions they prompted.

The first main talk of the weekend was given by Alan Edmonds who raised several questions about the quality of school education in the UK and drew our attention to the situation in other European countries. We were somewhat hampered in our discussions by not having anyone amongst us with first-hand knowledge of teaching

small children, but at first blush there appeared to be a general impression that all was not well. On closer examination, however, the view seemed to be emerging that education had improved steadily over time and was continuing to do so. I personally came away with very mixed messages from this session, and I remain unsure about our overall conclusions.

Alan Hassell gave the next talk and took us through his ideas about what an individual should know at various stages of his life. By and large, those present seemed reluctant to accept Alan's lists of requirements on their own (although some new subjects were proposed for inclusion), but thought they should be modified to include those skills (eg sensitivity, ability to think rationally and to judge the quality of information) which are necessary to make a well-rounded individual. It was also felt that the paper concentrated too much on "the top 2%" and failed to recognise that it is quite possible to live a satisfying and worthwhile life without being exceptional. In the general discussion on what an individual should know at any one time, a point that struck me quite forcibly was the need to be able to distinguish between facts and value judgements when imparting education - not easy when we all (including teachers) have our own beliefs and convictions. Peter Elkan pointed out[3] that you cannot derive value from facts.

Our next talk was from Leslie Haddow who followed up some of the themes arising from Alan Hassell's paper and considered the direction which education was now taking and its current aims. The need to motivate children to learn gave rise to much discussion, and the various influences which helped or hindered in this endeavour were debated. The role of the Internet was considered and seemed to get a thumbs-up in that it made children interested in learning and increased their self-motivation by allowing them to be more independent when seeking information. (The question of *the quality* of the information they might receive was considered in a later session.) One general conclusion from this session was that a mix of people should be responsible for educating our children, and the importance of the role of parents, particularly in early life, was emphasised. The demise of health visitors and others giving support to young mothers was lamented. We also considered why the UK was different from the rest of Europe in its attitude to education (following one of Alan Edmonds' themes), but could find no obvious explanation. Whatever the reasons, the general consensus was that UK society was no worse than any other.

The next offering was a talk by myself on personality types and learning styles, put together rather hurriedly to fill a gap in the programme. The conclusions reached were that a variety of teaching methods are necessary if all children are going to be equally well served by the education system, and if all of them are to benefit to the maximum of their abilities (in whatever fields these may lie). Most people at the weekend appeared to be intrigued by the ideas expressed even if not necessarily agreeing with the conclusions reached. But I am always mildly surprised by the strong emotions and negative reactions that can be raised by the suggestion that

[3] Peter should have pointed out that (and maybe he did) that the dominant school of western analytic philosophy alleges that values cannot be derived from facts. Not all philosophers accept this, however (see the "is/ought" controversy in previous issues of *Commensal* !).

people's preferences can be used to create meaningful personality profiles which in turn can be genuinely useful in the classroom and elsewhere.[4]

This was followed by a brief talk from Sheila Haddow on motivation. She took us through the various stages of life, outlining the factors which are likely to influence us to learn as we grow and mature. These started from the need to learn how to survive, and progressed through the wish to be independent, the influence of teachers, challenge and fulfilment, the need to earn more money to meet one's responsibilities, extending the horizons of pleasure, to the need to do something to avoid becoming a self-centred bore in old age! Given that most of us present were at or near the later parts of this chronology, it is perhaps not surprising that there was some lively discussion on post-work options. The need to question one's motives, especially when engaged in activities designed to help others (eg learning to be a counsellor) was considered important.

The last talk on the weekend's main topic came from Jenny Turner who outlined the pros and cons of books, CD-Roms and the Internet as learning tools. As was only to be expected, degrees of enthusiasm for the different media varied amongst those present, but everyone seemed to recognise the benefits of a mixture of all three. Leslie made the point that the Internet was good for information, but not so good for knowledge. Whatever its merits or demerits, it is clearly here to stay and will continue to develop; in fact the use of computers (CD-Roms or Internet) and humans in interaction could have considerable potential when dealing with the problem of over-large classes. And harking back to personality types, the use of interactive CD-Roms could go some way towards motivating those children who do not find traditional teaching methods helpful.

This discussion about the new technologies available proved a useful precursor to Pam Ford's talk on proposals to bring more intellectual content into Mensa's activities. Pam is a member of the British Mensa Committee and convener of the Intellectual Lectures Working Party. We were privileged to have a first-hand account of the proposals, which at this stage are concerned with the possibility of recording and videoing lectures and debates round the country. The results could be distributed at minimal cost to members, and might do something towards injecting some intellectualism into the Mensa web site, where it is currently sadly missing. Pam's efforts were certainly applauded, but there remained the nagging doubt in many people's minds that the audience would not be there. Most Mensa members seem resolutely determined not to go to any meeting that smacks of intellectualism, although some of those leaving Mensa gave the lack of such activities as a reason for their going. At this stage in the discussion it was suggested that if people cannot find what they want in Mensa, they should be encouraged to hold meetings of their own - if only to invite local members round for a cup of coffee. Hazel Guest made the point that she attended meetings in order to enjoy the company of like minds, and that the subject matter was of little importance. I feel that this is a fitting note on which to end

[4] Enough people found these ideas sufficiently interesting to agree that our next autumn meeting at Braziers should be on Personality Profiling. The dates to put in your diary are 28-30 September 2001.

this survey - we did not reach any particular conclusions (although the desirability of having a *mixture* of methods, teachers, influences, etc does seem to have permeated the discussions), but the process of not reaching them was highly enjoyable.

Jane Benn

20th September 2000 **Roger Farnworth**

DETERMINISM AND FREE WILL

It was a great pleasure to read Malcolm Burns response (C102/37) to my article claiming that "all human actions are determined by preceding causes" which as both premise and conclusion is a tautology. Indeed, it would be if the statement were an argument rather than an observation. The observation is that any decision (that is not random) is preceded by motives (which may be conscious or unknowable). It is not possible both to make a choice based on motives and simultaneously choose those motives on which the choice was based. It is not only illogical but in practice impossible to choose to have motives to do what you do not want to do. Try it. You will observe that your strongest coalition of wants will motivate you and determine your course of action. There is no tautology here.

So determinism is an observation of experience on which a theory is based. Both Malcolm and I have never made a choice (except under coercion) that is not the outcome of preferences, wishes, wants, prudence, duty or any other motive. This experience of coming to a conclusion is for both of us "an essential part of what it is to be me, a human being". No one else controls my motives or dictates the conclusion I reach. The difference between us is that Malcolm believes that if he chose to walk on the sunny side he could have walked in the shade despite his motives. Of course, he could have walked on the shady side just to prove me wrong but that would be an additional motive. If he thinks that with the same set of unaltered motives and values he could have concluded differently he is deluded.

He also owes us an explanation of how he could defy his own motives. This task is made more difficult by his claim that with hindsight we could not know what our motives were.

I have had a lifetime of thinking through the determinist position on ethics and the more I perceive the reasons for the difficulties that entangle some people the more compassion I feel for them. In the paper "What is Man for" I show that there is no contradiction whatsoever between determinism and ethics. I want justice for people whether they are, to use your terms, good or bad. In my interest in curbing the arms trade it makes no difference to me whether the person who makes a gun or is killed by a gun is good or bad. What I want is to restrict the suffering caused by the arms trade.

I know that it is difficult to live with a determinist view especially in relationships of affection, trust, resentment and responsibility, but it can be done. As Susan Greenfield said in the final part of her recent series on the brain, we invent the illusion of free will because we cannot psychologically accept that we are determined.

Roger Farnworth

13th November 2000 **Alan Edmonds**

THE RANQUE-HILSCH EFFECT

The Ranque (or better Ranque-Hilsch) effect was discovered more or less by accident by Georges Ranque : G Ranque : "Expériences sur la détente giratoire avec productions simultanées d'un échappement d'air chaud et d'un échappement d'air froid." Journal de Physique et le Radium 4, 1125-1155, 1933 and rediscovered by Hilsch : R Hilsch : Rev Sci Inst 18(2) 108 1947.

A typical R-H device has one input port and two outputs; compressed air at room temperature is fed in and heated air flows from one output and cooled air from the other. It is effectively a refrigerator with (apart from the air streams) no working fluid and no moving parts. Such devices have industrial uses as convenient and localized sources of very cold air and are manufactured by a number of firms, for example C C Steven in California. (www.ccsteven.com/FRAMES/SPOTCOOL.htm).

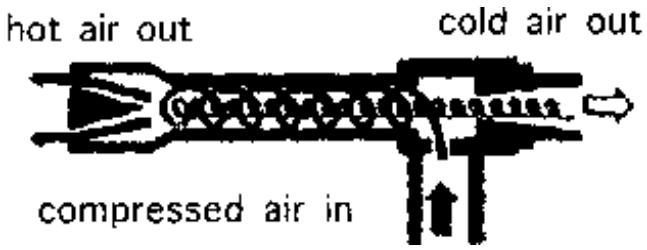
C C Steven's website states :

> "Fluid that rotates about an axis -- like a tornado -- is called a vortex. A vortex tube creates a vortex from compressed air and separates it into two air streams -- one hot and one cold. Compressed air enters a cylindrical generator which is proportionately larger than the hot (long) tube where it causes the air to rotate. Then, the rotating air is forced down the inner walls of the hot tube at speeds reaching 1,000,000 rpm. At the end of the hot tube, a small portion of this air exits through a needle valve as hot air exhaust. The remaining air is forced back through the center of the incoming air stream at a slower speed. The heat in the slower moving air is transferred to the faster moving incoming air. This super-cooled air flows through the center of the generator and exits through the cold air exhaust port."

Remarkably, although the R-H effect has been known for many years it is not yet fully understood. A number of researchers have studied it with so far limited success.

See for example: W. Fröhlingsdorf, H. Unger: Untersuchungen zur kompressiblen Strömung und Energietrennung im Wirbelrohr nach Ranque und Hilsch, Dissertation, Shaker Verlag (ISBN 3-8265-2829-8), Ruhr-Universität Bochum, 1997. Tim

Cockerill : www.cockerill.net (this website carries detailed information about research on the R-H effect).



In recent years the R-H effect (or rather a garbled version of it) has been brought into play to 'explain' alleged shortcomings of astrophysical theory. See Renzo Boscoli in Infinite Energy Magazine (www.mv.com/ipusers/zeropoint/ - a forum for heterodox views on 'Cold Fusion'), Richard Milton ('Is the Sun hot ?') in Mensa Magazine (Nov 1999) and Commensal No 103, and Bob Cooper ('The Ranque Effect - Key to the Mysteries of the Universe ?') also in Commensal No 103.

The R-H effect is exemplified by an ingenious but highly artificial device whose detailed functioning is still only partly understood. I find it difficult, looking at the matter with a background of physics and engineering (plus just common sense) to see how the working of such a device has any relevance to the processes taking place, for example, in the interior of the Sun.

Alan Edmonds

2nd October 2000 **Anthony Owens**

DETERMINISM

In response to Theo's reply in C103 may I say that my comment about the argument to support free will was put in because I could not understand Roger's accusation of 'Nazi' if he had actually read what I'd said. Of course, no argument could ever prove free will but I thought that I had 'supported' the idea.

To claim that there is no essential difference between a (presumed perfect) android and a human being is a perfectly valid position. Theo adds that "humans are born pre-programmed ... to enable them to live in communities ...(and)... to learn moral codes". What I still do not understand is why, under such determined conditions, those who offend community life and moral codes should not be chopped up for dog food. After all, Theo seems to imply that such people are worse than androids; and no-one would think twice about dismantling them if they malfunctioned. Thus I submit that compassion is both illogical and unnecessary in a determined being. Can anyone suggest a mechanism for its evolution?

Anthony Owens

Theo Todman → Anthony Owens (2nd October 2000) : Thanks for your brief reply. As an even briefer response, I think where I would take issue with you is where you say "no-one would think twice about dismantling them (androids) if they malfunctioned". Well, maybe they wouldn't, but they should. Time was when people thought that animals were automata that couldn't feel pain, and treated them accordingly. We can never know for sure that animals do feel pain, but since they act as though they do, and the higher ones have the neurological equipment that looks sophisticated enough to enable them to, it seems the prudent policy to adopt to assume that they do indeed feel pain (just as I presume that you do, or, if I were a Nazi, would have reason to believe that Jews do - haven't we had that one before ?). The point of this is that if we did manage to create an android with sufficiently sophisticated neurological hardware (be it silicon or whatever) that acted as though it had hopes, fears, felt pain etc. then we would be prudent to assume that it did and treat it accordingly. This is along the lines of the Turing test - though I would take the hardware side of things to be important (as does John Searle with his Chinese Room) whereas it's irrelevant in a universal Turing machine. Hence, your reductio fails as far as I can see.

Theo

Anthony Owens → Theo Todman (4th October 2000) : I am glad to say that I am sufficiently not Nazi to treat everything possessing life with great care, evicting wood-lice, beetles, double glazing salesmen and all to the garden, where I trust they will live out their lives, however disgusting they might be, in a completely chemical free environment. I even object to cut flowers; and only trim my hedges under protests from my neighbours.

The trouble is I'm a hypocrite: eating steak pies; pork; and chicken. Indeed, the majority of people have few qualms about dismantling these animals, or at least eating the result, so if that's all we are, where's the problem in turning criminals into dog food?

I'm sure a painless way of dismantling your super automata could be devised; that is if they are ever built. Why not start the world's first Automaton Rights Organisation: just in case?

Tony Owens

Theo Todman → Anthony Owens (5th October 2000) : I almost missed the serious point in the item above, and thought our discussion was over.

You're right - most people don't like to think what they (or their proxies) do to animals - and we are irrationally ambiguous in our approach to pets and non-pets. I suspect our concern is for our feelings rather than theirs.

I think there are two complicating factors. We are partly in symbiosis, partly in competition with other species. We cannot adopt a universal "live and let live" policy - but where we can I think we should. Personally, I avoid gratuitously treading on snails and deliver the occasional gargantuan spider safely to the garden care of my patented catching device (a reconditioned tea-bag box). I'm less emotionally attached to slugs and crane flies - and in any case they don't have the convenient handles, or have bits that drop off, making their rescue more difficult.

My view on animal husbandry is that life in the wild is not a bed of roses, and domesticated species would not exist, certainly in the numbers they do, without human intervention. So, I would say that if an animal's life (albeit one cut short) is for it on balance worth living then that animal's treatment at human hands is justifiable. It has a number of free lunches in order to become lunch itself, so to speak.

More seriously, though, I would think it wrong to eat the highest species that are more self aware, given our opportunity for alternative sources that in any case taste nicer.

The bottom line in all this is that you seem to take a rigorously "speciesist" line, and assume that anyone who doesn't would be committed to treating objectionable humans in as cavalier a fashion as a speciesist would treat animals. I don't see that this is the case at all.

To restate what I perceive to be your argument :-

1. Androids are determined.
2. If we could make a perfect android, and humans are also determined, there would be no reason to prefer a human to an android.
3. Item 2 is a ridiculous state of affairs, so humans aren't determined.
4. In any case, we can dismantle a (perfect) android at will.
5. Hence if humans are determined, we would be able to dismantle humans (or at least bad ones) at will.
6. Item 5 is a bad state of affairs, so humans aren't determined.

As previously argued, I disagree that item 2 is a ridiculous state of affairs and disagree with you on item 4.

I'm still not sure what determinism's got to do with it, because if you are a speciesist, you'd prefer a human to an android even if both were determined, so the fact that you do so prefer humans is no proof that humans be deemed to have free will.

If I've got your argument wrong, could you re-state it in unambiguous form ?

Theo

Anthony Owens → Theo Todman (6th October 2000) : In response to your assessment of my argument above; it is a model of brevity, but I am not trying to prove that humans are not determined, which I believe is impossible. Consequently both items 3 and 6 become irrelevant, and the argument would run :-

1. Androids are determined.
2. If we could make a perfect android, and humans are also determined, there would be no reason to prefer a human to an android.
3. We need have no qualms about dismantling a malfunctioning android.
4. It necessarily follows that if humans are determined we ought to have no qualms about dismantling malfunctioning humans, such as criminals.
5. Those who would deny item 4 are being illogical.
6. Therefore, those who would deny item 4 yet claim that humans are determined are capable of coming to illogical conclusions, and it follows that their opinions are unreliable.

In other words I am inviting an argument against the view that we should chop up criminals for dog food in the hope that it might demonstrate that an argument against determinism in humans is possible. I believe it may demonstrate that humans are either illogical or possess free will. To deny free will must therefore be the product of a mind which is demonstrably illogical.

Tony Owens

Theo Todman → Anthony Owens (8th October 2000) : Thanks for clarifying matters. As previously argued, I would part company with you over (your) item 3 - ie. we would have to treat a perfect android with more respect (so we should chop up for dog-food neither perfect androids nor criminals). Also, you might need to argue more strongly that what sets us apart from androids is just that they are determined and we are (for the sake of argument) not - unless you define android perfection as being "human but determined".

Theo

November 2000 **Roger Farnworth**

WHY SCIENCE DOES NOT TELL THE TRUTH - A REPLY

Why science does not tell the truth - a reply.

In Dr Martin Kusch's "sepo" game the processes of changing the "sepo.array" are presumably not arbitrary, altered at random, as this would be absurd. But what is the rationale of the process of selection based on observation. If it is based on the observation of a certain quality by one or two observers, it is "peko". If it is based on

the observation of qualities by the majority of three or more observers it is sepo . This is to claim very little.

If the "sepo" group of observers changes either its mind or its composition then the potential for absurdity arises. Let A and B be defining qualities such that group A qualities signify a new scientific discovery and B signifies no new discovery. Under "sepo" rules A can change into B in the sepo array.

AAA	AB	ABB
AB	ABB	BB
ABB	BB	BBB
BB	BBB	B

Let us use the example given of a bulldozer turning into a cat. Define each in terms of three qualities, mobile, consumes fuel, noisy. It can readily be seen that if we define a bulldozer as mobile on caterpillar tracks, a petrol guzzler and having a loud motor and a cat as a paw pacer, milk guzzler, caterwauler then the sepo array for earth movers could change to cats very easily removing both usefulness and clarity altogether.

Roger Farnworth

26th September 2000 **Jeremy Jenkins**

SIAMESE TWINS[5]

I thought I would share some thoughts from emails I've sent to other people discussing this topic. Have to say I'm surprised at the number of humanists who are falling into the 'preserve life at all costs' mentality so beloved of the religious. And that although for different reasons, I find myself in agreement with senior RC clerics ... or better phrased, they're agreeing with ME.

.... this case has produced some curious alliances among people who would in other circumstances be mortal enemies. Although the same conclusions are being reached for entirely different reasons The question that has not been asked is what would each of the twins say if they were competent to have the facts explained to them and express an opinion. In my view, the only justification for carrying out an operation of this nature is if we could be confident that both parties would agree to it.

As a humanist, I would like to think that in 'Mary's' position I would allow the operation to go ahead so that 'Jodie' could be saved. But what about 'Jodie's' point of view? The medical complications seem to get worse by the day, in contradiction to the initial indications of the doctors. But even assuming these can be overcome, who would wish to live in the knowledge that someone else - let alone a twin - had died as

[5] This discussion took place on SceptiList, an email discussion group on eGroups analogous to PDGList for members of SceptiSIG.

the price of achieving this. Even if such early death was inevitable, that is a massive emotional burden to carry.

I reckon that this is yet another example of doctors wanting human guinea pigs to experiment on with no thought at all for human feelings. Although my initial reaction was to say they should be separated, the more I think about it, the more convinced I am that the parents in this instance are right. Even if they are right for what I believe are the wrong reasons.

.... As for the twin 'Jodie' under discussion .... it seems to have gone without question in the media generally that it's in her best interests for the operation to go ahead. I wonder how many people would choose to live if the price of that was firstly the murder of your twin, followed by your own dismemberment and being partially patched together with bits and pieces from your dead twin. Then years of reconstructive surgery to follow and a life of almost certain disablement at the end. And that's supposed to be in her 'best interests'?

I'd love to know if any of the Court of Appeal judges would volunteer for the treatment themselves, given the choice. It's a terrible shame that the parents have rested their opposition on their religious views and not on the fact that whatever about the rights of the twin who will die in the process, it's a gross violation of the human rights of the twin who's actually going to be the one to endure this procedure.

Jeremy Jenkins

Patrick O'Donohoe (27th September 2000) : This would seem to me a case where religious views **are** important, since they have a bearing on the future quality of life. It seems the whole community in Malta is deeply religious and, according to one survey quoted by the (I think) the BBC, about 3/4 of the locals support the parents' view. This means Jodie is likely to grow up in a culture which believes she should be dead.

This is obviously just one factor in a very complex situation. On my limited understanding of the situation I also tend to favour the religious "side", but clearly there is no "right" answer. Of course, grey areas like this make a great playing field for black-and-white-ists of all persuasions.

Patrick O'Donohoe

Theo Todman (3rd October 2000) : I'd like substantially to agree with Patrick on this one, though I ultimately take a different side on the issue. Religion is an important factor in the case, but only because of the stupidity of some societies.

Ethically speaking, I'm a consequentialist and believe that actions should be

undertaken primarily based on their consequences, in so far as these can be foreseen. There's always the "do nothing" option, which some would dress up in pietistic language as "leaving it to God". This is sometimes just a cop-out as, theologically speaking, God has presumably given us talents to use, so refusing to use them when they are useful just because it's too risky is just cowardice. No-one is morally forced to rescue a drowning child (in the way you would be morally forced not to drown a swimming child), it would just be cowardly or selfish not to do so if you were the one in a position so to do.

So, we have to determine whether the "do nothing" option leads to worse consequences that the "do something" option. This is a complicated calculation.

I will take it that the bleak prospect of "do nothing" painted for us is correct - ie. heart failure within a few months leading to the death of both twins. This would seem to be a bad state of affairs. Maybe the process of dying isn't that pleasant, either. Maybe it's possible to keep them both alive by implanting an artificial heart into the other one - but as no-one's volunteered this as a solution, I'll presume it's not on.

If we take positive action, we have a certain downside - the death of one twin. We have a likely up-side : a long and relatively healthy life for the other twin.

As Jeremy noted, there are flies in the ointment - the process of achieving the long and healthy life would probably itself be long and painful. It might also end in failure. In itself, this is not much of a counter-argument - curing any serious disease tends to be long and painful, but people go through this partly because the alternative (death) is less appealing ... but also because they also see at least some life worth living beyond the intervening pain. Small babies can't see anything very much, so decisions have to be made on their behalf by those who can. It is routine to try to save the lives of premature babies, however ill they are.

That Siamese twins can be separated and one survive seems to be proved. There was an example in the paper over the weekend (Saturday Times, 30/9 - p. 3) of a Siamese twin - Victoria Tieaskie - who survived just such a separation and 40 other big operations and is just about to get married, aged 30. And jolly grateful she is to, by all accounts.

I'm not sure how Jeremy knows that the surviving twin wouldn't want to have gone through with the operation. It would only be the case if her parents and others she grew up with filled her head with such nonsense as that her twin had been "murdered". Even if this were true, quite how can she be held responsible when she wasn't party to the decision ? This just strikes me as being a loss of nerve. Just how is two people being dead supposed to be better than one person being dead ? The term "murder" isn't designed for use in such circumstances.

Of course, things might go horribly wrong - both babies might die on the operating table, the surviving one might end up with a horrible life (especially if half-wits fill her head with their own moral confusions). And yes, it would be nice if they could both live happily ever after, but they can't. Even if the situation was entirely

symmetrical (though I can't see how it could be the case in this situation) it would still be rational to choose one rather than let both die.

Say two of us are involved in the next Greek sea tragedy and there's only one place on the drift-wood - do we dither around "after you, no, after you, no I couldn't" until we both drown ? Well, that makes no sense - we have to come to a decision procedure as to who lives and who dies, and it's then incumbent on the survivor to make the best of his life and not wallow around in remorse. Come to think of it, wasn't there a film made about this recently ?

Theo Todman

P.S. I suppose I ought to say something about "human rights". These are not natural rights, but are granted by human societies in so far as they can afford them. In this case, we can't "afford" to let both children live - it's just not possible - so it's no use saying they both have a right to life, because no-one can supply that right. However, we can deliver that right to precisely one of them, and it would be a violation of that right not to do so.

Jeremy Jenkins[6] (4th October 2000) : Thanks for your interesting contribution. I think we're all agreed on the principle of this, the difference lies in how we define 'best' and 'worst' options.

Maybe the prospect of dying is unpleasant, but so is the alternative - at least for Jodie. On the other hand, the operation is actually an easy way out for Mary. I think the case would be marginal if the surviving twin actually could look forward to a 'healthy' life - which current reports do not suggest at all. I would still not be able to justify the operation but it would be a harder call than the scenario we have.

I must say I often wonder about this, admittedly without having any direct personal experience of a life-or-death situation. My outlook has always been that if the medicine is worse than the disease, it's best left untaken. It seems to me that many people do take medicine that's worse than the disease they have, and other than not wishing to leave family behind, I cannot figure out any rational motivation for this. But then maybe it's instinctive for most people to do whatever they can to cling onto life without trying to rationalise precisely why they are doing to.

From what I have read about Christopher Reeve, his motivation for remaining alive has been the hope he will one day walk again. I hope he will, but if so I do have to ask whether he will ultimately be able to say that the sacrifice and difficulties were all worth it, compared to letting nature take its course after he got injured.

[6] Jeremy's postings to the list were presented as a repeat of my postings, with interspersed comments. This doesn't conserve space in the newsletter, so I've reformatted Jeremy's thoughts, hopefully not thereby distorting them. Ed.

My opposition to the procedure is based on the premise that if the death of another person was the price of my continued existence, I would like to think (not knowing what I would actually say if push ever came to shove) that I would say no-way-no-how. Even without the prospect of the problems 'Jodie' will face if the operation goes ahead.

Not in all cases do doctors try to save the lives of very ill premature babies. Although decisions like this are normally taken in consultation with the parents. I'm not opposed to separation of Siamese twins on principle, except where it fails the 'medicine worse than the disease' test. I don't know that the surviving twin wouldn't want to have gone through with the operation. But I'm pretty damn sure I wouldn't want to in the same position.

Whether the expression 'murdered' is used or not, the surviving twin is bound to find out one day that she had a twin from whom she was separated, and her twin instantly died on the operating table. What would you say to her if in 15 or 20 years time she said she was born together with her twin and they should have died together? Even if those around her tell her she is not responsible, she still may hold herself responsible?

In purely logical, utilitarian terms of maximising the number of breathing individuals, you are right when you say that two people being dead is not better than one person being dead. But human beings have emotions too, and what this child and those around her ultimately feel about the operation, and the way they react to it, will not be determined by logic alone. It is very likely to happen that people will fill the surviving twin's head with their own moral confusions.

This case has caused so many humanists to fall into the 'preserve life at all costs' mentality of the so called 'pro-life' movement. In the "lost at sea" situation you depict, Theo, if neither wishes to survive at the expense of the other, then it is entirely reasonable for both to die.

Your statement that it is incumbent on the survivor to make the best of his or her life is precisely why this operation appals me. I have an intense dislike of the notion of having the moral responsibility of living my own life not just for myself, but also for the sake of someone else who 'sacrificed' himself. And it's not what others would think that would be important, it's how I would think of myself.

To speak of a 'right' to something implies that it is something of inherent benefit to an individual. When the 'pro-life' people speak of a right to life they mean nothing of the sort ... as they oppose any right to die, they really mean a 'duty to live' whether you like it or not. These two kids cannot make that choice for themselves, but what we can do is make that choice on the basis of what we would choose for ourselves in a similar position as the best guide available. To impose life on an unwilling recipient is as heinous as to kill someone who does wish to live.

Jeremy Jenkins

Patrick O'Donohoe (4th October 2000) : when Jeremy spoke of the 'preserve life at all costs' mentality really meaning a 'duty to live', this reminded me of the rather paradoxical news interview I saw a few days ago, with a member of (I think) Life, who was supporting the religious view against the operation (ie allowing both twins to die naturally). Why should a member of a "pro life" organisation support a course of action which will probably result in two deaths rather than one?

It would seem that many people going under the "pro life" tag would be better described as "pro religion", and the case of these twins is proving to be an uncomfortable twist in the tale for them. Perhaps some "pro lifers", if they wish to remain semantically correct, will now have to find a new label for themselves.

Patrick O'Donohoe

Theo Todman (5th October 2000) : Patrick, my view is that this is a quandary that affects all deontologists. There is no automatic procedure for deciding which of two commands to obey if they conflict. In the Siamese twin case we have an irreconcilable conflict between the (presumed) command to preserve life at all costs and that not to take it. Hence the tail spin and the "do nothing" approach as being allegedly the lesser of two evils. A consequentialist has no such logical problem, though the requirement to think through all the consequences, estimate the probabilities and actually take the decision, in the knowledge that ex post facto it might all turn out badly, does not make this the easy option.

Theo

Theo Todman (5th October 2000) : Jeremy, you seem to have ignored the counter-example of a Siamese twin having been through precisely this procedure and being happy with the decision and outcome. What someone who has been through the procedure feels carries more weight with me than what someone who hasn't got to go through with it thinks they might feel.

I agree with you about not taking the medicine if it's worse than the disease. Perish the thought that I should end up in a "dread disease" situation, but if I were to, I hope I'd have no intention of messing up my final two years with chemotherapy if the probability of success were low - but this has to do with probabilities and years of expected useful life. Some people do take this "non interventionist" option and it's perfectly rational. However, it's not an exact parallel to the case in hand where there's likelihood of success. In any case, If I were very young, I might take longer odds as the expected gain is greater.

I agree that doctors don't always "save lives at any cost". I agree that sometimes the

cost is too great and the odds too slim. That's why, in this case, we give up on Mary and go for it with Jodie.

Christopher Reeve is in no worse a state than Stephen Hawking. Both can (with assistance) do things with their lives. I'm not aware that Stephen, any more than Christopher, is keen for nature to take its course.

What would I say to Jodie if in 15 or 20 years time she said she was born together with her twin and they should have died together? The same as I say to my children when they say they never asked to be born - "stop being so stupid and be grateful".

I didn't say that the survivor should live for the other who was "sacrificed" - but simply be grateful for life and get on with it like anyone else. Any inability to escape false remorse is simply a hang-up to be shaken out of.

"To impose life on an unwilling recipient is as heinous as to kill someone who does wish to live." Really ? Well, firstly, we don't know that Jodie's unwilling. Secondly, killing is rather final, whereas under normal circumstances a person who really doesn't want to live can make their own arrangements in due course to remedy the situation. I agree that keeping someone alive in torment against their express wish is a very bad state of affairs - one effectively forced on people because of the anti-euthanasia laws - but this is not the situation we're in with Jodie.

I agree with your very useful distinction between the "right to life" and the "duty to live", and agree that pro-lifers do incline towards the latter, and that this is wrong. However, in our situation, we are (hypothetically) offering Jodie the opportunity to live - preserving her right to life when it is within our power to grant or withhold it. If, when she comes of age, she wants to end her life, that is her business - but I would try to persuade her out of it, especially if her reasons are the - to me - pathologically irrational ones that you seem to espouse.

Theo

Jeremy Jenkins (5th October 2000) : Theo, A few more comments in reply. I did read of the other parallel case, but it hasn't affected my view of the current case because:-

- I would need more information as to quite how similar the two medical situations were
- the cultural environment that Jodie will grow up in (unless she's left to live in the UK) will not be helpful
- it's easy for someone to say it was worth it from an 'ex-post' perspective. Would that person say the same from an 'ex-ante' point of view?

The probability of something like a "dread disease" happening to any of us at some point in the decades ahead is decidedly non-trivial, so it's not an entirely academic scenario ...

I wonder if medical staff view "non interventionist" people as being 'rational'. The tendency of doctors to run off seeking court injunctions to force treatment on minors is only one step away from doing the same to adults. Anybody who takes the view that medicine worse than the disease is best left untaken has a reasonable chance of experiencing a fundamental difference of opinion with medical people at some point in their lives. It would be nice to know you're not going to end up at the wrong end of a court case as a result, or worse still, ignored if you are incapable of putting up a fight.

I actually admire both Christopher Reeve and Stephen Hawking for their courage in the face of adversity. The point I was trying to make was that life should be worth living for what it is now, not for what it might be at some point in the future. In the case of Stephen Hawking, I think he would agree that the chance of any recovery or cure for him is minimal at best. As regards Christopher, I hope for his sake that even if any prospect of recovery was excluded, he would feel that his life was worth living for what it is now. Otherwise, I fear he is not doing what's best for himself.

Surely there's a difference between the occasional outburst of angst from the average child, and something like that from a child / teenager in the future Jodie's position? Especially if it's in response to other people telling her how heroic her sister was in 'dying for her.'

Perhaps I'm over-imagining things here, but I could envisage Jodie in future life being torn between a desire to die on the basis that she is not 'whole' because of the death of her twin, and the knowledge that if she did choose to die, she would be imposing an upsetting burden on her parents and other around her. Especially in that she will feel that an enormous effort will have been expended to give her the life she has, imperfect though it is.

I freely admit that my views on this case are not entirely the product of the logical, utilitarian part of my mind. It's something deeper, and I can't put my finger upon precisely what it is. The idea of having my own life preserved at the price of sacrificing another life - even another life that was doomed in any case - is something I cannot philosophically accept, at least for myself.

If two other people could come to an agreement whereby one would die so the other could live then fine by me, but I cannot comfortably countenance imposing such an agreement on someone else.

In our concern to prevent death, do we not realise that once a person is dead, it does not matter to that individual how long or short his life has been? What matters is what he has experienced while he was alive, and the effect he had on others in society.

Bearing this in mind, is preserving life at all costs really worth it?

Jeremy Jenkins

Theo Todman (6th October 2000) : Jeremy, I think we've come to the end of the line on this one as we've both stated our cases. I would, however, want to take you up on the contention that "once a person is dead, it does not matter to that individual how long or short his life has been". While, in a sense, this is true, the implications of applying the idea are rather scary. It would allow us to take away from someone the expected good of a long and fruitful life because, after their death, they wouldn't know we'd done it.

Theo

For your information, here's the article from *The Times* (Saturday 30th September), filched from *The Times* Web-site (via, at least this week, http://www.the-times.co.uk/news/pages/Saturday-Times/frontpage.html).

The pictures weren't on the site - they give a very positive image of Victoria Tieaskie.

'I survived the same operation that Jodie must face'
Article by Dominic Kennedy
September 30th 2000 United States

The only woman in the world who knows how the Siamese twin Jodie will feel has spoken of her joy at being given the chance of life in a separation operation that killed her sister. Victoria Tieaskie is now 30, married and training to be a children's nurse so that she can share her own fighting spirit with other children defying adversity.

She has survived 40 big surgical operations through her childhood to become a happy, healthy adult who can walk normally and might be able to become a mother.

Mrs Tieaskie was joined to her sister at the pelvic area in almost exactly the same way in which Jodie is now attached to Mary at St Mary's Hospital, Manchester.

When Victoria and her sister were born in 1969, senior doctors at a maternity hospital said that nature should prevail and "it" - the twins - must be allowed to die. A young trainee doctor helped to get the sisters to a team of specialists in another city, who performed the world's seventh operation to separate this kind of conjoined twins.

She is believed to be the oldest survivor of such surgery and has decided to break her long silence to send a message of hope to Jodie and Mary's parents.

"I am very grateful that I was given the chance," Mrs Tieaskie said. "Right now I have scars, but I am not handicapped in any way. I never felt I was saved at my twin's expense. She wouldn't have survived anyway. I know if she was supposed to have lived, she would have. It just wasn't meant to be."

The Maltese parents of Mary and Jodie have given up their court battle to stop the separation and are awaiting the surgery, which will kill Mary, in the next two months.

Victoria's mother, who was only 18, had no idea she was expecting twins when her daughters were born at the St John Medical Centre in Tulsa, Oklahoma, on December 22, 1969.

"The doctor didn't know what to call us because he had never seen anything like that before," Mrs Tieaskie said. "He never called us babies. He never called us girls."

The children were left to die, but a 28-year-old student doctor, David Sward, saw them and became curious. He checked the hospital library and found an article by an expert on Siamese twins who worked in Oklahoma City, only 100 miles away.

Dr Sward, now working in Arkansas, recalled: "What I did was, first of all, probably not ethical and, perhaps, illegal." With a couple of doctors from another hospital, he secretly did X-rays and tests on the twins, without getting permission from the obstetricians or paediatricians. "We were giving this kid sugar water and a little nourishment and penicillin to keep it from getting infected long enough until something could be done."

Dr Sward persuaded the nurses in the Tulsa hospital to arrange a transfer to the Children's Hospital in Oklahoma City. The twins were just two days old.

Like Mary, Victoria's twin, Veronica, had a malformed head and never breathed. She could live only while attached to her sister.

The doctors in Oklahoma City wanted to wait two months to separate the girls, but after two weeks Victoria suffered a heart attack from the strain of keeping her sister alive. The operation was performed as an emergency. Mrs Tieaskie said: "She was breathing off me. After they separated us, she immediately died."

Twice, when she was three months and 16 months old, surgeons broke her badly bowed legs to straighten them. She had to be put into a whole-body brace to prevent her moving her legs. She wore special shoes for clubbed feet until corrective surgery cured them. Victoria had few problems at school: "There was a little bit of teasing because I had to wear diapers for so long. As time went on, my body learnt to adapt.

"Right now I have two bladders because I still have hers. I'm flat-footed but that's OK. I have never had any psychological problem. I think it has made me tougher."

Mrs Tieaskie, a dialysis worker in Oklahoma City, has the chance of becoming a mother using her sister-in-law as a surrogate. She produces eggs, although she would be unable to carry a child herself.

She is passionate that Jodie should be separated from Mary. "It is not murder. It's saving a child who has fought this long to survive."

Victoria's mother, Debbie Purinton, said: "After she was born, they took her right

away and told me 'it' - I think they called her 'it' - would be dead by the morning. They put her in a corner, without any fluid, to die."

Victoria's father, who was also extremely young, found the pressure intolerable. Mrs Purinton, whose husband adopted Victoria, said: "Her biological father left when she was five and signed away parental rights. He had difficulty coping. We just dealt with it.

"To look at her from the outside, you wouldn't know she had this going on. She is a roadmap of scars. Most are round the hip and stomach and back. Her biggest complaint is she doesn't have a belly button. It went with the other baby.

"It really wasn't ever thought that we were sacrificing one to save the other because there was never any chance of her twin living anyway. You can't really think of it in terms of sacrificing one for the other. If not, you are sacrificing both. You are not even giving one the option."

Jeremy Jenkins (6th October 2000) : Yes, I think there's little chance of either of us convincing the other. However, I think we are both trying to approach the case from a humanitarian perspective, albeit with different conclusions.

I agree with you about the implications of this (not being over-concerned about the length of life) being a little scary, nevertheless I believe it to be true. Which is why, if I knew I only had a short time to live, I would like to think I would not fret too much about things that had gone wrong in life, as the capacity to regret would come to an end as soon as life ends.

Of course, from a religious point of view, it's even more scary. After all, if the result of being killed is not simply a cessation of existence, but a 'better' existence in a superior afterlife, surely the logical way to treat a mass-murderer would be to give him a medal, not a prison sentence!!

Jeremy Jenkins

Jeremy Jenkins (8th October 2000) : An interesting ethical variant on the Siamese twin case ... Jodie and Mary are two new-born (non-identical) twin girls. Instead of being conjoined, they are born separated. Jodie is a healthy child, however Mary's kidneys have both failed. Jodie is a tissue match for Mary - should one of her kidneys be taken and implanted into her sister?

Suppose the parents say that it is not 'God's Will' for this to be done, and they want Mary to be allowed to die naturally. They refuse to allow transplantation from Jodie into Mary.

Are the parents being reasonable or not? Should the doctors take them to court or not?

Jeremy Jenkins

Theo Todman (8th October 2000) : Interesting. My first temptation was to say "yes" to all these questions, but you might then widen the argument to include unrelated babies - why don't we raid any unwilling (or unaware) victim to help others ? I expect there would be alternative forms of treatment to hold the fort until either a willing donor comes on the scene or we get the hang of kidney-cultures, so, on this basis, I say "no".

This isn't really parallel to the case in hand, where both twins surviving for long isn't an option. What's happening, in any case ?

Theo

Jeremy Jenkins (9th October 2000) : The reason I put together this variant is because in this case one twin could be saved, but not at zero cost. But it's a price the other twin might well be willing to pay, if she was able to make up her own mind. But even assuming that her twin would die if the operation was not undertaken, I would still be very nervous about overruling the parents (but unlike on the separation case, I would at least be open to persuasion).

As Theo says, the problem that arises as soon as you say 'yes' in any case like this is that an incrementally different scenario comes along, and you are back to square one. There have been cases of bone marrow being taken from infants for transplantation - now this is different to kidney transplantation in that the effects on the donor are much less, and arguably for the recipient the treatment may fall into 'medicine worse than disease' category - but there has been a recent case where a baby was born specifically to be a bone marrow donor. hmmmmmm.

Being a humanist means that there can be no such thing as the moral equivalent of a knee-jerk reflex. Each scenario needs to be assessed on its own merits.

Last I heard on the Mary & Jodie case was from the Sunday Times, 1.10.2000 which suggested the Manchester doctors may be getting cold feet about doing the operation. http://www.sunday-times.co.uk/news/pages/sti/2000/10/01/stinwenws01031.html (extract below)

> .... Although the court of appeal ruled the operation should proceed, the Manchester surgeon at the centre of the legal battle has told colleagues that he is not prepared to carry it out.

Much of the apprehension surrounds the prospects for Jodie, whose survival is not guaranteed. Even if she survived the surgery, she would face further painful operations as well as double incontinence and possible paralysis.

The number of doctors in Britain capable of performing such a complex surgical procedure is tiny. All three previous attempts to separate Siamese twins in Manchester have ended in death for both children.

Experts at Great Ormond Street children's hospital in London, who have operated on 12 sets of Siamese twins, of which half have survived, confirmed they had not been asked to step in to separate the seven-week-old babies, who are joined at the pelvis and spine and share a digestive system.

Lewis Spitz, lead surgeon at Great Ormond Street, has, however, taken steps to prevent the operation from going ahead at St Mary's hospital in Manchester. On Friday he wrote to the Department of Health demanding that his unit receive recognition as the only centre equipped to do such surgery. Great Ormond Street has never separated Siamese twins against the wishes of their parents.

An injunction prevents the surgeons or family from talking about the case but the lead paediatric surgeon in Manchester is understood to have told colleagues he is very anxious about both babies dying under the scalpel as the world looks on ...

Jeremy Jenkins

October 2000 **Albert Dean**

COMMENTS & ODDS AND ENDS

Theo (C103/9) - Genetic Engineering : Remember I am not attempting to resolve your problem, only to raise points you may wish to take into account in evolving some solution or partial solution of your own.

I am not so sure you can comfortably set aside the parental right of a bull to have its offspring arrive as nature delivers it. Suppose later in genetic engineering we produce a bull that is quite intelligent. The bull will surely take a harsh view if it then catches us tampering with the style of its offspring in some way it does not like. Could we claim the bull has no right to resort to law. How might we defend our action. What penalty might a court inflict upon us. Is it not the case that, even though we know more is to come in evolution, we assume the parental bull is and always will be an

idiot, and then go on with the further assumption that an idiot has no views we need take into account.

Alternatively, could we claim there is a duty on the parental bull to let us experiment with its offspring for the good of ..... what; science, the general good, the good of cattle, the good of the offspring or of the offspring's offspring, the good of ourselves. But if we claim the last would that not create an implicit duty upon us to genetically engineer ourselves to have some kind of bull-brain addition, so we may better communicate with and understand the views of bulls.

Probably we actually have only one duty and one right in respect of cattle. Where we have the ability we have the duty to interfere clinically with parent or offspring when they are injured or ill. Where milk and meat are a vital part of our survival diet we have the right to take the milk and meat of the parent or offspring. We have this right because if the roles were reversed then cattle would have the same duty and right in their treatment of us. And one might care to consider what further duties and rights one would care to grant cattle if such a reversal came about; none I suspect.

But we want more. We always do. To obtain it we will bend our moral and legal codes to suit what we want to do. And the way we will do it is simply by changing the problem from an uncomfortable argument about whether we should do it, into a comfortable argument about how we should do it. Which will let us drift it all into some occasionally followed legislation and guide lines that set out "best practice". The implications of which two words should always be considered in depth in whatever field they are applied, because under them the system can proceed without having to think much about what it is doing whilst the rest of us can busily forget all about whatever the original question was.

To deal with two additional points simultaneously. You separately mention that there should be some limiting scope to the issue and that bulls are at present in fact outside the scope of much said earlier and above. I happily concede in both. But I think that eases nothing. In this question it is not what applies now, it is very much more what might come to apply if we proceed. And, in which case, the boundaries are then where-so-ever all the possibilities happen to be, and not necessarily where one might prefer them to be. Also, I suggest the fact bulls are at present not themselves parties to the discussion is in itself great reason we be that much more cautious. We are, after all, about to sentence the victim, and in truth we only consider the matter at all because if we get it wrong, then, step by step, we could destroy ourselves; and we know it.

Further. The polio virus is naturally invasive. Is it better to be rid of it, to be rid of ourselves, or to engineer it so it lives elsewhere, or makes a harmless guest, or to engineer ourselves so we live elsewhere, or may happily accommodate it. And, if an intelligent peanut turns up one day, will we have a case if we say we engineered your kind so they will not harm the allergic of us when they eat you or your babies. Surely we rest it all on an assumption evolution has achieved best practice and produced us.

Theo (C103/10) - Sanity : I think essentially you have in mind a question as to whether a genius can use the guide lines I set out to determine they are sane relative to the bulk of the population. I think it is accommodated where I said a question the subject may ask of themselves is whether in regard to some view they particularly hold they can understand the grounds by which most others have a different view. You will see this test is independent of how correct either view is and is much more to do with the dictionary's sanity requirement that the subject is able to perceive and understand the content of the world around them irrespective of whether or not they agree with it. With your suggestion a person is sane if their beliefs are held for defensible reasons, here I would only say what the dictionary says means sanity has a wording that seems very carefully crafted.

Theo (C103/10) - the Great Void (Second attempt!) : The trouble is a lot of the terminology is ambiguous and some say certain things do not exist whilst others say they do exist. I tried, probably too much, to accommodate every point of view. Suppose that universe means everything, including space and time as two energy fields, out to the assumed present boundary arising from the Big Bang That there is a heaven that contains its own similar things and constitutes a second universe. That if there is anything else then for simplicity it is either included as part of the two preceding universes or forms some third universe. Then, let universe, heaven and third universe, comprise the greater universe. What is left is that the greater universe is within a void that is not made of any form of energy, has no space or time, and is a great nothing.

What can we say of this void except it must be infinite in both extent and duration, always boundless, always present, and that it is a closed system. And, on inserting the greater universe in it, if anywhere in the void energy is not infinite in density then the energy of the greater universe in the void is finite.

Now, we know that locally energy is not infinitely dense, so, the greater universe is finite, and because the definitions imply energy can not enter or leave it, also it is a closed system.

Further, because energy can not be created or destroyed and can not enter or leave a closed system, we can say the greater universe always has and always will be made up of precisely the same amount of unstable energy it is presently made up of, and though its form has, is and will be subject to change, it also has always and will always be, with no beginning or end to it.

And all that put together means the greater universe has already been through an infinite number of cycles everywhere and will go through an infinite number of cycles more everywhere.

We can now look at life in this scenario. A box of matches is divisible. Separate the matches and box and fire can not be created. Bring them together and there are two ways to make fire, the easy way and the hard way. The easy way is obvious. The hard way is to rub the wood of the match-stick against the wood of the box until friction

does its work. I mention this only to illustrate there is flexibility in the rules for starting a fire, and flexibility in the system permits a great deal.

Grafting of plants demonstrates that life is divisible and combinable. Brain surgery will presumably demonstrate the same for intelligence, and one day soul surgery may also quite well show the same for goodness. Quanta of life, intelligence and goodness can not be created or destroyed. Therefore they are energy. So, redefining energy as entity. The amount of entity in the void is finite and fixed, and, in its various forms, always was, is and always will be the greater universe in all its forms.

Thus, the big bang was an explosion of entity, has happened an infinite number of times before everywhere and will happen an infinite number of times again everywhere. And, life, intelligence and goodness had no beginning and will have no end.

For the theologically minded. In the above, God is assumed to be part of heaven, with God being something like a vastly more powerful version of the Big Bang proto-particle, perhaps like a crystalline quark star in which data could be processed in incredible quantities at incredible rates, where the power to action a decision would be near limitless, with action and momentum in the void being achieved simply by the star sending part of itself as an active probe to deploy its parts into the form desired, akin to a fire-work, a way of creating a universe in nothing. And heaven is some sort of entity field possessed by and around the star, part of it. This star would of course be able to manipulate space and time within the greater universe.

I can of course understand why other views are held and will happily change the above if someone discloses an error in it.

Theo (C103/10) - Mathematics : Regarding the little signs to be attached to everything and mathematical symbols, I had it in mind only that one day swarms of micro-robots could scamper about the world and our notepads sticking little flags on everything to show us what symbols to write down and what to do with them to obtain the solution to any problem. Anyone could then do mathematics with ease. A step towards it would be an intelligent pocket computer for exams. Just let its bits run around over the question paper and then have them dodge around the answer paper jotting down the responses for you. Hold the paper up to the scanner to get a pass and chuck it away. Surely it would be the most energy saving way to obtain a certificate in that it would let us decommission just about all the education system. It would only be a small advance on today, where, with the better software packages, if you have to do something complicated a friendly looking little character can be called on screen to point at everything to click on to get it done.

A couple of items from the 14th October issue of New Scientist

I note these items for those who may have missed them because they raise several interesting points about life and evolution.

Primitive 1: About 200 different fungi, viruses and bacteria established themselves on the recently vacated Russian space station. It got to the stage where the crew ran out of cleaning rags and to carry on had to use their soiled underwear to try and remove colonies of these things off of working and other surfaces. Much time was lost dealing with the fungi that lived off practically anything and spread over work surfaces, and a good deal went on patching plastic insulation being consumed by the bacteria. In the small station powerful sterilising chemicals could not be used because the crew would have been affected. Over a few weeks some of the bacteria gradually increased their virulence in the low gravity but rapidly reverted to normal in a few days when returned to earth. That effect has been found repeatable in laboratory centrifuges.

Primitive 2: Humans, pigs and birds are repositories to greater or lesser extent of flue. The three human, pig and bird viruses do not have single strand RNA. They each have eight short RNA strands. Normal variations in flue arise from slight changes in the strands, they may for example lead to lung tissue producing excessive fluid. It seems that the great flue pandemics, such as that of 1917 which killed millions, may have arisen from when, say, the pig and bird viruses had swapped a complete strand. Apparently when that happens the resulting flue virus could be sufficiently virulent to, for example, cause lung tissue to dissolve.

Implications of all that would seem to be that primitive life has far more flexibility and aggression in it than we generally assume, and who can say but that a great deal of evolution of higher life forms might have come just from viruses, etc., swapping things about long ago. And possibly we have not been visited by aliens because no advance civilisation has yet been able to conquer its bugs.

Logic: It is said logic is value neutral. But logic prefers rightness. And rightness is goodness. So logic prefers goodness. And that is only not so if one has declared a badness to be a goodness. Comments?

Albert Dean

March 2000 **Frank Luger**

Memory Studies in Physiological Psychology at a Glance

The study of memory presents a difficult puzzle for research. In a sense, memory may be regarded as a central link between the mental and the physical aspects of existence; and as such, a prime feature of the human intellect and higher bodily functions. The main difficulty in studying memory is its *inaccessibility*, as well as its *overlaps to various degrees with learning, cognition, intelligence, creativity, motivation, emotion, etc.*

Memory, or the capacity to retain experience for future reference, is a truly magnificent phenomenon. It is the *sine qua non* of intelligence, or adaptive behavior. If prior experience would not exert a differential and normative influence upon subsequent behavior, life could be rather chaotic indeed. Habituation, stimulus and response generalizations, etc. would be inconceivable without the mediating effects of memory. The organism would be forced to make new responses to redundant environmental demands, being in a constant state of alert, quickly exhausting energy reservoirs, after which structural-functional breakdown and disintegration would inevitably follow. This magnificent neuropsychological capacity integrally contributes to minimal but indispensable psychophysical safety and efficient function on a routine basis.

Neither memory in particular, nor intelligence in general, may be regarded as a fixed 'hydraulic' trait; but as a dynamic adaptive capacity, that develops in response to environmental demands within the overall genetic framework. The *structural* equipment is *inherited,* while the *functional* abilities develop as prompted by *environmental* interactions. Heredity is the racehorse upon which the jockey of experience bounces from birth to death.

Is memory a structural capacity or a functional one? Perhaps both? There's no unequivocal consensus either way, and the venerable *nature-nurture controversy* is still unresolved. Most physiological psychologists would tend to gravitate toward the structural camp, while psychologists less rigorously trained in the natural sciences might favor the functional camp. There have been innumerable albeit unsuccessful attempts to *localize memory* as a structural feature, even down to the level of molecular biology. Memory research in physiological psychology continues largely in this vein, treating memory as both independent and dependent experimental variables, and hopes that the *memory trace* will eventually be found. Other psychologists, especially learning theorists, have argued that there's no need to assume that memory *has* to be a structural feature just because of genetics (remember, about 80% of 'pure' intelligence is inherited). Rather, memory may very well be a *function* of the various interconnections of the 10 billion neurons that make up its structural basis; just as the audiovisual experience of a working TV set cannot be equated with its wires and tubes. Some scholars propose that it may be a logical mistake to try to separate structure and function, just as the historical separation of mind and body in the sense of the old nature-nurture controversy was meaningless. Structure and function may be different sides of the same coin, similar to matter and energy; and any pigeonholing may be arbitrary and suspect.

While it may be possible to locate some physiological and biochemical features as primarily responsible for memory, it might be a gross oversimplification to attribute memory *solely* to differential synaptic transmissions or biochemical molecular combinations. Memory is not merely a storage capacity, it is not a warehouse into which bits of experience can be stuffed and retrieved upon demand. Rather, memory seems to be a *dynamic capacity*, in flexible interactions with structural changes, functional alterations, and various interrelated 'higher mental' processes, such as cognition, learning, intelligence, etc. Perhaps the concept of memory, along with other notions of 'mental function' may be regarded as a single concept of *behavioral ability*,

which may manifest itself in a well-nigh infinite variety of responses. Whether we talk separately about memory, cognition, learning, intelligence, etc. may be for the sake of contextual convenience; but fundamentally, they are situation-specific manifestations of the *same* underlying capacity for adaptive behavior- i.e. as *optimal* survival as possible.

Most traditional sources (for example, Dorland's Medical Dictionary, 1965) define memory along the lines of a 'mental faculty' by which sensations, impression, and ideas are recalled. Such definitions might be objectionable because 'recall' implies voluntary or conscious recall, whereas memory also mediates many responses of which we are unaware; and memory has enough bodily correlates to make any clearcut 'mental-physical' distinction a bit obsolete. Many memory studies in the professional literature simply bypass this dilemma altogether.

'Physiological psychology' may be regarded as the scientific study of brain-behavior relationships, interchangeably with such terms as 'neuropsychology' or 'psychophysiology' and including the systematic study of any physiological function related to behavior. 'Memory' itself may be thought of as '*a neuropsychological CNS feature through which past experience may exert a differential influence on present behavior in response to actual or perceived environmental demands'*. While this definition is admittedly quite a mouthful, it perhaps summarizes the above considerations; 1.) memory is a Central Nervous System feature, 2.) environmental stimuli differentially affect the organism in the sense of both duration and succession, and 3.) experience writes the book of life on the neonatally blank slate of behavior. Also, by implication, memory greatly facilitates adaptation dynamics.

Physiological psychology studies its subject-matter, in this case memory, within the broad framework of *empirical science*, which rests upon the *philosophy of science*. The ultimate aim of this approach is the establishment of *functional laws and reproducible processes*; in short, the reliable and valid identification of *invariances*, as required by epistemology, which then advance knowledge. In this quest, physiological psychology relies heavily upon the guideleines of experimental psychology for the formation of its research strategies. Experiments are designed to investigate possible relationships among research variables, while holding other (extraneous) variables constant. Usually this involves the purposeful manipulation of independent variable(s) and the observation of the differential effects of these manipulations upon the dependent variable. Causal relationships may be discovered by careful experimentation; and faithfully observed methodological rigor may eventually lead to useful theories.

Most experimental designs in this context treat memory as the dependent variable, and the brain or its particular aspects as the independent variable(s). However, certain techniques, such as electroconvulsive shock, or various drug treatments, etc., may use memory or its specific features as the independent variable(s), and the effects of such manipulations, as assessed by behavioral indications, as the dependent variable. Examples of such techniques might be ablations, lesions, stimulation, recordings, etc.

Since Hebb's famous postulates of 1949 in which he presented a "switchboard" model of neuropsychology based on the cytoarchitectonic structure of the brain involving various 'reverberating circuits' (e.g. Hebb, D.O.: *Textbook of Psychology*, 3rd ed, Philadelphia: Saunders, 1972), there have been several theories of memory, based on neurophysiology and biochemistry, structural, functional, or both; attempting to explain short, intermediate, and long-term memory. For example, the *statistical configuration* theory maintains that the common mode of activity in massive numbers of neurons in anatomically extensive systems represent information about learned experience. Different brain regions share a common mode of function during learning. Stimulus activates a representational system, which causes the release of a common activity mode, which will be stored during the learning experience.

In order to illustrate the diversity and the flavor of relevant research, some recent approaches of physiological psychology to the study of memory might be worth mention.

Some biochemical approaches may be focused on the synaptic functions in the mammalian CNS (central nervous system). Memory, in this context, may be associated with either the general metabolism of synaptic junctions, or with the more specialized presynaptic metabolism of neurotransmitters as well as their postsynaptic actions. Such research is promising.

Other approaches classified memory phenomena into the types of image, emotional, and conditioned reflexes. In these contexts, it is assumed that the prefrontal area is critically involved in image memory, especially STM (short-term memory); and emotional and conditioned reflexes are thought to depend on other parts of the neocortex and the paleocortex. However, these approaches are somewhat uncertain about the location and mechanism of LTM (long-term memory).

Some neurological studies on information encoding have proposed a gene-depression model of permanent memory, and theorized about the nature of the association between memory and the neuronal synthesis of RNA and protein.

Others have noted that memory deficits in animals may be alleviated by reactivation treatments. Deficits emanating from immaturity, experimentally-induced amnesia, interference, state-dependent learning, etc. are similarly affected. It is hypothesized that such sources of forgetting impair the retrieval of memories by common mechanisms, either in terms of retrieval effectiveness or by altering the retrieval process itself.

Drug research with animal subjects has explored the facilitation of learning and memory, as well as the analysis of mechanisms that might underlie memory storage.

Other studies have explored the mechanisms involved in protein synthesis as well as the roles of DNA and RNA and related biochemical questions bearing on memory research. The techniques used have ranged from bioassays and radioautography to scintillation and Geiger counting, etc.

Still others, having used cell fractionation and electron microscopy studies, hypothesized a mechanism whereby excitatory input produces alterations in a neuron which results in a long-term increase in transmitter release at its terminals. It was shown that impulse bombardement increases the number of synaptic vesicles. Innate and acquired processes in CNS memory functions may thus be distinguished.

Some research considered memory to be a multidimensional concept effected by several macromolecular changes in the protoplasm. The evanescent arranging and reinforcing mechanisms of memory were discussed in the context of RNA molecules functioning as inducers to depress the gene site during protein synthesis.

Various others felt that memory might reside in the morphology of neuronal arborescences. Namely, at birth the neurons are present in a 'primitive' form; but as a result of sensory experiential bombardement, rapid proliferation and branching occurs., keeping pace with the growth of memory and learning. The persistence of memory through topological lesions was cited as empirical support, among others.

Comparative studies have examined data from animal and human memory studies, within the theoretical frameworks of various models. Accesses to memory traces ('engrams') have been found facilitated by habituation and associative learning, and so on. These studies have made extensive use of electrophysiological analyses.

Electrical stimulation of various brain regions is a popular research technique in the study of memory. Among the recent interests is stimulation of the amygdala, or the substantia nigra, as well as other specific brain regions.

Electrical current had also been used for aversive conditioning in many thousands of experimental animals, especially rats. Following aversive conditioning, transcranial subconvulsive voltages had been used at various intervals to observe changes in memory.

Electroconvulsive shock(ECS) and amnesia induced thereby had been extensively employed in memory research. Most results seemed to indicate that ECS might interfere with retrieval rather than with storage. Usually reexposure to the training situation improves memory retrieval despite amnesia.

There were studies which had performed ablations of the visual cortex in rats and have observed that postoperative recovery of discrimination does not involve the relearning of new and independent engrams.

Some research concerned with brain lesions in the study of memory has associated the frontal lobes with STM and /or ITM (intermediate-term memory), and the temporal lobes with LTM, and examined information-processing mechanisms.

Others applied physicochemically induced spreading depression to the problems of interhemispheric memory transfer and subcortically controlled and associative and recovery-of-function processes.

Hibernation and cryogenic techniques had been used to test memory in Citellus Lateralis. It was found that hibernated or 'frozen' subjects had better retention of learned material than the control groups.

Neonatal mice were trained in T-mazes to observe the subsequent developmental changes. Some interesting longitudinal results have thus been obtained.

Paradoxical sleep as well as sleep disturbances by the use of EEG had been studied in relation to memory. EEG had also been used to test voluntary and involuntary memory in behavioral testing and various psychometric situations.

The complexity of the environment had also been manipulated in order to test memory storage differences.

Animal studies using behavioral indices in the testing of memory had been done for apes, goats, chickens equipped with monocular or binocular goggles, and others.

Somatic measures, cardiac and other physiological measures had also been used to test retention.

Immunology had been used to examine the role of antibodies with respect to memory. Brain homogenate was used to immunize rabbits, whose sera with Gamma-globulin was injected into recipient subjects. Significant memory suppression was found.

State-dependent memory processes had been studied from alcohol intoxication to the influence of various other drugs, such as Metrazol. Chronic users of marijuana showed no performance impairment when tested by psychometric techniques. However, marijuana may cause euphoria, visual and memory disturbances, as well as impairment of performance on verbal tasks, as shown by numerous studies in psychopharmacology. Magnesium pemoline (Cylert) increases depression, while methylphenidate (Ritalin) reduces fatigue; but these drugs have no differential effects on memory *per se.* Piracetam (UC13 6215) is nontoxic, does not interfere with general behavior, autonomic functions, arousal or the limbic system, yet it selectively improves memory on several counts, acting on the telencephalic integrative mechanisms ('nootropic'). Blockade of cholinergic structures at engram formation moments may be a determining factor in the mechanisms of the effects of scopolamine and benzacine (impaired conditioning). 100 mg/kg I.P. administration of orotic acid had been found to reduce extinction induced by both normal and electric shock. Camptothecin (as compared to actinomycin) intracranial injections (10-75 micrograms) had been found to depress LTM while having no effect on STM in goldfish. The involvement of biogenic amines in memory formation had been examined. Saline, reserpine, reserpine & DOPA, reserpine & 5-HTP, DOPA, 5-HTP, etc., were injected and found that normal levels of indole amines are important for memory formation. They seem to be primarily involved in passive avoidance, while catecholamines in active avoidance; and memory is affected accordingly. Other drugs that have been investigated in the study of memory would include flurothyl, puromycin, cholinergics, and various combinations with piracetam (SKF38462) and alcohol, etc.

In order to highlight the appropriateness of physiological psychology to the study of memory, it may be considered that there is little doubt that the psychologist *needs* the physiologist for both verification and explanation. It would be foolhardy to continue to hypothesize a permanent long-term memory if no permanent change can be found physiologically; likewise for any theoretical belief about a neurological change in the organism that is initiated by the reception and encoding of information. The psychologist is limited to behavioral indices of memory changes, but he is free to theorize what these changes may be as long as he does not demand that physiological structure and function be other than what they have been demonstrated to be.

Because of the physiologists' indispensable importance in the chain of verification and explanation of behavior change, a view has been leveled by students of memory which asks why psychologists who study memory are necessary at all. If the physiologists have to do all the explaining, why not leave the study of memory to them altogether. The answer to this query is really quite simple. The task of the research psychologist has always been descriptive and will remain so in the field of memory. But the (specialist) physiologist will need these (general) descriptions and theories in order to explain memory. It would be extremely difficult and perhaps misleading to attempt an explanation of memory without first having some theoretical orientation and description of what memory is. The stages of memory, its interactions between these stages and between other psychological variables, must all be described *and* comprehended *before* an explanation can begin. The physiologist is primarily trained to describe physiological structure and function. The psychologist is trained to describe overt (motor) behavior. Both types of description must occur before an explanation by correlation or causation may even be attempted. Obviously, what is needed are more neuro-and physio-psychologists; but the necessity for specialization in description at both ends of the spectrum must also remain and be approved.

So, if we imagine a spectrum of empirical research relevant to memory, psychologists would be found on one end while physiologists on the other. While the task of the first is behavioral description, that of the other is painstaking experimentation. It is thus evident, that *physiological psychologists*, by virtue of their *combined* training and research competence, occupy an intermediate portion of this spectrum. It may perhaps even be said, that the study of memory is a premise of (interdisciplinary, even eclectic) physiological psychology *par excellence.*

The *approach* that physiological psychology takes when studying memory may perhaps be best conceptualized as a multitude of various approaches, some more theoretical, others more empirical, etc. The past half-a-century of research, in particular, has shown that no single approach, whether structural, functional, or both, may be adequate to handle all the known facts about memory. Recent approaches are perhaps best described as *combinations* of various theories, methods, etc., that 'attack' memory by *multivariate design*, whether experimental or correlational. Undoubtedly, this refers to physiological psychology only. The physiologist, the pharmacologist, the biochemist, the molecular biologist, etc. handle specific, small details; while the psychologist, whether learning theorist or of some other orientation, would handle more broad or global observations. Physiological psychologists must draw on all

angles, eclectically taking the best from every neighbor and relative, to handle the problem of memory most appositely. The physiological psychologist, armed with his psychological knowledge, knows how to evaluate behavior, which observation to use, and what theory to take to the laboratory for empirical verification and further experimentation. For he must be equally at home in the laboratory, he must be well-versed in all aspects of experimentation, and he must have a solid knowledge of physiology and psychopharmacology as well, if he is to handle the riddles of memory in his laboratory in a meaningful fashion. His approach may be likened to a bridge between the concrete and the abstract, or between tangible data and theory. In our era of overspecialization, his task is a formidably frustrating one, yet he is the only one in the proper position of handling such complex problems as memory.

A few words about *theoretical approaches* to memory might be appropriate. There have been theorists who have conceptualized memory as a single mechanism whereby learned experience is permanently stored. They have speculated that stimulus modalities by virtues of repetitive exposures will bring about structural changes in the CNS. Historical origins of such theories may be dated as far back as the times of the British empiricists. Most theories of this type would perhaps be best described as *structural* in nature. For example, neuronal growth or the structure of synapses, or the chemical composition of the transmitter substance itself, etc. have all been considered as possible structures responsible for memory storage. However, most of these theories use LTM techniques, while if memory decay occurs at all, it is most evident in the unstable STM phase. Nevertheless, research in this vein continues very actively, especially on the biochemical and the neuropharmacological levels.

While some scholars prefer to conceptualize memory as a single mechanism, the majority of physiological psychologists, especially since Hebb's 1949 postulates, have come to regard memory as a *dual process* consisting of a very short, unstable phase, usually lasting but a few seconds, designated as *STM*; and a permanent, long-term structural change, whereby memory is stored, designated as *LTM.* To this dual concept, a third newcomer was added, intermediate-term-memory or *ITM*; that is more enduring than STM, but has not been transformed into permanent forms of storage as yet.

The process whereby STM is gradually transformed into LTM is referred to as the *consolidation hypothesis*. This is based on clinical data of retrograde amnesia, and maintains that the establishment of a permanent memory engram is the *function of time.* This consolidation process may take a variable time interval for its completion, and it is subject to interference and disruption. Hebb had suggested that this process may take place in the form of reverberatory activity in various neuronal circuits (ibid).

It must be mentioned that the consolidation hypothesis is not indispensable. Most suggestions regarding the permanent storage of memory have given little more than *ad hoc* consideration to the consolidation hypothesis. However, the view that the consolidation hypothesis is incorrect is not currently popular- most theorists would accept the notion, even if somewhat reluctantly. On the other hand, none of the suggested storage mechanisms appear to be dependent on the consolidation notion, and some may even be less cumbersome without it.

Before examining in a little more detail the approach of physiological psychology to STM and LTM, it must be said, that theories of these forms of memory are legion, both in physiological psychology and other interested fields. Yet, despite a plethora of exhaustive literature on memory, *we still don't know just what memory is.* We know that there is something whereby previous experience modifies subsequent behavior in any temporal sense, whether long-term, or short-term or both. Everyone knows that even in the absence of environmental demands, we can remember. *How* we remember, *what* precise mechanisms are involved, and what the *nature* of memory is; is still a mystery.

The study of short-term memory is intimately bound up with investigations of the *consolidation process.* Since STM by definition is unstable, it was assumed that the dividing line between STM and LTM was drawn by ITM, at the point of which memory becomes stable. This point was very difficult to locate in time. There were great variations from individual to individual, from task to task, etc. Two trends of thought have emerged from the varieties of research findings; the more physiological point of view held that stable memory is LTM and everything else is STM; and the more psychological point of view that held the consolidation hypothesis to be a flexible, time and task- dependent process, which may take anywhere from seconds to weeks to stabilize the engram. In this view, STM was meant to be the *immediate recall* upon single exposure to stimulus material, usually a few seconds. Interestingly enough, in physiological psychology STM was studied backwards, i.e. if the consolidation process was successfully disrupted at various time intervals, memory was assumed to be still in the STM phase. It soon became clear, however, that it is not reasonable to assume that memory in the consolidation process is qualitatively the same as in STM. Consolidation was increasingly referred to as a *continuum*, from STM to LTM, and as such, a function of time and stimulus repetition or rehearsal.

There were two different approaches to the study of the consolidation process, hence, indirectly, to the study of STM. These are techniques for the disruption, or techniques for the facilitation of the consolidation process. These techniques range from ECS, lesions, direct stimulation, etc. to the use of various drugs.

Electroconvulsive shock in clinical practice produced retrograde amnesia. ECS had gradually become one of the major tools for studying the consolidation process. The early research paradigms had shown that if ECS is given soon after training, it disrupts memory, but not if given later.

For example, rats exhibited impaired avoidance behavior following ECS. This was interpreted as evidence in favor of the consolidation hypothesis, which was assumed to last approximately 15 minutes.

However, in recent years there has been an increasing reluctance to accept such studies as these, as evidences to the correctness of the consolidation hypothesis. Not only has the validity of the consolidation hypothesis itself been questioned, but it has been pointed out that ECS has many other consequences that may have confounding

effects on the studies. ECS seems to interfere with memory retrieval and performance, rather than with memory *per se.*

There have been numerous attempts to localize the consolidation process by lesions or direct electrical stimulation. However, these attempts have been unsuccessful. The entire cerebral cortex seems to be involved. No single area can be reliably and validly demonstrated to be responsible for memory consolidation.

Local depressing agents have been used to create waves of spreading depressions whereby consolidation may be studied. Potassium chloride (KCl) is such an agent. It changes the potassium concentration of extracellular fluid (ECF) and creates a state of transient hyperpolarization. The resulting electrical activity can be monitored on EEG which will show a characteristic flattened-wave pattern. However, this technique, while yielding valuable data about the cerebral cortex, does not show any localization of the engram or its consolidation at all.

Retrograde amnesia or memory blockage has been produced by conditioned competing responses, as well as puromycin, physostigmine, and anticholinergic drugs.

Facilitation of memory has been observed by hibernation, and such drugs as flurothyl, strychnine, picrotoxin, caffeine, amphetamines, etc. It has been hypothesized, that such a facilitation may be due either to an acceleration of consolidation, or to an intensification of the reverberating electrical activity, or both. However, it has not been clear, whether memory storage or retrieval was facilitated. This takes us to LTM.

The approach of physiological psychology to the study of long-term memory has been centered around *mechanisms of storage.* Even though storage *per se* has never been demonstrated, its hypothesized existence is still the most plausible explanation that the physiological psychologist is prepared to offer. Indeed, it would be difficult to conceive just how memory can persist, albeit with distortions due to time (interferences, forgetting, senility, etc.), if it is not somehow 'stored' for subsequent reference. While the ultimate answer (if there's such thing) is still to be found, recent theories favor either *increased neuronal growth,* or some *permanent biochemical change,* resulting from repeated stimulus bombardments, as possible storage mechanisms.

With respect to the first theoretical mechanism, several studies have reported increased brain weight, as a result of environmental complexity; or differences in memory storage because of environments of varying complexity. Neuronal growth alone was thought to be responsible for the development of storage capacity. Also, synaptic changes might account for the phenomenon. However, it was soon suggested that neuronal changes as the result of environmental manipulations may be due to a shift in the levels of cholinesterase. This has led to vigorous research on the biochemical level to find memory storage mechanisms.

Change in biochemical composition as a factor that explains the storage of memory has been approached by physiological psychologists on two levels: *molar* and *molecular.*

The *molar approach* would focus on synaptic changes, transmitter changes, and intraneuronal activity. Acetylcholine and cholinesterase levels have been investigated through this molar approach. However, the concentration changes in these substances are transient, which militates against the notion of storage mechanism. Neuronal changes have been considered, but to little avail. Despite the failure of the molar approach to explain memory storage, research on synaptic changes, transmitter and neuronal changes continues to be quite active.

However, it is the *molecular approach* that has been the most popular in recent investigations of long-term memory. This approach would focus upon the changes in biochemical configuration induced by impulse modalities. In other words, storage of memory *within the neuron* was hypothesized to be in the *sequences of macromolecules.* Specifically, DNA, RNA, and various protein molecules have been proposed as storage sites of memory. However, DNA has been ruled out. Even though it has been demonstrated that DNA plays a very important role in genetic inheritance, DNA is a very stable molecule. If DNA would store memory, memory should be inheritable. Since there is no evidence to suggest this, and the stability of DNA would make it impossible for experience to modify its biochemical structure, DNA has been discounted.

The unstable nature of RNA makes this substance a good candidate for LTM storage studies. At least, RNA is modifiable relatively easily. Therefore, experience may influence its composition. RNA has been shown to be continuously resynthesized to ensure its relative stability. It is thus conceivable that the *encoding of the engram* may take place in RNA. Indeed, qualitative changes in RNA have been observed as a result of training. However, interanimal transfer studies of 'trained' RNA were largely inconclusive. These attempts may have failed because the transfer itself may be sensitization; RNA extraction techniques may still be somewhat crude, and testing criteria may still need precision and refinement. Yet, this line of research is promising.

Another possible candidate for LTM storage is *protein synthesis*. Despite a certain skepticism, there have been several studies either facilitating protein synthesis by such drugs as TCAP, or inhibiting it by such drugs as puromycin or other antibiotics. Even though such studies can be replicated more reliably, it is possible that drug injections alone fail to confirm the hypothesis, since they influence not only RNA but other substances as well. In spite of such potential or actual confounding, there have been enough encouraging results to allow some cautious optimism.

Finally, in the medical literature it is the temporal lobe that has been postulated as the possible location of memory, based on clinical observations of seizures, bilateral lobotomies, and psychic memory disturbances associated with temporal lobe stimulations. While this hypothesis may fit the clinical data, the definite location of memory in the temporal lobe has yet to be demonstrated.

Modern physiological psychology is the outgrowth of the empirical tradition of experimental psychology, physiology, learning theory, etc.; it thus lends support to the

study of memory on every count. In this tradition, memory studies have been conducted in psychological research on learning, clinical psychology, and several other interested fields. However, it is physiological psychology, the combination of behavioral description and solid experimental empiricism, that has been shown to be the most appropriate vehicle for the study of the stubbornly elusive phenomenon of memory.

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