

ELECTRONIC NETWORKING FOR PHILOSOPHICAL DEVELOPMENT IN THE PRINCIPIA CYBERNETICA PROJECT

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The Principia Cybernetica Project (PCP) is a collaborative attempt to develop a complete cybernetic and evolutionary philosophy. Such a philosophical system should arise from a transdisciplinary unification and foundation of the domain of Systems Theory and Cybernetics. PCP is meta-cybernetical in that we intend to use cybernetic tools and methods to analyze and develop cybernetic theory, which include the computer-based tools of hypertext, electronic mail, electronic publishing, and knowledge structuring software. They are meant to support the process of collaborative theory-building by a variety of contributors, with different backgrounds and living in different parts of the world.

1 Principia Cybernetica in a Nutshell

The Principia Cybernetica Project (PCP) is a collaborative attempt to develop a complete cybernetic and evolutionary philosophy. Such a philosophical system should arise from a transdisciplinary unification and foundation of the domain of Systems Theory and Cybernetics. Similar to the metamathematical character of Whitehead and Russell's *Principia Mathematica*, PCP is meta-cybernetical in that we intend to use cybernetic tools and methods to analyze and develop cybernetic theory.

These include the computer-based tools of hypertext, electronic mail, electronic publishing, and knowledge structuring software. They are

meant to support the process of collaborative theory-building by a variety of contributors, with different backgrounds and living in different parts of the world. PCP will thus naturally develop in the *cyberspace* of interlinked electronic networks, as implemented for example in the World-Wide Web distributed hypertext software.

PCP is to be developed as a dynamic, multi-dimensional conceptual network. The basic architecture consists of nodes, containing expositions and definitions of concepts, connected by links, representing the associations that exist between the concepts. Both nodes and links can belong to different types, expressing different semantic and practical categories.

As its name implies, PCP will focus on the clarification of fundamental concepts and principles

of the broadly defined domain of cybernetics and systems, which includes related disciplines such as the *sciences of complexity*, AI, ALife, Cognitive Science, Evolutionary Systems, etc. Concepts include: Complexity, Information, Entropy, System, Freedom, Control, Self-organization, Emergence, etc. Principles are for example Natural Selection, *the whole is more than the sum of its parts*, and the Laws of Requisite Variety, of Requisite Hierarchy, and of Regulatory Models.

The PCP philosophical system is to be seen as a clearly thought out and well-formulated, global *world view*, integrating the different domains of knowledge and experience. It should provide an answer to the basic questions: *Who am I? Where do I come from? Where am I going to?*

The PCP philosophy is systemic and evolutionary, based on the spontaneous emergence of higher levels of organization or control (metasystem transitions) through blind variation and natural selection. It includes:

- a) a metaphysics, based on processes or actions as ontological primitives,
- b) an epistemology, which understands knowledge as constructed by the subject or group, but undergoing selection by the environment;
- c) an ethics, with survival and the continuance of the process of evolution as supreme values.

Philosophy and implementation of PCP are united by their common framework based on cybernetic and evolutionary principles: the computer-support system is intended to amplify the spontaneous development of knowledge which forms the main theme of the philosophy.

PCP is managed by a board of editors (presently V. Turchin [CUNY, New York], C. Joslyn [NASA and SUNY Binghamton] and F. Heylighen [Free University of Brussels]). Contributors are kept informed through the PRNCYB-L electronic mailing list, and the Principia Cybernetica Newsletter, distributed in print and by e-mail. Further activities of PCP are publications in journals or books, and the organization of meetings or symposia. More information about PCP is available by anonymous FTP at

is1.vub.ac.be,
directory

/pub/projects/Principia_Cybernetica,

on World-Wide Web

(<http://pespmc1.vub.ac.be>)

or by an e-mail request to

fheyligh@vnet3.vub.ac.be.

2 Rationale

PCP is about Philosophy. But what is philosophy? Philosophy intends to answer the questions: Who am I? Where do I come from? Where am I going? What is knowledge? What is truth? What is good? What is evil? What should my supreme goals in life be, and what is the meaning of life? But there is a huge literature on philosophy. What is new here?

Every time has its own approach to these eternal philosophical questions, deriving from its knowledge and technology. We hold that in our time, the age of information, it is systems science and cybernetics, as the general sciences of organization and communication, that can provide the basis for contemporary philosophy. Therefore, this philosophical system is derived from, and further develops, the basic principles of cybernetics.

Moreover, we start from the thesis that systems at all levels have been constructed by evolution, which we see as a continuing process of variation and natural selection of the *fittest* configuration. Evolution continuously adds complexity and makes systems more adaptive by giving them better control over their environments. Control in cybernetics implies the existence of choice from a variety of actions (freedom), and the competence or knowledge to choose the action most likely to bring the system closer to its goals (constraint). The complementary creation of freedom and constraint is realized when a new level of control emerges. We call this a *metasystem transition*, and consider it as the quantum of evolution.

As cybernetic theory informs our philosophy, so cybernetic technology lets us do things that philosophers of other times could never do. Using computer technology, we develop a large philosophical text from many nodes which are linked together with different relationships. Readers can navigate among the many concepts, guided by their individual understanding and interests. Disparate material can be integrated together while being written and read by collaborators from all around the world.

We hold that PCP is more than an interesting experiment, and that there is an acute need for an approach similar to PCP. The ongoing explosion and fragmentation of knowledge demands a renewed effort at integration. This has always been the dream of the systems theorists; all they lacked was the appropriate technology to attack the complexity of the task. The remainder of this text sketches some of the electronic tools we are presently using to support the project.

The proposed philosophy, constituting the content of the project, and the conceived distributed hypermedia/e-mail implementation, constituting the form of the project, are in fact closely connected. Both are constructive, in the sense that they start from *primitive* systems from a variety of origins (nodes containing expositions written by diverse participants), which are brought into contact (e-mail conversations, and links to shared files), connected (semantic links), and selectively stabilized, so as to retain those combinations which define a new, more integrated system.

When constructing a cybernetic philosophy the fundamental building blocks that we need are ideas: concepts and systems of concepts. Ideas, similarly to genes, undergo a variation-and-selection type of evolution, characterized by mutations and recombinations of ideas, and by their spreading and selective reproduction or retention. The basic methodology for quickly developing a system as complex as a cybernetic philosophy would consist in supporting, directing and amplifying this natural development with the help of cybernetic technologies and methods.

It will require, first, a large variety of concepts or ideas, provided by a variety of sources: different contributors to the project with different scientific and cultural backgrounds. These people need a fast, flexible communication tool: electronic mail. Second, we need a practical way for storing the thus gathered information, and for making it available all over the world: file servers. Third, we need a system that allows the representation of different types of combinations or associations of concepts: hypermedia. Fourth, we need selection criteria, for creating combinations of concepts, that are partly internal to the system (e.g. consistency, simplicity ...), partly defined by the requirements of the people that are developing the system (consensus, ...). Finally, we will need

procedures for reformulating the system of concepts (knowledge structuring, closure, ...), building further on the newly selected recombinations, with the help of the concepts of emergence, and especially of metasystem transition.

3 The PRNCYB-L Electronic Mailing List

We are using the PRNCYB-L mailing list on the BINGVMB computer system at SUNY-Binghamton in New York. PRNCYB-L is a LIST-SERV mailing list combining the functions of a message board and a file storage server.

3.1 Purpose

PRNCYB-L provides an open forum for all participants in the project, allowing interactive discussions about all issues related to PCP. It functions as the main medium for communication about the Project.

At present, over 50 people, representing the 5 continents, subscribe to PRNCYB-L. Topics that have been discussed include: entropy increase and self-organization, causality as covariation, thermodynamics and evolution of mortality, memetics and the evolution of cooperation, formal expression, criteria for reality. A selection of relevant information (e.g. congress announcements, publications; on hypertext, electronic publishing, evolution of the brain, ...) from other electronic forums is regularly cross-posted on PRNCYB-L.

A digest, or summary, of the discussions and node development on PRNCYB-L will be produced, and published in the Newsletter. It is sent to all people on our list of potential PCP contributors, including those who do not have access to electronic mail or who otherwise want only summary information about the project.

The mailing list is not meant for idle chattering or uninformative technicalities. It is also not meant as a general forum for discussion about cybernetics and systems science. Such a forum already exists in the mailing list CYBSYS-L (contact Joslyn for more information). Whereas CYBSYS-L is open to anyone with an interest in cybernetics and systems, PRNCYB-L is restricted to active participants and those who wish to be informed about the specifics of PCP.

3.2 How does it work?

The functioning of the list is very simple, and does not require any technical knowledge. If you are subscribed to PRNCYB-L, you will automatically and immediately receive all messages sent to the list on your e-mail address. In this way the mailing list functions as a *live* Newsletter about the project, keeping you abreast of conceptual developments, as well as practical opportunities, such as workshops or publications.

Once subscribed, if you wish to contribute yourself, you just send an electronic mail message to the list address, and it will be automatically broadcasted to all others who have subscribed. In that way you can mail out e.g. questions, proposals, or reactions.

The third function of PRNCYB-L is the file server. Files containing larger pieces of information (e.g. PCP nodes, publications, bibliographies, logbooks of past discussions) are stored in a central computer. They can be requested by any subscriber by sending a simple e-mail command message to the file server address.

3.3 Contributing to PRNCYB-L

Participants can best contribute to PCP by posting to PRNCYB-L. But for those who cannot use e-mail, we will accept contributions on a diskette file. MS-DOS diskettes (double density only) can be sent to Joslyn's address below; Macintosh, or MS-DOS (3.5", 720 Kb only) diskettes to Heylighen. The formats we can accept are straight ASCII or *text only* (preferred); TeX, LaTeX or Word Perfect (IBM only) [Joslyn]; Word, WordPerfect or other common word processors [Heylighen].

Those people who do not use e-mail as yet are encouraged to inquire about available facilities at their university or research center (these may not exist in Eastern Europe, or certain other regions). Although e-mail does require a (short) learning period, its use is in general quite simple once somebody has explained the conventions to you (these can be different for different computers and networks). It does not require any knowledge of computer science or programming.

If you wish to join PRNCYB-L, please send an e-mail note to the address:

cjoslyn@bingsuns.cc.binghamton.edu

containing the following information:

- 1) Name.
- 2) E-mail address.
- 3) Postal address.
- 4) Phone.
- 5) Affiliations.
- 6) How did you hear about PCP?
- 7) Do you wish to be a full subscriber to PRNCYB-L, or just receive the Digest?
- 8) Please take at least one page to describe your work and how it might relate to PCP.

You will then be added to the mailing list, and receive initial instructions on how to operate the LISTSERV software.

4 The Principia Cybernetica FTP-server

The Computing Center of the Free University of Brussels (VUB) has put up an anonymous FTP-file server for PCP. FTP allows a much more interactive, universal and user-friendly way of retrieving files than the PRNCYB-L file server. The server is freely available for everybody on the Internet. In a further stage we hope to complement this FTP server by a Gopher server.

To retrieve a PCP file by FTP from a Unix/Internet site, connect to the host by typing:

```
ftp is1.vub.ac.be.
```

When you are asked for your login, type:
anonymous.

Enter your e-mail address as password. Then change directories ('cd' command) by typing:

```
cd /pub/projects/Principia_Cybernetica
```

To show the available files and directories, type:
ls.

You will get a list of subdirectories, including the following:

/Misc.Info: contains diverse information (reports, bibliography, ...) on tools that may be useful for PCP, such as WWW.

/News: contains the newsletters distributed about PCP, and reports on PCP activities.

/Nodes: contains preliminary concept definitions developed by the PCP-editors, to be organized as a hypertext, semantic network.

/Papers_Heylighen: contains papers on PCP themes by PCP-editor Francis Heylighen.

/Papers_Joslyn: contains papers on PCP themes by PCP-editor Cliff Joslyn.

/Papers_Turchin: contains papers on PCP themes by PCP-editor Valentin Turchin.

/Papers_Others: contains papers on or related to PCP by other contributors.

/PCP-Web: contains a mirror of our hypertext-files for World-Wide Web (see next section).

/PRNCYB-L: contains material (discussions, list of members) from the PRNCYB-L mailing list.

/Software: contains the *HyperVision* application, a simple hypertext viewer and editor for MS-DOS, and browsers for WWW (see further).

/Texts_General: contains introductory or overview papers by the editors collectively, and collected contributions of others, including the workbook of the PCP Workshop in Brussels, 1991.

/WF-issue: contains draft papers contributed by the editors and others for a special issue of *World Futures: the journal of general evolution* devoted to the theory of Metasystem Transitions, which forms the core of the PCP philosophy.

Most of the files available on this server are in ASCII format, and should be retrieved as text. The '.txt' file suffix denotes pure text files, that can be read as such. The '.tex' suffix denotes ASCII files formatted in \LaTeX which should ideally be processed by a \LaTeX editor in order to reconstruct formats, formulas and figures, but where the text is mostly readable as such.

Again change to the directory you want and list the available files. You can then retrieve the file you want with 'get' followed by the filename, e.g.:

```
get Workbook.txt.
```

When you have the file(s) you want, type:

```
quit.
```

In case of doubt or difficulty, consult your system manager.

Where the above procedures are not available (e.g. from Bitnet or other networks), there are two gateway filesystems:

```
ftpmail@decwrl.dec.com
```

and

```
bitftp@pucc.bitnet
```

that will do the transfer for you. To one or the other of them, send the following one line message by e-mail:

```
help
```

for instructions (which will be similar to the above, but will be in the form of a series of lines in an e-mail message

```
ftpmail or bitftp
```

that will then execute for you).

5 Principia Cybernetica on World-Wide Web

We have recently started up a new PCP server for distributed hypertext, in the World-Wide Web (WWW) format. WWW is an extension to, and integration of, other Internet services, such as telnet, newsgroups, FTP, gopher and WAIS. WWW combines extreme power (it does everything the other systems do and more), with maximal simplicity and ease of use. WWW allows you to fetch files ('documents'), containing hypertext links to other, related files, which may reside in different parts of the world. By selecting one of the links, you automatically fetch the linked files. In that way you can navigate through a world-wide network of interconnected documents, without having to type in any commands. WWW also offers multimedia support on the appropriate platforms: hypertexts may contain color images, sounds and even animations.

WWW software is freely available for all major computer platforms, and only requires an Internet connection. More information about WWW can be found by anonymous FTP to `info.cern.ch`, (directory: `/pub/www/doc` for 'paper copies' of articles on WWW in PostScript and ASCII forms) or to the PCP FTP server (directory: `.../Misc.Info`). An even better introduction can be got by directly logging in to the Web, using telnet to one of the following hosts (in mainframe systems, the command is normally telnet

followed by one of the following addresses or IP numbers):

`info.cern.ch` (IP number 128.141.201.74): No password required.

`eies2.njit.edu` (IP number 128.235.1.43): Log in as `www`. A full-screen browser.

`vms.huji.ac.il` (IP number 128.139.4.3): Log in as `www`.

`kufacts.cc.ukans.edu`: Login as `www`.

`ukanaix.cc.ukans.edu`: Full screen browser, requires a VT100 terminal. Log in as `www`.

Free WWW-software ('browsers') can be found by anonymous FTP at the following places:

`ftp.ncsa.uiuc.edu`, in directory `/Mosaic` or

`/Mac/Mosaic`: Mosaic multimedia browser for X-Windows, Mac and Microsoft Windows.

`fatty.law.cornell.edu`, in directory `/pub/LII/cello`: Browser for Microsoft Windows.

`info.cern.ch`, in directory `/pub/www/bin`: Several browsers (Mac, NeXt, Dec...).

Once you are connected to WWW, the PCP Web can be found on the geographical list of all WWW-servers under 'Europe: Belgium', or on the following WWW-address ('URL'):

`http://pespmc1.vub.ac.be/`

In the near future, all material collected by PCP will be made available on the Web in the form of linked nodes. The Web is to function as the main medium for practical and theoretical development of PCP, containing all definitions of concepts and principles, linked together by semantic relationships. Later, the Web will also provide the capacity for people reading nodes to make annotations with comments or criticisms, thus providing a computer support system for truly worldwide collaboration.

5.1 Retrieving WWW-files by e-mail

People who are not directly connected to the Internet, yet can use e-mail (e.g. through Bitnet or CompuServe) can still get WWW-files by sending a message to the address:

`listserv@info.cern.ch`

The message should consist of one or more lines, each containing the command `SEND` followed by the WWW-address (URL) of a desired document. E.g. for the PCP default home page a command line would read:

`SEND http://pespmc1.vub.ac.be/`

General info about WWW can be found at the following addresses:

`http://www.vuw.ac.nz:`

`80/non-local/gnat/www-faq.html;`

`http://info.cern.ch`

`/hypertext/WWW/Summary.html`

`http://pulua.hcc.hawaii.edu`

`/guide/www.guide.html`

`http://info.cern.ch`

`/hypertext/WWW/TheProject.html`

The `SEND` command returns the hypertext document with the given W3 address, formatted to 72 character width (ASCII, text-only), with links numbered. A separate list at the end gives the document-addresses of the linked documents, which can then be requested by a subsequent message. In this way, you can navigate through the Web, albeit only at mail speed. As WWW links to FTP, this mail service can also be used to retrieve FTP-files but it is better to use the previously mentioned gateways for FTP, in order not to overburden the system.

6 PCP Publications

Several texts on the PCP are now available, and more are being planned.

6.1 Workbook

Heylighen F. (ed.) (1991): *Workbook of the 1st Principia Cybernetica Workshop* (Principia Cybernetica, Brussels-New York).

This booklet (70 pages) contains short articles and abstracts presented at the Workshop in Brussels. Presently it provides the most complete overview of PCP related work. It is available on the FTP-server or in printed form from F. Heylighen for free.

6.2 Papers

In addition to the papers in the Workbook, the following papers directly address PCP, or its underlying philosophy. Most of these texts are available on the FTP-file server, where they can be automatically requested. Papers can also be requested from their respective authors. However, because of our limited facilities and the virtually unlimited number of people interested in PCP, we cannot send all papers to everybody. So we would appreciate if you would only ask hard copy reprints for papers that you really need and cannot get in any other way.

Heylighen F. (1991): *Cognitive Levels of Evolution: pre-rational to meta-rational*, in: The Cybernetics of Complex Systems, F. Geyer (ed.), (Intersystems, Salinas, California), pp. 75-92.

Heylighen F. (1992): *Principles of Systems and Cybernetics*, in: Cybernetics and Systems '92, R. Trappl (ed.), (World Science, Singapore), pp. 3-10.

Heylighen F., Joslyn C. & Turchin V. (1991): *A Short Introduction to the Principia Cybernetica Project*, Journal of Ideas 2, #1, pp. 26-29.

Heylighen F. (1993): *Selection Criteria for the Evolution of Knowledge*, in: Proc. 13th Int. Congress on Cybernetics (Association Internat. de Cybernetique, Namur), p. 529.

Joslyn C., Heylighen F. & Turchin V. (1993): *Synopsys of the Principia Cybernetica Project*, in: Proc. 13th Int. Congress on Cybernetics (Association Internationale de Cybernetique, Namur), p. 509.

Joslyn C. (1991): *Tools for the Development of Consensually-Based Philosophical Systems: a feasibility study for the Principia Cybernetica Project* (Principia Cybernetica Technical Report).

Joslyn, C. (1991): *Control Theory and Cybernetic Ontology*, (Principia Cybernetica Technical Report, long version of the paper on p. 24 of the Workbook).

Lichtenstein B. (1991): *A difference that makes a difference: cybernetic inquiry and post-modern philosophy*, in: The Cybernetics of Complex Systems, F. Geyer (ed.), (Intersystems, Salinas, California), pp. 11-20.

Moritz E. (1991): *On the Road to Cybernetic Immortality: A Report on the First Principia Cybernetica Workshop*, Journal of Ideas, 2, # 2/3.

Turchin V. (1990): *Cybernetics and Philosophy*, in: The Cybernetics of Complex Systems, F. Geyer (ed.), (Intersystems, Salinas, California), pp. 61-74.

Turchin V. (1993): *On Cybernetic Epistemology*, Systems Research 10:1, pp. 3-28.

Turchin V. (1993): *The Cybernetic Ontology of Actions*, Kybernetes 22:2, pp. 10-30.

Turchin V. and Joslyn C. (1990): *The Cybernetic Manifesto*, Kybernetes 19:2-3, pp. 63-65.

In addition to those, the following papers, presented at a Symposium on the Principia Cybernetica Project, have been published in the Proceedings of the 13th Int. Congress of Cybernetics (Int. Association of Cybernetics, Namur, 1993).

Introduction (Heylighen F.), p. 507.

Jdanko A.V.: *On Fundamental Problems of the Principia Cybernetica Project*, p.514.

Umerez J., Etxeberria A. & Moreno A.: *Emergence and Functionality*, p. 519.

Glück R.: *The Requirement of Identical Variety*, p. 524.

Elohim J.L.: *Automation: a conscious human tool to rationally accomplish human aims in order to purposefully push ahead human evolution*, p. 534.

Carvallo M.E.: *Some Alternatives to the Representational Mind*, p. 539.

Maddock J. W.: *Modeling Human Relationships via Dialectical Ecology*, p. 544.

Conclusion (Heylighen F.), p.549.

6.3 Books

A first volume, to be completed in 1993, will be an edited collection of papers by invited authors, including the PCP editors, William T. Powers, Elan Moritz, Robert Glück & Andrei Klimov, Jon Umerez & Alvaro Moreno, Charles Francois, Len Troncale and Donald T. Campbell. This volume will appear as a special issue of *World Futures: the Journal of General Evolution*, published by Gordon and Breach, New York. Its theme is the Theory of Metasystem Transitions. A number of these ideas can already be found in a pre-PCP book:

Turchin V. (1977): *The Phenomenon of Science*, Columbia University Press, New York.

A second, more long-term project is to synthesize the different ideas that were developed separately, in the form of a real *Principia Cybernetica* monograph, authored by the PCP editorial board, and similar to the set of linked nodes existing on the PCP-Web. A provisional outline includes the topics below. It is similar to the structure of the hypertext network on our World-Wide Web server.

INTRODUCTION

PCP in context of intellectual history;

PCP in systems and cybernetics.

WHAT ARE CYBERNETICS AND SYSTEMS SCIENCE?

Systems concepts;

Cybernetic principles (including semantic and anticipatory control, and metasystem transitions).

WHAT IS PHILOSOPHY?

Metaphysics;

Epistemology;

Ethics.

EVOLUTION

History of evolution: life, multicellular organisms, movement, irritability, complex reflexes, associating, human intelligence;

Future of evolution: immortality, super beings, social integration.

THE PRINCIPIA CYBERNETICA PHILOSOPHY

Meta-foundationalism;

PCP metaphysics;

PCP epistemology;

PCP ethics: ultimate human values, continuance of evolution, four types of immortality.

SYSTEM ARCHITECTURE

Syntactic: hypermedia, markup standards;

Semantic: link and node types.

7 Other PCP activities

PCP regularly organizes conferences or meetings. Until now there have been:

1. A Symposium on *Cybernetics and Human Values* at the 8th World Congress of Systems and Cybernetics (New York, June 1990).
2. *The 1st Workshop of the Principia Cybernetica Project* (Free University of Brussels, July 1991).
3. A Symposium on *The Principia Cybernetica Project* at the 13th Int. Congress on Cybernetics (Namur, August 1992).
4. A Symposium on *Cybernetic Principles of Knowledge Development* (in collaboration with Stuart Umpleby) is planned for the 12th European Meeting on Cybernetics and Systems Research (Vienna, April 1994).

The meetings allow researchers potentially interested in contributing the Project to meet in a relaxed atmosphere. The emphasis is on discussion, rather than on formal presentation. Contributors are encouraged to read some of the available texts on the PCP in order to get acquainted with the main issues.

PCP also publishes a *Principia Cybernetica Newsletter*, which is freely sent by postal or electronic mail to all people who ask to be on our mailing list. There have been two issues to date (0 and 1). The Newsletter appears irregularly, and summarizes the main developments (meetings, publications, theoretical developments, practical issues). It is edited by Francis Heylighen.

8 Collaborators Needed

We are still looking for people to work with us in a variety of capacities, including contributors, reviewers, readers, and general source-people.

We would also appreciate help with the administration: sending out mail, editing and printing newsletters and documents, connecting different communication channels (e.g. translating printed or faxed text to electronic texts). If you would dispose of secretarial or technical facilities, or have the time to help, please contact us. We are in particular looking for people with experience in hypermedia and computer-supported collaborative work environments, who might help us in choosing or developing the right tools. If you feel a strong resonance with Principia Cybernetica and the views we are expressing, we would also be very interested in talking about involvement at deeper levels.

If you wish to contribute in any way, please contact one of the editors below. We would appreciate that in your note you would give a short overview of your current interests and how they relate to Principia Cybernetica. More specific proposals about how you might contribute would be helpful.

9 Editorial Board

The Principia Cybernetica project is managed by a Board of Editors. The Board is responsible for the collection and development of the material, and for the implementation of the computer system. All inquiries or proposals about PCP should be directed to one of the editors below:

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