

Is Freud's model of the mind autopoietic?

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[67] The concept of "autopoiesis" was developed as a distinction made by an observer for characterizing systems in the world. The criteria for calling something autopoietic, developed by Maturana and Varela, have been expanded in varying ways by authors in different fields (Mingers). But in general, autopoietic systems are characterized by two main features:

- (1) they construct an identifiable boundary between themselves and their environment
- (2) they produce themselves; that is: every state of the system derives from a previous state of the system.

These two features taken together imply that the system is separate from the environment. Separation does not rule out interaction with the environment; but it does specify the nature of the interactions: there are no inputs and outputs proper, rather structural couplings with the environment, which are produced by the system itself (Maturana and Varela 42, 80-81).

Michael Heidelberger has suggested that modern systems theory derives from two main ideas:

- (1) the cognitive system is self-referential
- (2) living organisms are self-organizing

These two criteria can be assimilated to the two above: self-referentiality implies that the system acts according to prior states of the system, not by forces from outside. Similarly, self-organization means that the combination of information from within the system and the previous state of the system, rather than a structure imposed from outside, determine the development of the system in the next instance, i.e., the system's next step in continuing self-production.

Heidelberger suggests that the idea of self-organization derives from the *Naturphilosophie* tradition which developed in nineteenth-century Germany in the wake of Kant and Schelling, while the idea of cognitive self-referentiality derives from the gradual establishment by experiment that all the "inputs" from sensory nerves are qualitatively the same. Heidelberger goes on to state that no nineteenth-century thinker combined these two ideas in the form that systems theory did later. Both of these strands of nineteenth-century science are present in Freud's work, however.

[68] I suggest here that Freud's model of the mind comes very close to a systems-theory model, but differs from it in interesting and important ways. I treat only Freud's last model of the mind, as developed in "Jenseits des Lustprinzips" (1920) and

"Das Ich und das Es" (1923), and elaborated further in "Die Zerlegung der psychischen Persönlichkeit (lecture 31 of the *Neue Vorlesungen*) and the "Abriss der Psychoanalyse" (1938).

Although the concept of autopoiesis has not been generally accepted in biology, the authors who do use it are relatively clear on what would count as an autopoietic system. On the one hand, cells clearly produce both the molecules which compose them and a membrane which forms a boundary between themselves and the environment. The membrane of lipids allows some molecules to pass from outside to inside and from inside to outside. (The concept of autopoiesis was first developed in order to differentiate cells as living systems from other catalytic processes.) On the other hand, one can assert that all living organisms, even multicellular ones, are also autopoietic, although on a different level; the individual cells then represent subsystems within the larger system.

On the biological level, the mind (or even the brain) may function as a system, but it is clearly not autopoietic. While one might assert that the cells of the brain are produced by other brain cells, the ontogenesis of the brain is clearly tied to that of the whole organism; nor can a brain survive by itself as a system. So if the mind is to be taken as autopoietic, its structure must occur on a super-biological level.

Freud is confident in asserting that the mind must work using some sort of "energy," although he admits ignorance of what kind of energy the mind uses ("Abriss" §1.4, p.86). Yet he feels empowered to treat the various components of the mind as "black boxes," as components whose inner (= biological) workings have not yet been discovered, but whose function in the mind as a whole (analyzed on a particular level) can be stated. In this sense, he can theorize after the fashion of modern researchers in Artificial Intelligence, who speak of "modules" of the mind without necessarily having a neurological account of how such modules work (e.g. Minsky). Thus we read such formulations as "Wie die Traumarbeit vor sich geht, hat sich das eine Mal das Unbewußte besser durchgesetzt, das andere Mal das Ich energischer gewehrt" (Abriß 29), where no account need be given of what "Energie" oder "Abwehr" means on the neurological level.

In his last model of the mind, Freud proposes several "qualities" of mental items (I use this vague word on purpose, for the exact nature of these "items" will become important later): unconscious vs. conscious is the most important polarity, but Freud then assimilates those items which are *potentially* conscious to the conscious quality, and assimilates both to the items present to sensory consciousness. In addition, there are three main psychic "spaces": the Ich, the Es, and the Über-Ich, which (as many commentators have noted) do not map easily onto the qualities. Nor should the Über-Ich be thought of as ultra-rational and therefore at the furthest remove from the Ich; on the contrary, parts of the Ich and the Über-Ich are themselves unconscious, so that the three "spaces" blur together. Freud uses a geographic metaphor to describe this (Zerlegung: 79-80)

[69] Ich imaginiere ein Land mit mannigfaltiger Bodengestaltung, Hügelland, Ebene, und Seenketten, mit gemischter Bevölkerung – es wohnen darin Deutsche, Magyaren, und Slowaken, die auch verschiedene Tätigkeiten betreiben. Nun könnte die Verteilung so sein, daß im Hügelland die Deutschen wohnen, die Viehzüchter sind, im Flachland die Magyaren, die Getreide und Wein bauen, an den Seen die Slowaken, die Fische fangen und Schilf flechten. Wenn diese Verteilung glatt und reinlich wäre, würde ein Wilson seine Freude an ihr haben; es wäre auch bequem für den Vortrag in der Geographiestunde. Es ist aber wahrscheinlich, daß Sie weniger Ordnung und mehr Vermengung finden, wenn Sie die Gegend bereisen. Deutsche, Magyaren und Slowaken leben überall durcheinander, im Hügelland gibt es auch Äcker, in der Ebene wird auch Vieh gehalten. Einiges ist natürlich so, wie Sie es erwartet haben, denn auf Bergen kann man keine Fische fangen, im Wasser wächst kein Wein. Ja, das Bild der Gegend, da Sie mitgebracht haben, mag im großen und ganzen zutreffend sein; im einzelnen werden Sie sich Abweichungen gefallen lassen.

Freud's geography class contents itself with identifying typological categories, stereotypes even. In the end it is not even clear whether all the Slovaks weave reeds. The images are folkloric, reminiscent more of the geography lessons of Freud's childhood era than of industrialized Europe, where Magyars, Slovaks, and Germans all migrated to the industrial suburbs of Vienna to serve the machines in halls owned and organized by capital investment. Where people have become proletarians, the employers need not be interested in the ancestral crafts; and folk traditions survive in woven baskets or recipes served on holidays.

I stress this point because the interchangeability of workers regarded purely as workers in the "labor force," subjected to the rhythm of machines rather than the rhythms of harvest or tide, would seem an image better suited to expressing the "modern" experimental result that everything that happens in the brain is "just" electrical energy travelling along neurons and across synapses.¹

There are other places where mental "items" are assimilated to people, as when Freud speaks of "Der Verkehr der beiden Systeme" (i.e. unconscious and conscious) in section six of "Das Unbewußte," where the "Inhalt des *Ubw*" is compared to "eine psychische Urbevölkerung." The multi-ethnic *Heimat* of Freud's analogy here, so easily assimilable to Austria-Hungary, is curiously atavistic, and no mention is made of the infrastructure connecting the regions or of the political relationships between and within the various communities. And this is important, because it is precisely the borders between the "spaces" which are interesting. Assimilating the "mental items" to individual people and their "qualities" to ethnicities places a particular construction on the process by which they move within the regions – and the notion of "Zensur" at the border. The analogy calls up terms and problems like "Dualsystem"

1. I do not wish to make an analysis of Freud's model rest entirely on the analysis of his language; but we have every right to examine Freud's analogies; as Freud admits (79), "Vergleiche entscheiden nichts, das ist wahr, aber sie können machen, daß man sich heimischer fühlt." Since the work of Lakoff and others (Lakoff and Johnson; Lakoff; Margolis; Lakoff and Turner; Lakoff), it has been clear that mental schemata influence the directions of thought.

and "Doppelmonarchie" and "Ausgleich," not to mention "Zollverein" and "Großdeutschland" and "Anschluß" and "ethnic cleansing."

Of course, when the boundaries of the "spaces" shift, Freud prefers another set of metaphors, setting "culture" against "nature." Thus, when Plato's metaphor of the charioteer (*Phaedrus*) is transformed into the Ich as rider and the Es as horse, the two are compared to the "populäre Redeweisen" of "Vernunft" und "Leidenschaften," including the possibility that the stronger horse leads [70] the weaker rider sometimes ("Zerlegung" 83). Here at least "nature" is provided with a will. Compare the famous last words of the same "lecture" (86):

Ihre Absicht [d.h. der therapeutischen Bemühung der Psychoanalyse] ist ja, das Ich zu stärken, es vom Über-Ich unabhängiger zu machen, sein Wahrnehmungsfeld zu erweitern und seine Organisation auszubauen, so daß es sich neue Stücke des Es aneignen kann. Wo Es war, soll Ich werden.

Es ist Kulturarbeit etwa wie die Trockenlegung der Zuydersee.

Here the "spatial" aspect of the spatial metaphor has entirely taken over, the sea figured as wasteland to be saved for civilization. (In the other analogy, we could at least presume that the Slovaks practice pisciculture.) Nowadays, as the great rivers of China or North America flood, we may better appreciate the value of wetlands to the greater economy.

The point I am making here is that metaphors map a structure in one domain onto another domain (to use a more "modern" spatial metaphore) (Fauconnier; Sweetser and Fauconnier). The schemas used for comparing two domains are already structured. Each of Freud's *concepts* includes a price; depending on how sympathetic we are to Freud, we can deconstruct him or infer that he built the price into the metaphor. The latter trend is exemplified by a brilliant recent attempt to tease out the similarities between systems theory and Freudian theory: Peter Fuchs's careful analysis of the structure of the Freudian unconscious. Responding to Derrida's analysis of the "Wunderblock" essay, Fuchs notes (64n177):

Derrida ... hat mithin recht, wenn er feststellt, daß die Figur der Verspätung das Problem der Zeitlosigkeit des Unbewußten anders zu stellen erlaubt. Die Lösung ergibt sich daraus, daß es für keinen zeitlichen Prozeß mehr erreichbar ist; es ist außer der Zeit, weil seine Beobachtung immer verspätet, immer nachträglich und nie originär ist. Im Gegensatz zu Derrida ... meine ich, daß Freud dies genau sagt und daß es keine Lücke zwischen seiner Intuition und seiner Begrifflichkeit gibt. Und anzumerken ist hier, wenn auch im Vorgriff, daß es ebendiese Verspätung ist, diese *différance*, in der die Idee der Autopoesis mit Freuds Theoremen zusammenläuft. Die Autopoesis kann nicht anders als in dieser seltsamen Metaphysik der Verschiebung, des Aufschubs, der Nachträglichkeit, der Verspätung gedacht werden.

Fuchs's analysis teases out the moments where Freud's model is most complex, where it turns back on itself, where the vexed concept of "Nachträglichkeit" differentiates Freud from therapists who try to force access to some actual originary memory of trauma.

Fuchs's analysis of the role of language in Freud's model is particularly good. Freud did not, in fact, always assert that everything conscious moves through language; in "Das Ich und das Es," emotions formed an exception (see Macmillan 488), as they do in section three of "Das Unbewußte." But Fuchs stresses the crucial point: all mental "representations" are convertible (69):

Es ist die Einheit des psychischen Systems, die durch die Funktion der Repräsentanz garantiert wird.... Die am Vorbild des Bewußtseins entwickelte Idee der Vorstellung [wird abgekoppelt] vom Moment der Aufmerksamkeit, des Bemerkens, [71] der Registratur. Auf diese Weise wird eine zwischen den Systemen des Psychischen funktionierende Konvertibilität gewonnen, ein Material, das sich über die Bandbreite des kompletten Systems erstreckt und ineinander verrechenbar ist. Gegen alle Alltagsevidenz, gegen die Tradition der Philosophie ebenfalls postuliert Freud die Möglichkeit, alle Akte des Seelischen, seien sie bewußt oder nicht bewußt, als Formen in einem Medium aufzufassen, die beschrieben werden können mit den Kategorien, die aus der Kenntnis bewußter Vorgänge stammen.

The capacity of "items" to move between the various "spaces" is related to their status as "representations" rather than some other kind of mental event. For Fuchs, this dependence on linguistic representation – and thus on secondary processes – signifies the Freudian truth that the unconscious is only ever indirectly accessible by processes of translation and *Nachträglichkeit* (notice the spatial metaphors in both of these words). Insofar as anything is "brought over," it is already *Vbw* and has undergone a process of transformation. But this metaphor is curious when reapplied to the metaphoric field of the geography class. If a Slovak moves to the hills to work as a stablehand, must he speak German? Would this *Gastarbeiter* existence be comparable to an item moving (say through the process of *Durcharbeiten*, in analysis) from *Ubw* to *W-Bw*? (The political problems of dual citizenship seem easy to solve in comparison with the theoretical problems here.)

Here Freud – as read by Fuchs – touches on one of the main problems of the Artificial Intelligence tradition (Cummins): the question of mental representations. That is, if "items" are said to circulate between "spaces," or "representations" to undergo "operations" (and to express the common problem in the vocabulary of Freud and AI is not to say that *all* problems of the two theories are common!): what sort of "items" or "representations" are they, that they somehow flow around, yet remain associated (enough) to some "bit of world" or "idea" (or *something!*) that we can identify them as still "referring" to the same thing (i.e. being the same item in the first place)?

Fuchs is right that Freud's version the "unconscious" is innovative. But it will help in addressing the problem of representations if we examine just how much heritage he brings with him into the "terra incognita" of his theory. Schopenhauer and Nietzsche, using traditional terms like "Will" in new ways, had already suggested that the psyche might have centers of volition and understanding which are not assimilable to or even accessible by the Reason. And we might also ask whether the assimila-

tion of unconscious events to conscious events goes against the grain of European philosophical history. If empirical philosophers thought that all ideas were built up from (and analyzable into) sense impressions, surely they did not mean that we were really aware of the building-up process, or all the sense-impressions themselves. But they assumed that the basic datum, the sense impression, could be studied by examining our "normal" (conscious) apprehension of a sense impression (to speak in the language of analytic philosophy, they thought that the basic building blocks of mental life were observation sentences).

[72] Freud's model depends on a *topos* with a long history in European philosophy: mental representations are both given and inscrutable. I will need to unpack this *topos* a bit further. First, it depends on the idea that there are mental representations, which are often thought of as pictures, and in the most common version of the "picture" *topos* we find an agency which "reads" or "sees" the "pictures." This model Dennett has referred to as the "Cartesian theater": but let's not be unfair to Descartes! Locke and Hume, and anyone who has any use for the idea of "sense data," have some version of this model. The data are supposedly immediately present to consciousness and incorrigible: the data can be misinterpreted (as in optical illusions), but they are incorrigibly present to consciousness. (It was the possibility of optical illusions which first suggested the idea of sense data). This is the "myth of the given" excoriated by Sellars, and Freud subscribes to it: "Bewußt sein ist zunächst ein rein deskriptiver Terminus, er sich auf die unmittelbarste und sicherste Wahrnehmung beruft," we learn in "Das Ich und das Es (240).

The inscrutability thesis (as I am calling it) further asserts that mental representations and representations of sense data are of a kind. In fact, it is impossible for the "agent" to distinguish between the input of a sense-organ (usually the eye is taken as the paradigm) and the stored representation of a datum that was previously introduced through the senses and is now stored in memory.

Now Freud's model of the mind depends heavily on the inscrutability thesis. This fact is brought out most clearly in the passages about the Ich, which is caught between "three masters": Außenwelt, Über-Ich, and Es (Zerlegung 84).

Thus in the "Abriss" (§1.4, p.84) we see the following passage:

Bewusste Vorgänge an der Peripherie des Ichs, alle anderen im Ich unbewusst, das wäre der einfachste Sachverhalt, den wir anzunehmen hätten. So mag es sich auch wirklich bei den Tieren verhalten, beim Menschen kommt eine Komplikation hinzu, durch welche auch innere Vorgänge im Ich die Qualität des Bewusstseins erwerben können. Dies ist das Werk der Sprachfunktion, die Inhalte des Ichs mit Erinnerungsresten der visuellen, besonders aber akustischen Wahrnehmungen in feste Verbindungen bringt. Von da ab kann die wahrnehmende Peripherie der Rindenschicht in weit grösserem Umfang auch von innen her erregt werden, innere Vorgänge wie Vorstellungsabläufe und Denkvorgänge können bewusst werden, und es

bedarf einer besonderen Vorrichtung, die zwischen beiden Möglichkeiten unterscheidet, der sogenannten *Realitätsprüfung*. Die Gleichstellung Wahrnehmung-Realität (Aussenwelt) ist hinfällig geworden. Irrtümer, die sich jetzt leicht ergeben, im Traum regelmässig, werden *Halluzinationen* genannt.

If one could not confuse sense data and mental representations, there would be no possibility of hallucinations and no need for *Realitätsprüfung*. Furthermore, Freud's dependence on memory and lack of vision-processing modules (Marr) lead him to assume that the content of hallucinations must come from memory traces, on the lines of *nihil in intellectu quod non prius in sensu fuit*. Note also that – as Fuchs suggests – the problem of inscrutability is related here to the Sprachfunktion. language somehow makes the traffic [*Verkehr*] between the mental provinces [73] possible and makes *Realitätsprüfung* – the immigration police of the mind – necessary, so that all the "items" can be subsumed under their proper categories.

But if the conscious mind is potentially flooded with refugees from the land of the representations, it is also threatened by immigrants from outside. Rather than regarding the organism as an active seeker of stimuli (which will help in finding food, shelter, mates, etc.) – an account which would make much more sense from an evolutionary perspective – Freud postulates the need for a shield protecting the organism against sensory overload. Thus in "Jenseits," arguing from a fictional "simplified" organism [*Bläschen*], he suggests (25):

Es wäre ... leicht denkbar, daß durch unausgesetzten Anprall der äußeren Reize an die Oberfläche des Bläschens dessen Substanz bis in eine gewisse Tiefe dauernd verändert wird, so daß ihr Erregungsvorgang anders abläuft als in tieferen Schichten. Es bildete sich so eine Rinde, die endlich durch die Reizwirkung so durchgebrannt ist, daß sie der Reizaufnahme die günstigsten Verhältnisse entgegenbringt und einer weiteren Modifikation nicht fähig ist.

The birth of consciousness through the development of a "skin" against sensory impressions is imagined like the "burn-in" that plagued older CRT monitors and led to the invention of screen-savers. (Thought experiment: discuss weaknesses in Freud's model by picturing the Ich as a CRT monitor.)

The "Abriss" remarks twice on the genesis of the Ich as a sort of mental INS:

Die andere psychische Instanz, die wir am besten zu kennen glauben und in der wir am ehesten uns selbst erkennen, das sogenannte *Ich*, hat sich aus der Rindenschicht des Es entwickelt, die durch ihre Einrichtung zur Reizaufnahme und Reizabhaltung in direktem Kontakt mit der Aussenwelt (der *Realität*) steht. Es hat von der bewussten Wahrnehmung her immer grössere Bezirke und tiefere Schichten des Es seinem Einfluss unterworfen, zeigt in seiner festgehaltenen Abhängigkeit von der Aussenwelt den unutilgbaren Stempel seiner Herkunft. (Etwa wie: made in Germany.) (§3.8, p.129; cf. §1.1, p.68)

In the last analogy, the Es is almost colonized by the Ich, with its foreign legions of sense-data and their effects in the mind.

The system *W-Bw* is thus not only "das äußerste oberflächliche Stück des seelischen Apparats," but also the place where the two "worlds" collide" (Zerlegung 81):

Dieses System ist der Außenwelt zugewendet, es vermittelt die Wahrnehmungen von ihr, in ihm entsteht während seiner Funktion das Phänomen des Bewußtseins. Es ist das Sinnesorgan des ganzen Apparats, empfänglich übrigens nicht nur für Erregungen, die von außen, sondern auch für solche, die aus dem Inneren des Seelenlebens herankommen. Die Auffassung bedarf kaum einer Rechtfertigung, daß das Ich jener Teil des Es ist, der durch die Nähe und den Einfluß der Außenwelt modifiziert wurde, zur Reizaufnahme und zum Reizschutz eingerichtet, vergleichbar der Rindenschicht, mit der sich ein Klümpchen lebender Substanz umgibt. Die Beziehung zur Außenwelt ist für das Ich entscheidend geworden, es hat die Aufgabe übernommen, sie bei dem Es zu vertreten, zum Heil des Es, das ohne Rücksicht auf diese übergewaltige Außenmacht im blinden Streben nach Triebbefriedigung der Vernichtung nicht entgehen würde. In der Erfüllung dieser [74] Funktion muß das Ich die Außenwelt beobachten, eine getreue Abbildung von ihr in den Erinnerungsspuren seiner Wahrnehmungen niederlegen, durch die Tätigkeit der Realitätsprüfung fernhalten, was an diesem Bild der Außenwelt Zutat aus inneren Erregungsquellen ist. Im Auftrag des Es beherrscht das Ich die Zugänge zur Motilität, aber es hat zwischen Bedürfnis und Handlung den Aufschub der Denkarbeit eingeschaltet, während dessen es die Erinnerungsreste der Erfahrung verwertet. Auf solche Weise hat es das Lustprinzip entthront, das uneingeschränkt den Ablauf der Vorgänge im Es beherrscht und es durch das Realitätsprinzip ersetzt, das mehr Sicherheit und größeren Erfolg verspricht.

It has to evaluate the two sets of representations – inner and outer – which must be comparable, but also marked by their origins so they can be compared. The sense data are converted into "traces," but treated as if they were somehow also primary. There are not enough modules in Freud's model, and the organism's role in sensing the world is made much too passive, as is the substance of memory. As subtle as the "Wunderblock" model of the mind is, it is still too close to Aristotle's wax tablet in this respect. And where cognitive science stresses the use of schemas in recall as well as in storage, Freud feels that the Es is "write-protected" (to use a more recent metaphor), and that this fact should be built into the theory more thoroughly (Zerlegung 81):

Ich habe immer wieder den Eindruck, daß wir aus dieser über jedem Zweifel feststehenden Tatsache der Unveränderlichkeit des Verdrängten durch die Zeit viel zu wenig für unsere Theorie gemacht haben.

Freud's formulation of his theory thus depends too much on the Cartesian heritage of sense data. The autopoietic account improves on his somewhat in pointing out that "sense data," or better put, the sorts of perturbations in the brain that are the result of

the interaction of certain neurons and certain specific environmental conditions, are as much a product of the body as of the world. The nerve cells in question are "designed" to interact with the environment in these, and not other, ways. "Designed" means: they are as they are because of natural selection, i.e. because of the history of previous animals that had similar cells which performed some function which allowed for a non-random advantage in procreation for the animals containing them, and who were the ancestors of the current animal – this is what Ruth Millikan calls a "Proper Function." Rather than picturing the world, such features "track" it. (I don't know who introduced this term). The analogy here is with something like a thermometer: thermometers are constructed such that a change in environmental temperature causes some sort of legible feature (a column of mercury, say) to change as well. The feature is legible to us, who are examining the object in question, but not to the object itself. It would be slightly odd to call the correspondence between index and environment a representation, unless one held perhaps that the entire state of the object was a representation. (This sort of view is sometimes held by philosophers interested in neural networks.) And it can be assimilated to the notion of "structural coupling" in systems theory.

If we start down this path, however, where do we get off? Not all interactions with the environment are the sort of structural couplings that can replace representations. Hence Millikan's notion of Proper Functions. The skin of human fingers, for instance, contains fascinating bodies called Pacinian corpuscles in the dermis, which consist of concentric layers of cells with a neuron at the core, whose Function is to "signal" pressure (Ewing 30-31). The Pacinian corpuscles "track" the environment, allowing human beings to respond to pressure on the fingers and perform useful functions like typing. Human skin also contains melanocytes, which turn darker with exposure to sun, and which sometimes occur in groups called moles. Exposure to ultraviolet radiation may cause moles to become cancerous (melanoma). Thus skin cancer also "tracks" the environment, in that the development of melanoma probably indicates previous exposure to UV radiation. But it is hard to see how melanoma can have carried a selective advantage, and been selected for; in this sense, it is not the Proper Function of moles to track exposure to radiation by becoming cancerous.

The lesson of this distinction is that coupling can have many effects, only some of which are Functions. Structural coupling that tracks the world may provide a substitute for the idea that sense data (or their representations) circulate among the modules of the mind like citizens across borders; neural networks in coupled systems may provide a substitute for atomistic mental "items"; organisms evolving structures coupled to the environment to elicit information on conditions in the neighborhood may replace skins sheltering the sensitive nervous system from the outside world. But now one needs an evolutionary account of couplings and their Proper Functions both within an organism's life and (as dispositions to promote certain couplings within an organism's life) across generations.

The new models also still have to account for the difficulties of coupling different sorts of couplings (circulating information between modules) or do without the concept of

information altogether. It is not clear that anything more abstract than molecules will be able to explain how modules interact; but if we can describe it all in terms of molecules, the description in terms of systems may prove expendible. Systems, famously, exist only in the distinction of the observer: are they also myths for our time?

In stressing the biological context of Freud's models, I follow "revisionist" analyses (Grünbaum; Sulloway). Patricia Kitcher's use of Freud as a warning for interdisciplinary programs (especially cognitive science) seems eminently applicable to systems theory. The biological shortcomings of Freud's theories are plain, but Freud's model of the mind (though grounded in biology at least in theory) works on a more abstract analytical level. This allows us a certain leeway in reading him. The two works of secondary literature I have cited illustrate two very different approaches to his work. Where Macmillan discusses Freud's argumentation and thereby questions the validity of his conclusions, Fuchs's book elucidates the structure of Freud's models. Macmillan reads like a scientist, Fuchs like a philosopher. Like Wittgenstein, Fuchs treats Freud's model as a myth (86-87). He can therefore afford to be much more sympathetic to Freud's models, since he takes them out of context and identifies the aspects which seem most striking and useful to "modern" theorizing (e.g. 41n41). I find Fuchs's method of reading congenial: like Macmillan, I think Freudian theory is scientific hogwash, but I agree with Fuchs that he is "einfach großartig" (35n20).

This "literary" sort of reading is probably also the proper way to approach systems theory (unless its debts to biology turn out to be sounder than those of Freud). It [76] can provide stimulating figures of thought, but should not be mistaken for a research program that can be tested against data. (It would do well, in fact, to figure out how its abstractions could be put into forms that would allow for interactions with experimental psychology and empirical sociology.) Otherwise, systems theory, too risks becoming merely a myth for our time. Nevertheless, even if it does not rise to the challenge of meeting experimental psychology and cognitive science – and this should be the lesson of Freud's texts – abstraction and lack of empirical confirmation do not necessarily result in a vacuous enterprise. Changing our vocabulary is something like changing our mind.

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