

# Cybernetics, Virtue Ethics and Design

## Working Paper

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## Introduction

In this paper I speak directly to the subject matter of this conference: to its theme of flourishing, and to the subject areas of systems thinking and design that this conference series as a whole seeks to bring together.

The conference theme of flourishing is a direct reference to ethics, and in particular the *Nicomachean Ethics* of Aristotle. There has been a revival of interest in this in recent decades under the heading of virtue ethics. Aristotle defined the good as that at which all things aim, and so in terms of goals and purpose. He described the goal of human life in terms *eudemonia*, which is usually translated as either human flourishing or the good life.

There is a clear connection between this conception of ethics in terms of purpose and both design and systems. Design is an explicitly purposeful activity, which can be understood as the attempt to devise “courses of action aimed at changing existing situations into preferred ones” (Simon, 1969/1996, p. 111). Purpose is of central concern for how we understand systems, most explicitly in cybernetics. The aim of this paper is to make explicit some of the deep interconnections between these three areas in terms of the theme of purpose, and to suggest areas of common concern where they might lend support to each other.

In order to do this within the scope of this paper, I focus on a specific point of reference in each of the three areas: to Alasdair MacIntyre’s (1981/1985) *After Virtue*, Dalibor Vesely’s (1985, 2004, 2010) account of architecture, and to the debate around Rosenblueth, Wiener and Bigelow’s (1943) proto-cybernetic paper.

## The failure of the enlightenment project of rationally justifying morality

MacIntyre begins *After Virtue* with a metaphoric account of a world in which science has suffered a cataclysm:

*Imagine that the natural sciences were to suffer the effects of a catastrophe. A series of environmental disasters are blamed by the general public on the scientists. Widespread riots occur, laboratories are burnt down, physicists are lynched, books and instruments are destroyed. Finally a Know-Nothing political movement takes power and successfully abolishes science teaching in schools and universities, imprisoning and executing the remaining scientists. Later still there is a reaction against this destructive movement and enlightened people seek to revive science, although they have largely forgotten what it was. But all they possess are fragments: a knowledge of experiments detached from any knowledge of the theoretical context which gave them significance; parts of theories unrelated either to the other bits and pieces of theory which they possess or to experiment; instruments whose use has been forgotten; half-chapters from books, single pages from articles...Adults argue with each other about the respective merits of relativity theory, evolutionary theory and phlogiston theory, although they possess only a very partial knowledge of each. Children learn by heart the surviving portions of the periodic table and recite as incantations some of the theorems of Euclid.*

(MacIntyre, 1981/1985, p. 1)

According to MacIntyre, something like this has happened in ethics over the last centuries. The enlightenment attempt to provide a rational basis for morality has resulted in the bifurcation of the social world into the realm of organization, in which ends are taken as given and not available for scrutiny, and the realm of the personal, in which debates over values are central but there is no available social resolution. We have fragments of theories but these are drawn from different cultures and there is no coherence as to how they relate. Debates remain unresolvable and our moral reasoning tends to take the form of assertion and counter assertion.

For MacIntyre, the failure of the enlightenment project to rationally justify morality was inevitable, not because ethics necessarily involves arbitrariness but because of the specific culture in which this project was carried out, and its conception of what would count as rational. This involved both the adoption of scientific forms of language, which were descriptive and excluded notions of purpose, and the simultaneous fragmentation of religious and scholastic traditions.

This process has left us with an incomplete moral scheme. We have an analysis of ourselves as we are now, and various moral precepts and rules, but without any idea of our goal or *telos*—*eudemonia*, the good life, or human flourishing.

## Architecture and the end of the cosmological tradition

There are parallels between the enlightenment's legacy in ethics, as described by MacIntyre, and its affect on the design discipline of architecture, as described by Dalibor Vesely. The enlightenment saw the dissipation of architecture's cosmological tradition, and attempts to design architecture rationally in various ways, such as the use of history as a reference point:

*The transformation of cosmological into astronomical thinking, where the unity of celestial and terrestrial phenomena was reduced to a narrow domain of celestial mechanics (astrophysics), lost its ability to serve as a reference for the phenomena on earth, where architecture itself is situated. The loss of cosmological reference was gradually replaced by*

*reference to history, focused primarily on the question of origins (from Solomon's temple to the primitive hut). The foundational role of classical orders was replaced by historical precedents, genealogies, character and finally by style. (Fischer von Erlach, Boffrand, J.F. Blondel, et al.) The reference to history was inevitably more relative than cosmology. This led to the well known historical arbitrariness of the 19c and as a result to a search for a new objectivity of architectural principles and order.*

(Vesely, 2010, p. 4)

Vesely describes this as leading to what he characterizes as our “age of divided representation” (Vesely, 2004), a split between technical rationality on the one hand and personal visions on the other, much as in MacIntyre's account.

This split between the rational/ objective and the aesthetic/ subjective runs deep in our culture. Yet, as Vesely points out, these two poles are not in opposition, as we often assume, but part of the same problematic settlement:

*Science, technology and aesthetics belong together. The development of scientific objectivity depends, as we have already seen, on the role of the subject responsible for the project of science. In other words, the more objective reality becomes, the more subjective must be the position of man, because in modern science he encounters by definition, as it were, only his own projection of reality. In conclusion, it is possible to say that objectivity in science is in fact the product of the subjectivity of man.*

(Vesely, 1985, p. 26)

Vesely and others, such as Christian Norberg-Schulz (1971, 1980) whose name is on the door of the room in which I am speaking, have attempted to heal this divide using phenomenology—to recover an understanding of the cosmological structure of space in a way that is accessible in the present. This position, however, has been in retreat in recent years within architectural discourse.

## **Cybernetics and the reintroduction of purpose into scientific discourse**

MacIntyre and Vesely describe similar historical processes: the attempt to replace traditional forms of enquiry with rational justification; the failure of this to provide a stable point of reference; and a resulting split between the rational and personal. In each of their accounts we might see the development of modern science as the villain of the piece, with its rejection of final causes in favour of a linear and mechanistic account of causality. It was this linear causality that risked obfuscating what was special about design in the design methods movement (Gedenryd, 1998).

Yet, this linear causality can be understood as also limiting the scope of science. It is in conflict with many contemporary developments, such as the study of complexity or emergence and the convergence between science and design that has taken place in recent decades (Jonas, 2014).

Cybernetics is notable for reintroducing purpose as a subject within scientific discourse, most notably in the proto-cybernetic paper of Arturo Rosenblueth, Norbert Wiener and Julian Bigelow (1943). Heinz von Foerster has summarised cybernetics in explicitly Aristotelian terms:

*...we are all cyberneticians (whether or not we call ourselves such) whenever we justify our actions without using the words “because of...,” or “à cause de...,” but with the phrase in English “in order to...,” which in French is much more Aristotelian, “à fin de...”*

(von Foerster, 1990/2003, p. 298)

Cybernetics bypasses problems with final causes occurring after the events they cause through its circular understanding of causality (Stewart, 1959/2000) and emphasises rather than hides the agency and purposes of the scientific observer.

## Internal and external goals

As Rosenblueth et al. (1943) showed, the circularity of a cybernetic system allows a purpose to be pursued. Rosenblueth et al. defined purpose as follows:

*The term purposeful is meant to denote that the act or behaviour may be interpreted as directed to the attainment of a goal—i.e., to a final condition in which the behaving object reaches a definite correlation in time or in space with respect to another object or event.*

(Rosenblueth, et al., 1943, p. 18)

The eponymous example of cybernetics is steering a ship, a clearly goal directed activity. The goal, however, is not necessarily best understood as the port towards which the ship is heading. As Richard Taylor (1950) argues, Rosenblueth et al.'s conception of purpose as striving towards a definite final condition does not account for vague or unsuccessful activities that are still goal-directed although no goal exists, such as “a man groping about in the dark for matches which are not there, but which he erroneously believes to be near at hand” or how “the alchemist can seek the philosopher’s stone, the knight can seek the Holy Grail” (p. 329).

In these cases, and also in the case of the ship, we do not have to identify the goal of the system in terms of something external to it, such as the port. We can instead understand the goal as an internal quality of the system, that of being on course for the port—as a set of relations between steersman, sea, rudder and the direction in which the port is believed to lie.

This removes the problem of the end goal being ambiguous, unknown or absent, such as in the examples Taylor cites. It also removes the risk that cybernetics’ understanding of teleology is interpreted in a deterministic way—the maintenance of the internal goal of being on course allows the steersman not just to continue his or her journey to a port but also to change course and to explore as yet unknown destinations. This is the sense in which Gordon Pask speaks of machines with “underspecified goals” (Bateson, 1972/2005); in which design is a cybernetic activity, oriented towards the new (Glanville, 2007; Sweeting, 2016a); and in which Andrew Pickering (2010) characterises cybernetics as a form of forward looking search. It follows that homeostasis, the process of

maintaining a goal state, does not necessarily imply the status quo. The maintenance of the internal goals of a system is a requirement for it being able to change its external goals.

Internal goals (or goods) are central to the positive part of MacIntyre's account, where he tries to recover something of the Aristotelian conception of ethics:

*Consider the example of a highly intelligent seven-year-old child whom I wish to teach to play chess, although the child has no particular desire to learn the game. The child does however have a very strong desire for candy and little chance of obtaining it. I therefore tell the child that if the child will play chess with me once a week I will give the child 50 cents worth of candy; moreover I tell the child that will always play in such a way that it will be difficult, but not impossible, for the child to win and that, if the child wins, the child will receive an extra 50 cents worth of candy. Thus motivated the child plays and plays to win. Notice however that, so long as it is the candy alone which provides the child with a good reason for playing chess, the child has no reason not to cheat and every reason to cheat, provided he or she can do so successfully. But, so we may hope, there will come a time when the child will find in those goods specific to chess, in the achievement of a certain highly particular kind of analytical skill, strategic imagination and competitive intensity, a new set of reasons, reasons now not just for winning on a particular occasion, but for trying to excel in whatever way the game of chess demands.*

(MacIntyre, 1981/1985, p. 188)

The contrast between external and internal goods is not an either/ or choice, and external goods can follow from the pursuit of internal ones. However, it is a problem when external goals dominate internal ones. If our actions are motivated only by goods external to them, potentially any means can be justified. This includes such obvious external goals as wealth, success or fame but also apparently benevolent goals where these are seen as external to the practice of seeking them, such as in consequentialist ethical frameworks.

MacIntyre's (1981/1985) project is to reconstruct the idea of the good life or human flourishing as a goal internal to our lives, drawing on social roles and practices that have internal goods. He describes the good life as a form of "quest" (p. 219) and goes on to define it self-referentially: "the good life for man is the life spent in seeking the good life for man"(p. 219).

The pursuit of internal goals is also central to design. Staying with the example of architecture, there is a significant difference between those buildings that have been designed and constructed with care for their qualities as pieces of architecture, such as their spatiality or craftsmanship, and those that have been built with a focus on external goals, such as profit. Moreover, designers cannot simply pursue fixed external goals when they are designing because they cannot exhaustively analyse the situation at the outset (Rittel & Webber, 1973). Rather, designers nurture the internal goals of design activity, revising the criteria and goals of the project as they do so. In this they are much like the steersman, adjusting his or her course to suit changes in the environment or to explore new possibilities not seen at the start of the journey.

## Conclusion

Cybernetics, design and virtue ethics are each concerned with similar questions regarding purpose and the relation of goals to the actions that pursue them. If we hold with the historical account I have sketched, drawing on MacIntyre and Vesely, then we might even say they are concerned with the same questions.

There are several ways in which these areas might usefully support or critique each other. For instance:

- MacIntyre's discussion of social practices, which is a central but underdeveloped part of his (1981/1985) account, may benefit from cybernetic discussions of internal and external goals (Sweeting, 2015).
- Although he does not frame it in these terms, Ranulph Glanville's (2004) account of cybernetics and ethics takes the form of a series of virtues that enable and cultivate cybernetic forms of practice, such as design.
- MacIntyre's (1981/1985) self-referential definition of the good life may find support in cybernetic understanding of circularity, recursion and reflexivity and in the ethical reflections of second-order cybernetics, where cybernetics is applied to itself (e.g. Glanville, 2004; Mead, 1968; Poerksen, 2011; Sweeting, 2016b; von Foerster, 1990/2003).
- Virtue ethics seems compatible with design (Jonas, 2006) in a way that consequentialism and deontology are not, given their dependence on forms of reasoning (such as predefined rules and optimisation) that clash with what is special about design. Cybernetics may be one way to develop this connection.

Developing these points of connection can help us understand how flourishing may be put forward as a goal, as has been proposed by many participants during this conference. For instance, whenever we speak about flourishing we must take care that we do not advocate it merely as an external goal—as something to be maximized by whatever means available.

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