BARCELONA SCHOOL OF MANAGEMENT

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Ethics and energy

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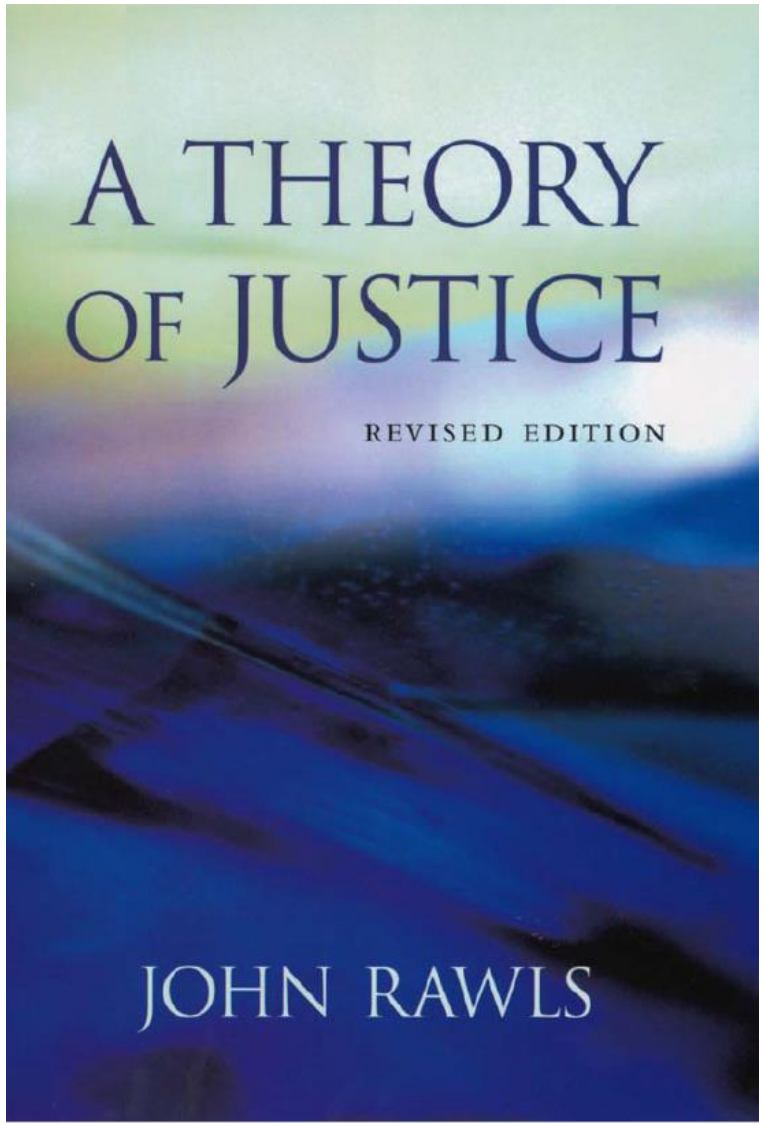
UNIVERSITÀ DI PISA

Ethics and energy

Do we need a philosopher
(or an economist or a scientist)
to know what we should do?

"Miss Dugan, will you send someone in here who can distinguish right from wrong?"



"**Let us assume that each person beyond a certain age and possessed of the requisite intellectual capacity develops a sense of justice under normal social circumstances**.

We acquire a skill in judging things to be just and unjust, and in supporting these judgments by reasons. Moreover, we ordinarily have some desire to act in accord with these pronouncements and expect a similar desire on the part of others.

Clearly **this moral capacity is extraordinarily complex. To see this it suffices to note the potentially infinite number and variety of judgments that we are prepared to make**. The fact that we often do not know what to say, and sometimes find our minds unsettled, does not detract from the complexity of the capacity we have."

"Now one may think of **moral theory** at first (and I stress the provisional nature of this view) **as the attempt to describe our moral capacity**; or, in the present case, one may regard a theory of justice as describing our sense of justice. **By such a description is not meant simply a list of the judgments** on institutions and actions that we are prepared to render, accompanied with supporting reasons when these are offered. Rather, **what is required is a formulation of a set of principles which, when conjoined to our beliefs and knowledge of the circumstances, would lead us to make these judgments** with their supporting reasons were we to apply these principles conscientiously and intelligently. A conception of justice characterizes our moral sensibility when the everyday judgments we do make are in accordance with its principles. These principles can serve as part of the premises of an argument which arrives at the matching judgments. We do not understand our sense of justice until we know in some systematic way covering a wide range of cases what these principles are."

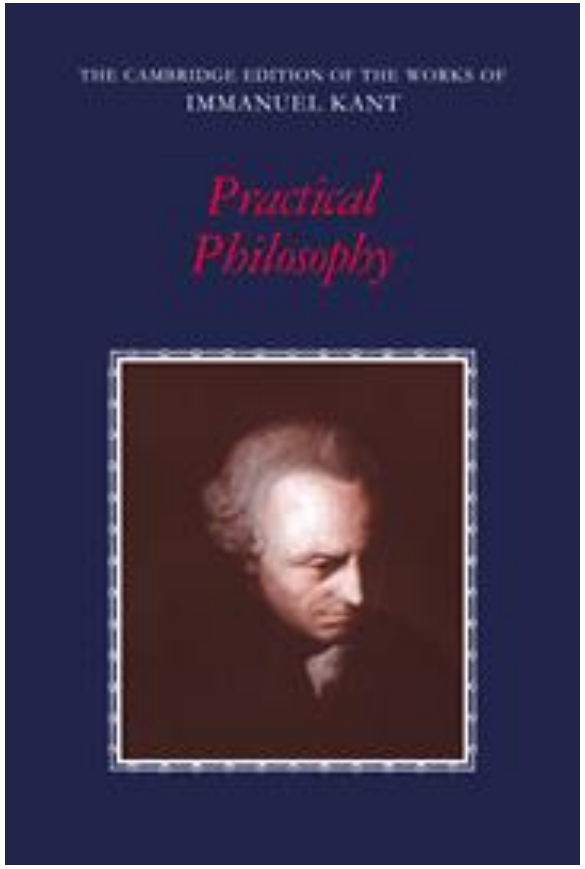
J. Rawls, *A Theory of Justice*, Revised Edition, Cambridge, Massachusetts, The Belknap Press of Harvard University Press, 1999.

"**A useful comparison here is with the problem of describing the sense of grammaticalness that we have for the sentences of our native language***. In this case the aim is to characterize the ability to recognize well-formed sentences by formulating clearly expressed principles which make the same discriminations as the native speaker. This undertaking is known to require theoretical constructions that far outrun the ad hoc precepts of our explicit grammatical knowledge. A similar situation presumably holds in moral theory. There is no reason to assume that our sense of justice can be adequately characterized by familiar common sense precepts, or derived from the more obvious learning principles. **A correct account of moral capacities will certainly involve principles and theoretical constructions which go much beyond the norms and standards cited in everyday life; it may eventually require fairly sophisticated mathematics as well**."

*See Noam Chomsky, *Aspects of the Theory of Syntax* (Cambridge, Mass., The M.I.T. Press, 1965), pp. 3–9.

J. Rawls, *A Theory of Justice*, Revised Edition, Cambridge, Massachusetts, The Belknap Press of Harvard University Press, 1999.

The moral cognition of common human reason



"Thus, then, we have arrived, within the moral cognition of common human reason, at its principle, which it admittedly does not think so abstractly in a universal form but which it actually has always before its eyes and uses as the norm for its appraisals. Here it would be easy to show how common human reason, with this compass in hand, knows very well how to distinguish in every case that comes up what is good and what is evil, what is in conformity with duty or contrary to duty, if, without in the least teaching it anything new, we only, as did Socrates, make it attentive to its own principle; and that **there is, accordingly, no need of science and philosophy to know what one has to do in order to be honest and good, and even wise and virtuous**. We might even have assumed in advance that cognizance of what it is incumbent upon everyone to do, and so also to know, would be the affair of every human being, even the most common"

I. Kant, *Groundwork of The metaphysics of morals*, 1785, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

“like the difference between the right and the left hand”

> “But if one asks: What, then, really is pure morality, by which as a touchstone one must test the moral content of every action? I must admit that only philosophers can make the decision of this question doubtful, for it is long since decided in common human reason, not indeed by abstract general formulae but by habitual use, like the difference between the right and the left hand”.

I. Kant, *Critique of practical reason*, 1788, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

A “fortunate simplicity”

“It then becomes even subtle, whether in quibbling tricks with its own conscience or with other claims regarding what is to be called right, or in sincerely wanting to determine the worth of actions for its own instruction; and, what is most admirable, in the latter case it can even have as good a hope of hitting the mark as any philosopher can promise himself; indeed, it is almost more sure in this matter, because a philosopher, though he cannot have any other principle than that of common understanding, can easily confuse his judgment by a mass of considerations foreign and irrelevant to the matter and deflect it from the straight course.

Would it not therefore be more advisable in moral matters to leave the judgment of common reason as it is and, at most, call in philosophy only to present the system of morals all the more completely and apprehensibly and to present its rules in a form more convenient for use (still more for disputation), but not to lead common human understanding, even in practical matters, away from its fortunate simplicity and to put it, by means of philosophy, on a new path of investigation and instruction?”

I. Kant, *Groundwork of The metaphysics of morals*, 1785, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

“innocence … is easily seduced”

“There is something splendid about innocence; but what is bad about it, in turn, is that it cannot protect itself very well and is easily seduced.
Because of this, even wisdom - which otherwise consists more in conduct than in knowledge - still needs science, not in order to learn from it but in order to provide access and durability for its precepts. The human being feels within himself a powerful counterweight to all the commands of duty, which reason represents to him as so deserving of the highest respect - the counterweight of his needs and inclinations, the entire satisfaction of which he sums up under the name happiness. Now reason issues its precepts unremittingly, without thereby promising anything to the inclinations, and so, as it were, with disregard and contempt for those claims, which are so impetuous and besides so apparently equitable (and refuse to be neutralized by any command). But from this there arises a **natural dialectic**, that is, a **propensity to rationalize against those strict laws of duty and to cast doubt upon their validity, or at least upon their purity and strictness, and, where possible, to make them better suited to our wishes and inclinations**, that is, to corrupt them at their basis and to destroy all their dignity - something that even common practical reason cannot, in the end, call good”.

I. Kant, *Groundwork of The metaphysics of morals*, 1785, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

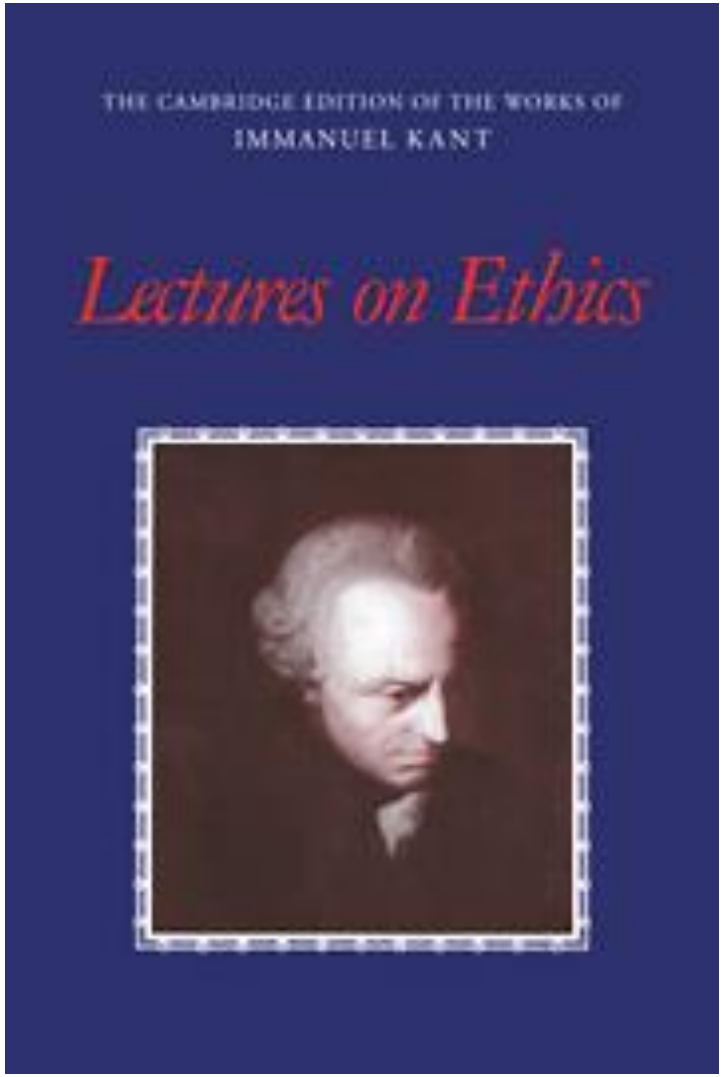
“Natural dialectic and the critique of pure reason”

“In this way common human reason is impelled, not by some need of speculation (which never touches it as long as it is content to be mere sound reason), but on practical grounds themselves, to go out of its sphere and to take a step into the field of practical philosophy, in order to obtain there information and distinct instruction regarding the source of its principle and the correct determination of this principle in comparison with maxims based on need and inclination, so that it may escape from its predicament about claims from both sides and not run the risk of being deprived of all genuine moral principles through the ambiguity into which it easily falls.

So there develops unnoticed in common practical reason as well, when it cultivates itself, a dialectic that constrains it to seek help in philosophy, just as happens in its theoretical use; and the first will, accordingly, find no more rest than the other except in a complete critique of our reason.”

I. Kant, *Groundwork of The metaphysics of morals*, 1785, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

Moral judgement and moral motivation ("virtue does not flirt")



"We first have to take up two points here:

(1) The **principle of appraisal of obligation**, and
(2) the **principle of its performance or execution**.

Guideline and motive have here to be distinguished. The guideline is the principle of appraisal, and the motive that of carrying-out the obligation; in that they have been confused, everything in morality has been erroneous.
If the question is: What is morally good or not?, that is the principle of appraisal, whereby I judge the goodness or depravity of actions. But if the question is: What moves me to live according to this law?, that is the principle of motive. Appraisal of the action is the objective ground, but not yet the subjective ground. That which impels me to do the thing, of which understanding tells me that I ought to do it, is the *motiva subjective moventia.* "

Moral judgment is not sufficient for action: "If I judge through the understanding that the action is morally good, a great deal more is required to do this action of which I have so judged"

"Both in this life, and in the next, happiness is at odds with morality".
"Virtue does not flirt or curry favour, but is honourable".

Moral order and natural orders

Letter from J. S. Beck to I. Kant, May 31, 1792
"In other words, can't there be activities that would be inconsistent with a natural order but that nevertheless are prescribed by the moral law? It is a merely problematical thought, but it has this truth as its basis: the strict necessity of the categorical imperative is in no way dependent on the possibility of the existence of a natural order. Yet it would be a mistake to account for the agreement of the two as accidental. "

Letter from I.Kant to J.S. Beck July, 1792
"As for the question, Can't there be actions that are incompatible with the existence of a natural order and that yet are prescribed by the moral law? I answer, Certainly! If you mean, a *definite order of nature*, for example, that of the present world. **A courtier, for instance, must recognize it as a duty always to be truthful, though he would not remain a courtier for long if he were**. But there is in that *typus* only the form of a *natural order in general*, that is, the compatibility of actions as events in accord with moral laws, and as [events] in accord with *natural laws*, too, but merely in terms of *their generality*, for this in no way concerns the special laws of any particular nature".

The logic of the *fait accompli* and small ethics

“Such systems exist or will exist and it is a question, in a way, to endorse them, by reminding us that principles must be respected, by stating precautions to be taken, and by suggesting an approach based on a risk assessment. This approach, which Marc Hunyadi describes as a "small ethic", is part of a larger logic of fait accompli, where everyone has increasingly limited freedom to choose not to possess or use certain objects, and which objects, and which gradually builds 'lifestyles imposed by no one in particular and to which everyone everyone adheres to.

Moreover, the self-evaluation questionnaires which are proposed by institutions or by private organisations, or the ad hoc committees that are set up, run the risk of ethics washing, by promoting an "ethical compliance" whose value and meaning may be questionable.”

Catherine Tessier, *Éthique et IA: analyse et discussion* in Olivier Boissier (ed.), *CNIA 2021: Conférence Nationale en Intelligence Artificielle* (2021) 22 https://hal-emse.ccsd.cnrs.fr/emse-03278442

This calls for the following remarks:

- **An object, a programme or a technique cannot be "ethical" in itself and cannot be called 'ethical'.** The adjective 'ethical' (by definition: which concerns morality) can only be associated to an approach, a deliberation, a reflection, a question, a principle, a value, etc.
- **Similarly, a conformity cannot be "ethical"** and it is not enough to say what one should or should not do. The conformity in question is a technical compliance with certain requirements, set out in a specification and verified, including possible compromises, by simulations, verification campaigns, certification processes.
- **The concept of "ethics by design", modelled on the concept of privacy by design" runs up against he first two remarks**. In particular, "ethics and rule of law by design" means: compliance with standards, explainability, testing and validation, which is not a priori a matter for ethical reflection.

Catherine Tessier, *Éthique et IA: analyse et discussion* in Olivier Boissier (ed.), *CNIA 2021: Conférence Nationale en Intelligence Artificielle* (2021) 22 https://hal-emse.ccsd.cnrs.fr/emse-03278442

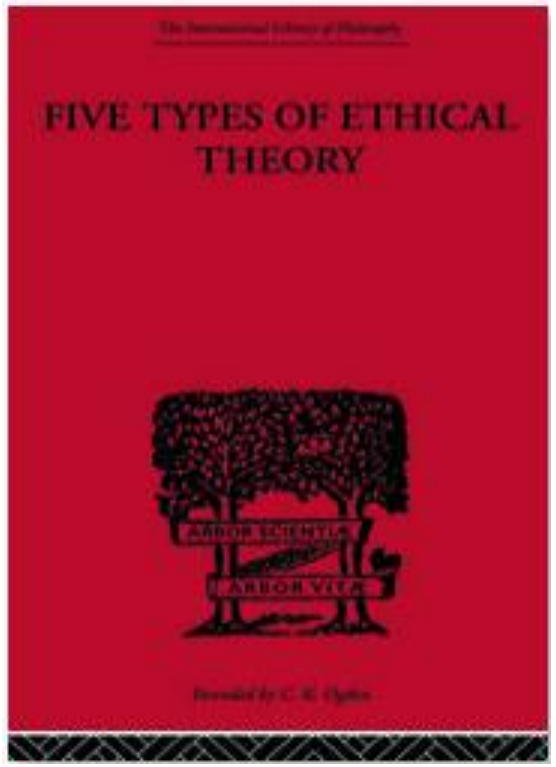
Normative ethics and metaethics

There are two levels of moral discourse:

1. **normative level**: normative ethical theories deal with what is right to do, the criterion(s) by which the morality of actions is to be judged
   - **Deontological theories**: the definition of what is right comes before that of what is good (absolute moral duties are given, duty for the sake of duty).
   - **Teleological theories**: right is the maximisation (or promotion) of a good (an end, a value); moral duties are justified only by considerations of the foreseeable effects of certain behaviour or of the practice of certain rules of action ('consequentialism' is the name given today to this position, whose representatives are the utilitarians).
   - Virtue ethics

2. **metanormative level**: philosophy of morality, metaethics, second-level investigation of morality.

Deontological and teleological ethical theories

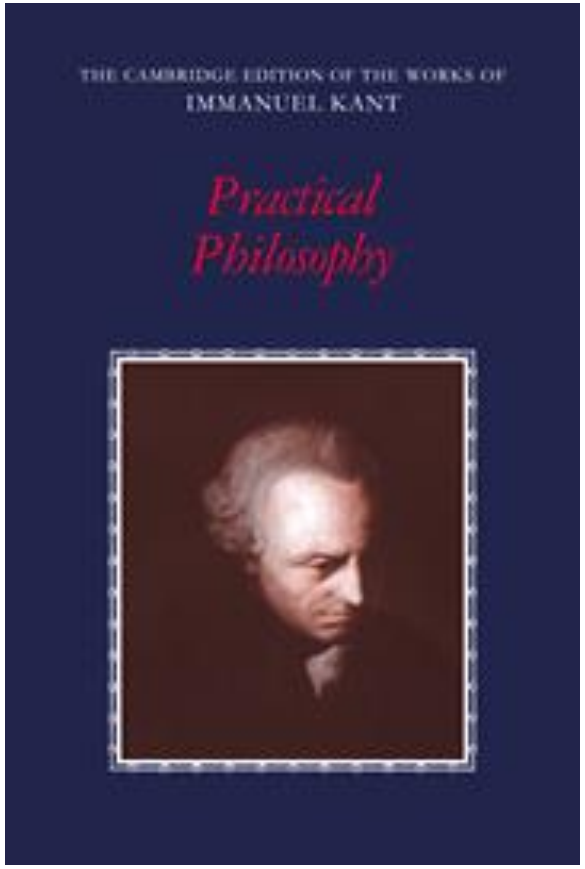


I would first divide ethical theories into two classes, which I will call respectively *deontological* and *teleological*.

Deontological theories hold that there are ethical propositions of the form: "Such and such a kind of action would always be right (or wrong) in such and such circumstances, no matter what its consequences might be." This division corresponds with Sidgwick's Intuitionism in the narrower sense. Teleological theories hold that the rightness or wrongness of an action is always determined by its tendency to produce certain consequences which are intrinsically good or bad. Hedonism is a form of teleological theory.

C.D. Broad, *Five Types Of Ethical Theory*, London 1944.

Hypothetical and categorical imperatives

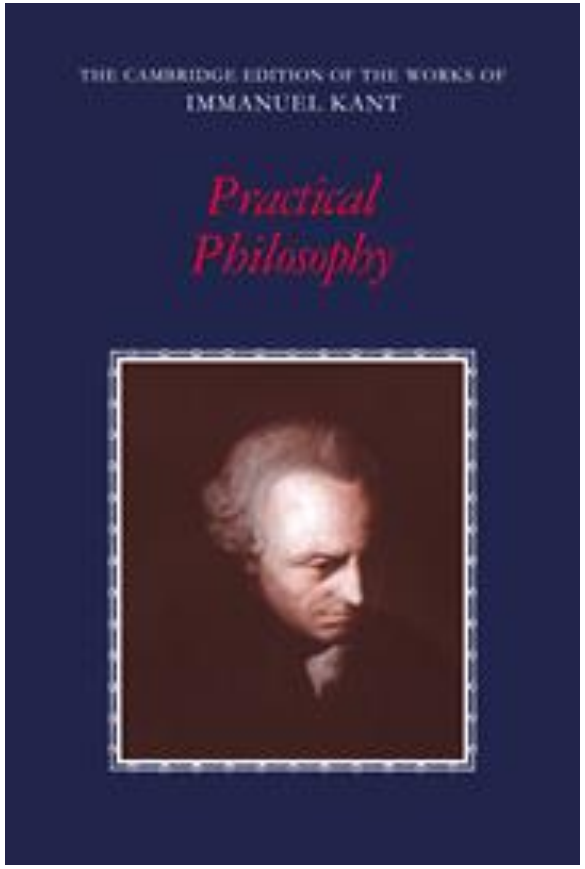


"all imperatives command either *hypothetically* or *categorically*. The former represent the practical necessity of a possible action as a means to achieving something else that one wills (or that it is at least possible for one to will). The categorical imperative would be that which represented an action as objectively necessary of itself, without reference to another end.
Since every practical law represents a possible action as good and thus as necessary for a subject practically determinable by reason, all imperatives are formulae for the determination of action that is necessary in accordance with the principle of a will which is good in some way. Now, if the action would be good merely as a means *to something else* the imperative is *hypothetical;* if the action is represented as *in itself* good, hence as necessary in a will in itself conforming to reason, as its principle, *then it is categorical.*"

Hypothetical imperatives: "If you want .... then you ought to..."
Categorical imperative: "You ought to...!"

I. Kant, *Groundwork of The metaphysics of morals*, 1785, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

Not merely a means



"I say that the human being and in general every rational being exists as an end in itself, not merely as a means to be used by this or that will at its discretion; instead he must in all his actions, whether directed to himself or also to other rational beings, always be regarded at the same time as an end. All objects of the inclinations have only a conditional worth; for, if there were not inclinations and the needs based on them, their object would be without worth. [...] Thus the worth of any object to be acquired by our action is always conditional. Beings the existence of which rests not on our will but on nature, if they are beings without reason, still have only a relative worth, as means, and are therefore called things, whereas rational beings are called persons because their nature already marks them out as and end in itself, that is, as something that may not be used merely as a means, and hence so far limits all choice (and is an object of respect)."

"all rational beings stand under the law that each of them is to treat himself and all others never merely as means but always at the same time as ends in themselves".

I. Kant, *Groundwork of The metaphysics of morals*, 1785, in *Practical Philosophy, The Cambridge Edition of the Works of Immanuel Kant*, ed. by M. Gregor, Cambridge, Cambridge University Press, 1996.

The trolley problem

"Suppose that a judge or magistrate is faced with rioters demanding that a culprit be found for a certain crime and threatening otherwise to take their own bloody revenge on a particular section of the community. The real culprit being unknown, the judge sees himself as able to prevent the bloodshed only by framing some innocent person and having him executed. Beside this example is placed another in which a pilot whose aeroplane is about to crash is deciding whether to steer from a more to a less inhabited area."

P. Foot, *The Problem of Abortion and the Doctrine of the Double Effect*, «Oxford Review», V, 1967, pp. 5-15.

“To make the parallel as close as possible it may rather be supposed that he is the driver of a runaway tram which he can only steer from one narrow track on to another; five men are working on one track and one man on the other; anyone on the track he enters is bound to be killed.

In the case of the riots the mob has five hostages, so that in both the exchange is supposed to be one man’s life for the lives of five.

The question is why we should say, without hesitation, that the driver should steer for the less occupied track, while most of us would be appalled at the idea that the innocent man could be framed.”

P. Foot, *The Problem of Abortion and the Doctrine of the Double Effect*, «Oxford Review», V, 1967, pp. 5-15.

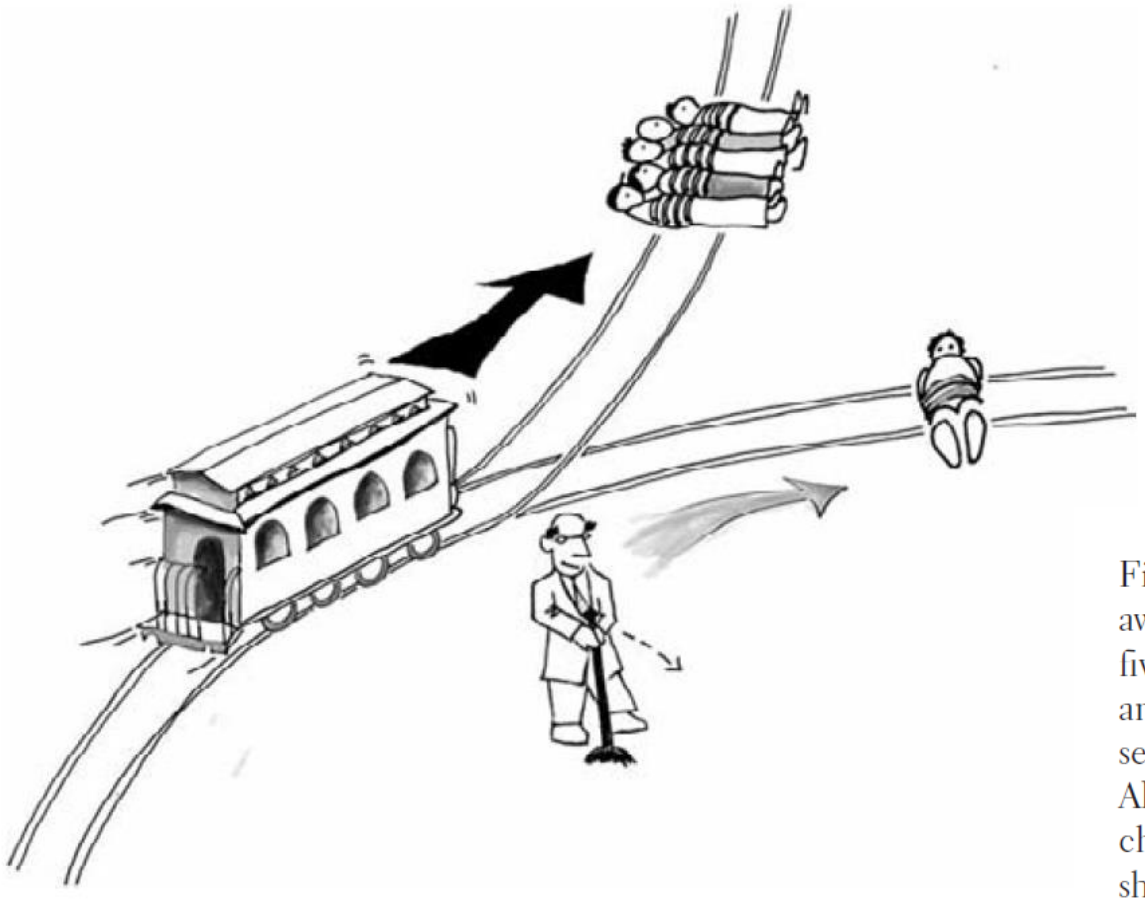


Figure 1. *Spur.* You're standing by the side of a track when you see a runaway train hurtling toward you: clearly the brakes have failed. Ahead are five people, tied to the track. If you do nothing, the five will be run over and killed. Luckily you are next to a signal switch: turning this switch will send the out-of-control train down a side track, a spur, just ahead of you. Alas, there's a snag: on the spur you spot one person tied to the track: changing direction will inevitably result in this person being killed. What should you do?

D. Edmonds, *Would you kill the fat man? The trolley problem and what your answer tells us about right and wrong*, Princeton University Press, 2014.

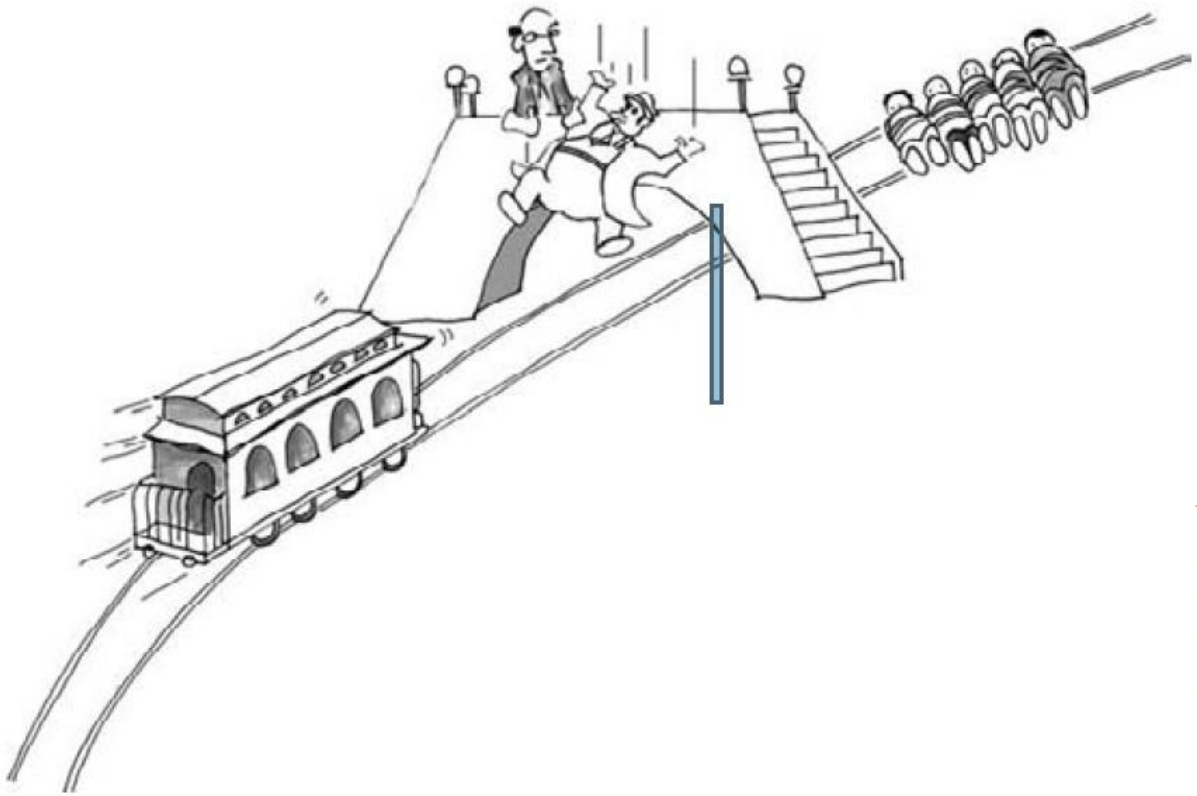


Figure 2. *Fat Man*. You're on a footbridge overlooking the railway track. You see the trolley hurtling along the track and, ahead of it, five people tied to the rails. Can these five be saved? Again, the moral philosopher has cunningly arranged matters so that they can be. There's a very fat man leaning over the railing watching the trolley. If you were to push him over the footbridge, he would tumble down and smash on to the track below. He's so obese that his bulk would bring the trolley to a shuddering halt. Sadly, the process would kill the fat man. But it would save the other five. Should you push the fat man?

D. Edmonds, *Would you kill the fat man? The trolley problem and what your answer tells us about right and wrong*, Princeton University Press, 2014.

The case of the scarce drug

"Another pair of examples poses a similar problem. We are about to give a patient who needs it to save his life a massive dose of a certain drug in short supply. There arrive, however, five other patients each of whom could be saved by one-fifth of that dose. We say with regret that we cannot spare our whole supply of the drug for a single patient, just as we should say that we could not spare the whole resources of a ward for one dangerously ill individual when ambulances arrive bringing in victims of a multiple crash. We feel bound to let one man die rather than many if that is our only choice.

The case of the body needed for medical purposes

Why then do we not feel justified in killing people in the interests of cancer research or to obtain, let us say, spare parts for grafting on to those who need them? We can suppose, similarly, that several dangerously ill people can be saved only if we kill a certain individual and make a serum from his dead body."

P. Foot, *The Problem of Abortion and the Doctrine of the Double Effect*, «Oxford Review», V, 1967, pp. 5-15.

The case of the tyrant (or of the mad murderer)

"Suppose for example that some tyrant should threaten to torture five men if we ourselves would not torture one. Would it be our duty to do so, supposing we believed him, because this would be no different from choosing to rescue five men from his torturers rather than one? If so, anyone who wants us to do something we think wrong has only to threaten that otherwise he himself will do something we think worse. A mad murderer, known to keep his promises, could thus make it our duty to kill some innocent citizen to prevent him from killing two."

P. Foot, *The Problem of Abortion and the Doctrine of the Double Effect*, «Oxford Review», V, 1967, pp. 5-15.

The case of the fat man stuck in the mouth of the cave

"To see how odd it would be to apply the principle like this we may consider the story, well known to philosophers, of the fat man stuck in the mouth of the cave. A party of potholers has imprudently allowed the fat man to lead them as they make their way out of the cave, and he gets stuck, trapping the others behind him. Obviously the right thing to do is to sit down and wait until the fat man grows thin; but philosophers have arranged that flood waters should be rising within the cave. Luckily (luckily?) the trapped party have with them a stick of dynamite with which they can blast the fat man out of the mouth of the cave. Either they use the dynamite or they drown. In one version the fat man, whose head is in the cave, will drown with them; in the other he will be rescued in due course. Problem: may they use the dynamite or not? Later we shall find parallels to this example. Here it is introduced for light relief and because it will serve to show how ridiculous one version of the doctrine of the double effect would be. For suppose that the trapped explorers were to argue that the death of the fat man might be taken as a merely foreseen consequence of the act of blowing him up. ('We didn't want to kill him … only to blow him into small pieces' or even '… only to blast him out of the cave.') I believe that those who use the doctrine of the double effect would rightly reject such a suggestion, though they will, of course, have considerable difficulty in explaining where the line is to be drawn".

P. Foot, *The Problem of Abortion and the Doctrine of the Double Effect*, «Oxford Review», V, 1967, pp. 5-15.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Tip for today:
Don't stand to close to utilitarians on a **trolley** overpass.

#trolleyday

The good place

https://piped.kavin.rocks/watch?v=DtRhrfhP5b4
https://piped.kavin.rocks/watch?v=-N_RZJUAQY4

Philippa Foot's solution of the trolley problem

"There is worked into our moral system a distinction between what we owe people in the form of aid and what we owe them in the way of non-interference".

"Let us speak of **negative duties** when thinking of the obligation to refrain from such things as killing or robbing, and of the **positive duty**, e.g., to look after children or aged parents. It will be useful, however, to extend the notion of positive duty beyond the range of things that are strictly called duties, bringing acts of charity under this heading."

It is interesting that, even where the strictest duty of positive aid exists, this still does not weigh as if a negative duty were involved. It is not, for instance, permissible to commit a murder to bring one's starving children food. If the choice is between inflicting injury on one or many there seems only one rational course of action.

If we are bringing aid (rescuing people about to be tortured by the tyrant), we must obviously rescue the larger rather than the smaller group. It does not follow, however, that we would be justified in inflicting the injury, or getting a third person to do so, in order to save the five. We may therefore refuse to be forced into acting by the threats of bad men. To refrain from inflicting injury ourselves is a stricter duty than to prevent other people from inflicting injury, which is not to say that the other is not a very strict duty indeed."

P. Foot, *The Problem of Abortion and the Doctrine of the Double Effect*, «Oxford Review», V, 1967, pp. 5-15.

What Has Posterity Ever Done for Us?

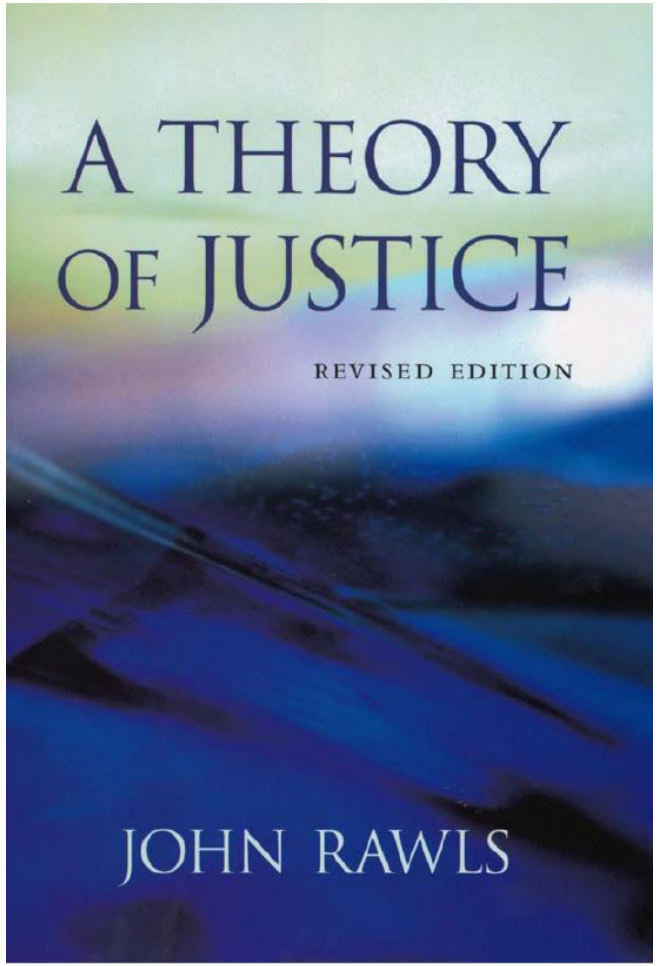
“There are many persons in the world, and there may possibly be some in this House, though I should be sorry to think so, who are not unwilling to ask themselves, in the words of the old jest, **“Why should we sacrifice anything for posterity; what has posterity done for us?”** They think that posterity has done nothing for them: but that is a great mistake.

[...] I have read of an eminent man—I am almost sure it was Dr. Franklin—who, when he wished to relieve the necessities or assist the occasions of any deserving person by pecuniary help, had a way of his own of doing it, and it was this. He said to them, "I only lend you this; if you are ever able, I expect you to repay it; but not to me: repay it to some other necessitous person, and do it under the same stipulation, that so the stream of benefits may still flow on, as long and as far as human honesty can keep it flowing."

[...] like the objects of Franklin's beneficence, we can indirectly repay it, by paying it to others—to those others whom also they cared for, and for whom, and not merely for us, their labours and sacrifices were undergone. What are we, Sir—we of this generation, or of any other generation, that we should usurp, and expend upon our particular and exclusive uses, what was meant for mankind? It is lent to us, Sir, not given: and it is our duty to pass it on, not merely undiminished, but with interest, to those who are in the same relation to us as we are to those who preceded us. So shall we too deserve, and may in our turn hope to receive, a share of the same gratitude.”

John Stuart Mill

1866 April 17, Hansard, United Kingdom Parliament, Commons, Malt Duty—Resolution, Speaking: Mr. John Stuart Mill (Westminster), Volume 182, cc1509-76, https://api.parliament.uk/historic-hansard/commons/1866/apr/17/malt-duty-resolution

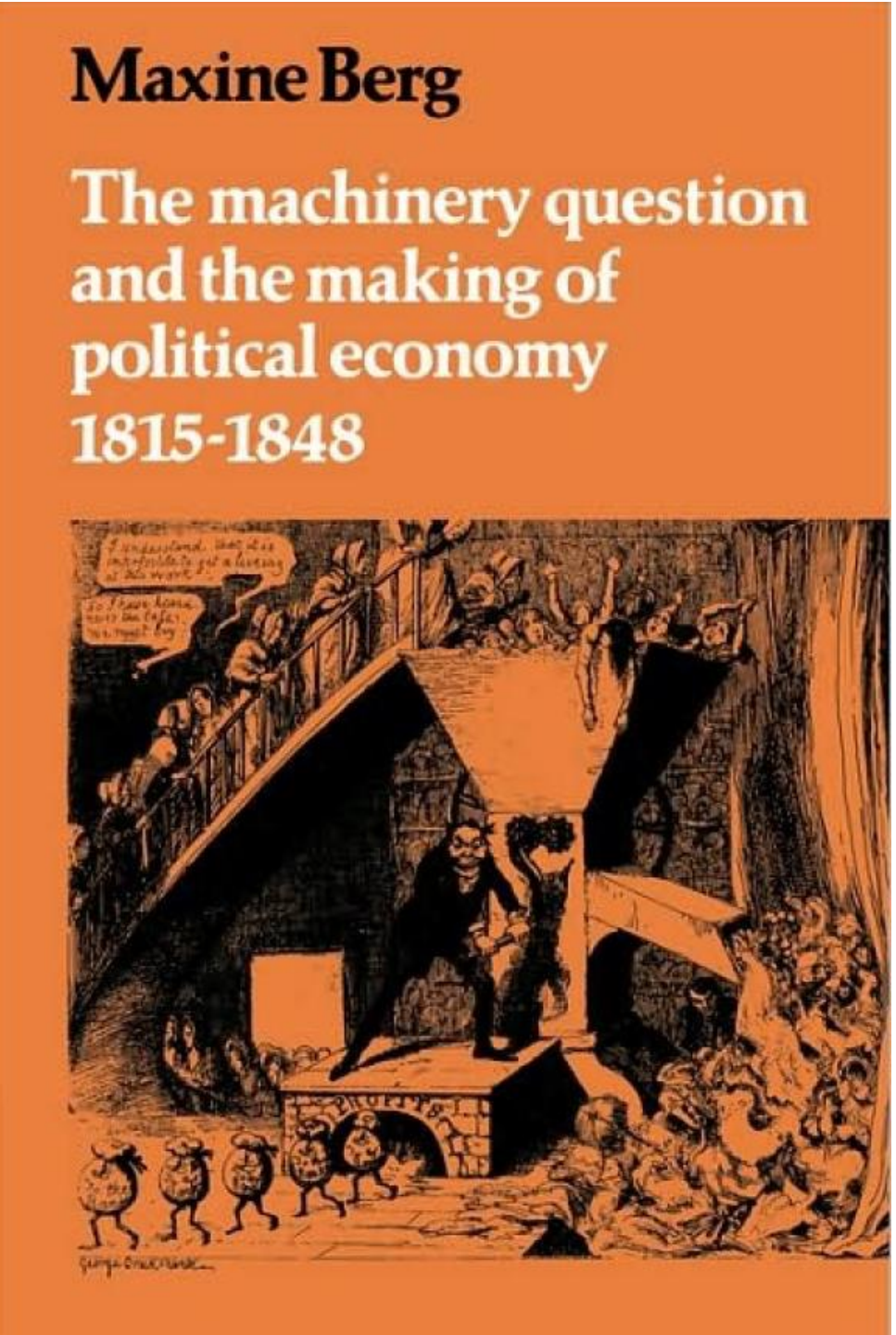


The original position: The idea is to set up a fair procedure so that any principles agreed to will be just. The aim is to use the notion of pure procedural justice as a basis of theory

The Veil of Ignorance: "Somehow we must nullify the effects of specific contingencies which put men at odds and tempt them to exploit social and natural circumstances to their own advantage. Now in order to do this I assume that the parties are situated behind a veil of ignorance. They do not know how the various alternatives will affect their own particular case and they are obliged to evaluate principles solely on the basis of general considerations.
It is assumed, then, that the parties do not know certain kinds of particular facts. First of all, **no one knows his place in society, his class position or social status; nor does he know his fortune in the distribution of natural assets and abilities, his intelligence and strength, and the like**. [...] More than this, I assume that the parties do not know the particular circumstances of their own society. That is, they do not know its economic or political situation, or the level of civilization and culture it has been able to achieve. **The persons in the original position have no information as to which generation they belong. These broader restrictions on knowledge are appropriate in part because questions of social justice arise between generations as well as within them, for example, the question of the [...] of the conservation of natural resources and the environment of nature. [...] in order to carry through the idea of the original position, the parties must not know the contingencies that set them in opposition. They must choose principles the consequences of which they are prepared to live with whatever generation they turn out to belong to**".

Ethics and energy

When did it start to make sense
to talk about 'ethics of energy'?

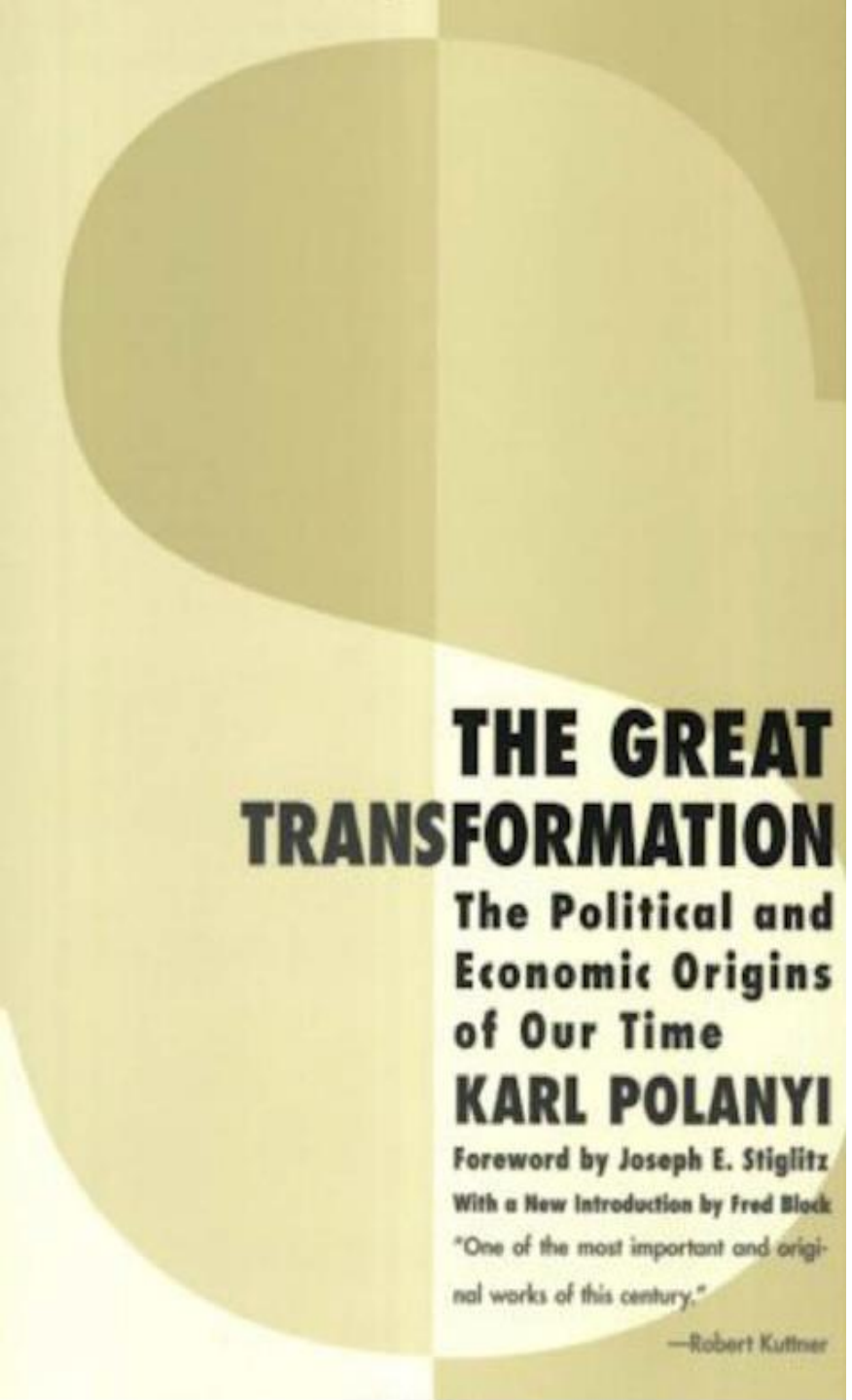


"In the eighteenth century there was no Machinery Question."

"But in the early nineteenth century this prospect of a harmonious integration of economic and social improvement was thrown into question. The face of industrialisation now appeared concentrated in the machine. It was the machine which seemed to be responsible for the disharmony of rapidly expanding cotton towns, unprecedented population growth and the economic crisis of the post-Napoleonic years. The eighteenth century vision of improvement had become the machinery question of the early nineteenth century."

"already manifest, and dwarfing in potential significance these other forms which technical change in an industry might take, was the ultimate, the most exciting and the most threatening development of all - the replacement of man by machine"

"coincidence of industrialisation with the beginnings of political economy."

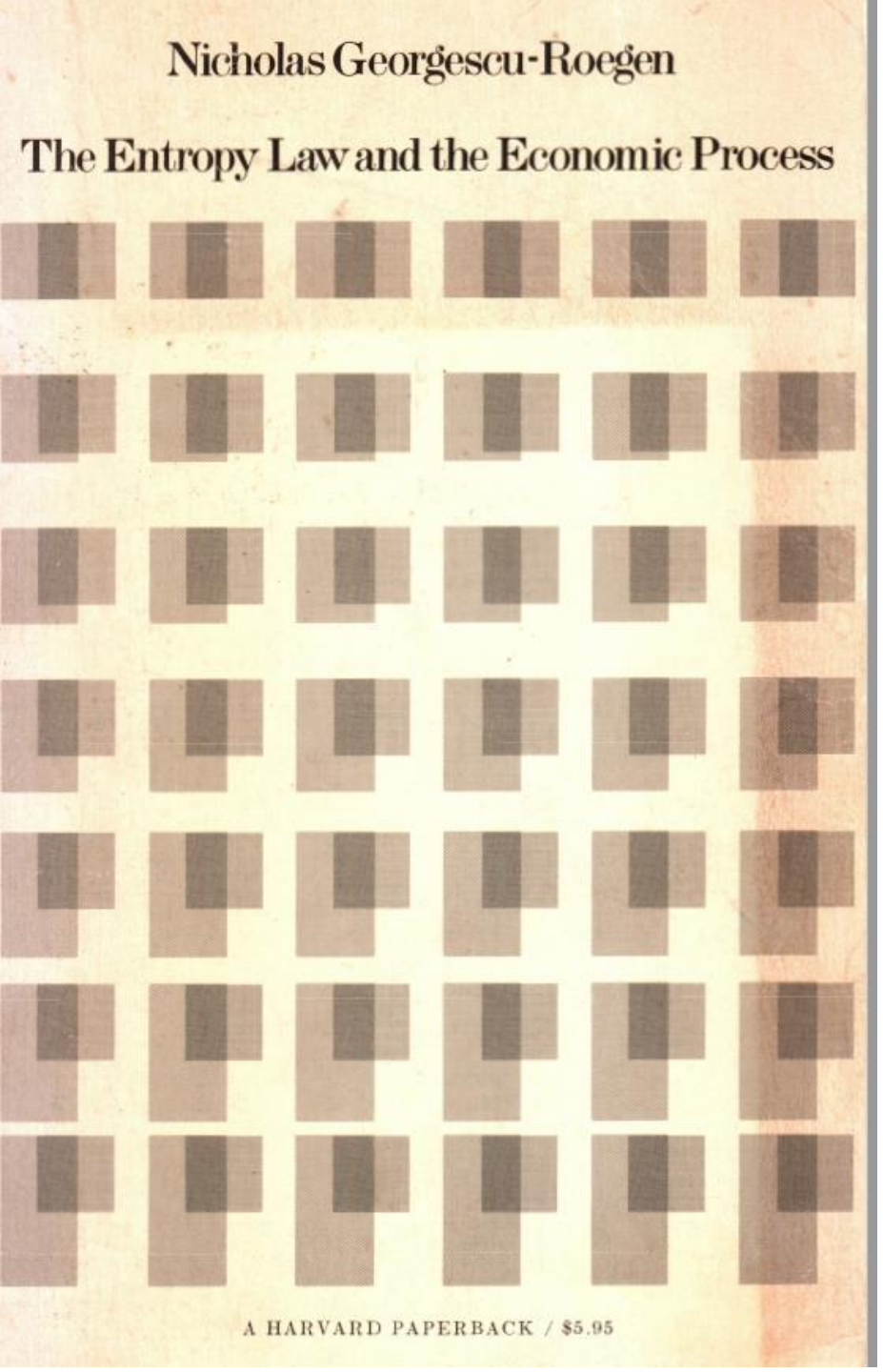


"**What we call land is an element of nature inextricably interwoven with man's institutions.** To isolate it and form a market for it was perhaps the weirdest of all the undertakings of our ancestors.

Traditionally, land and labor are not separated; labor forms part of life, land remains part of nature, life and nature form an articulate whole. Land is thus tied up with the organizations of kinship, neighborhood, craft, and creed-with tribe and temple, village, guild, and church. One Big Market, on the other hand, is an arrangement of economic life which includes markets for the factors of production. Since these factors happen to be indistinguishable from the elements of human institutions, man and nature, it can be readily seen that market economy involves a society the institutions of which are subordinated to the requirements of the market mechanism.

The proposition is as utopian in respect to land as in respect to labor. The economic function is but one of many vital functions of land. It invests man's life with stability; it is the site of his habitation; it is a condition of his physical safety; it is the landscape and the seasons. We might as well imagine his being born without hands and feet as carrying on his life without land. **And yet to separate land from man and to organize society in such a way as to satisfy the requirements of a real-estate market was a vital part of the utopian concept of a market economy.**

Again, it is in the field of modern colonization that the true significance of such a venture becomes manifest."



"It is fashionable now adays to indulge in estimating how large a population our earth can support. Some estimates are as low as five billions, others as high as forty-five billions.

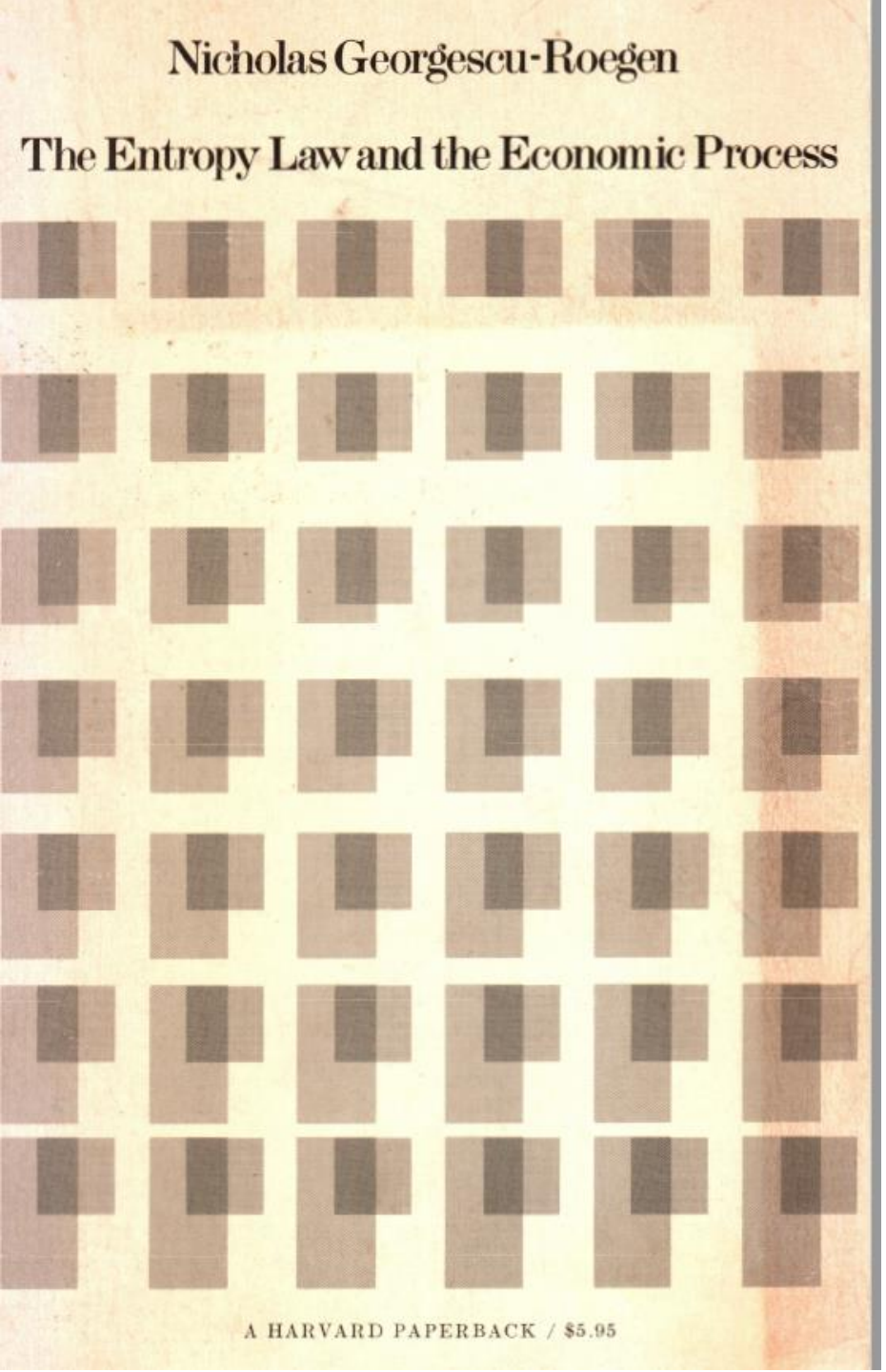
However, given the entropic nature of the economic process by which the human species maintains itself, this is not the proper way to look at the problem of population. Perhaps the earth can support even forty-five billion people, but certainly not ad infinitum.

We should therefore ask "how long can the earth maintain a population of forty-five billion people?"

And if the answer is, say, one thousand years, we still have to ask "what will happen thereafter?" All this shows that even the concept of optimum population conceived as an ecologically determined coordinate has only an artificial value."

"Man's natural dowry, as we all know', consists of two essentially distinct elements:

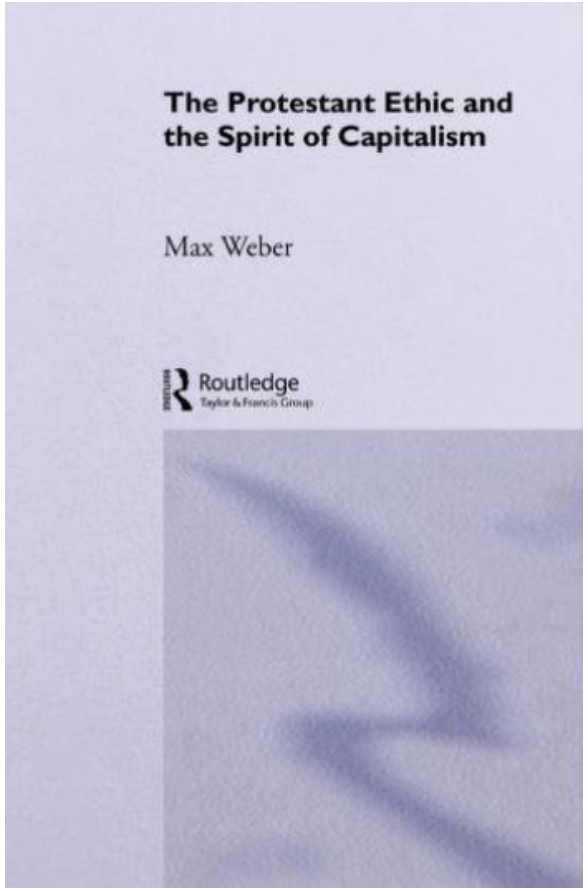
(1) the stock of low entropy on or within the globe, and
(2) the flow of solar energy, which slowly but steadily diminishes in intensity with the entropic degradation of the sun".



"It is again thermodynamics which explains why the things that are useful have also an economic value—not to be confused with price. For example, land, although it cannot be consumed, derives its economic value from two facts: first, land is the only net with which we can catch the most vital form of low entropy for us, and second, the size of the net is immutable. Other things are scarce in a sense that docs not apply to land, because, first, the amount of low entropy within our environment (at least) decreases continuously and irrevocably, and second, a given amount of low entropy can be used by us only once.

Clearly, both scarcities are at work in the economic process, but it is the last one that outweighs the other. For if it were possible, say, to bum the same piece of coal over and over again ad infinitum, or if any piece of metal lasted forever, then low entropy would belong to the same economic category as land. That is, it could have only a scarcity value and only after all environmental supply will have been brought under use. Then, every economic accumulation would be everlasting.".

“Until the last ton of fossilized coal is burnt”



“The Puritan wanted to work in a calling; we are forced to do so. For when asceticism was carried out of monastic cells into everyday life, and began to dominate worldly morality, it did its part in building the tremendous cosmos of the **modern economic order**. This order is **now bound to the technical and economic conditions of machine production which today determine the lives of all the individuals who are born into this mechanism**, not only those directly concerned with economic acquisition, **with irresistible force**. Perhaps it will so determine them until the last ton of fossilized coal is burnt. In Baxter’s view the care for external goods should only lie on the shoulders of the “saint like a light cloak, which can be thrown aside at any moment”. But fate decreed that the cloak should become an iron cage.”

Max Weber, *The Protestant Ethic and the Spirit of Capitalism*, Translated by T. Parsons, Routledge 2001, p. 123, https://archive.org/details/pdfy-8fnkKz0SleumNalz/page/n165 .

Science Advances
Volume 9, Issue 37
Sep 2023

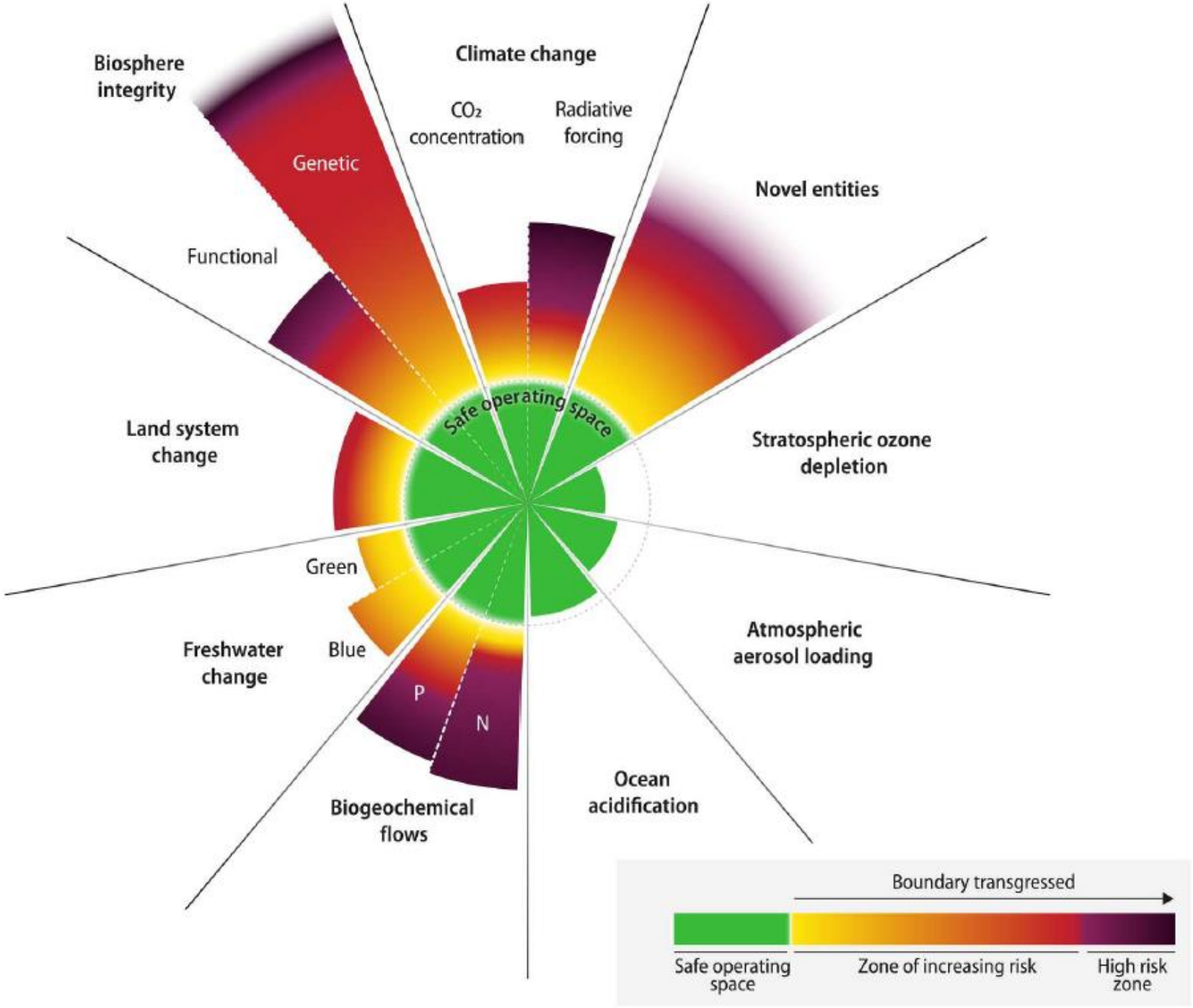
ARTICLE

Earth beyond six of nine planetary boundaries

Planetary Boundaries science update

"The planetary boundaries framework draws upon Earth system science. It identifies nine processes that are critical for maintaining the stability and resilience of Earth system as a whole. All are presently heavily perturbed by human activities."

"This planetary boundaries framework update finds that six of the nine boundaries are transgressed, suggesting that Earth is now well outside of the safe operating space for humanity".



ENCYCLICAL LETTER

LAUDATO SI'

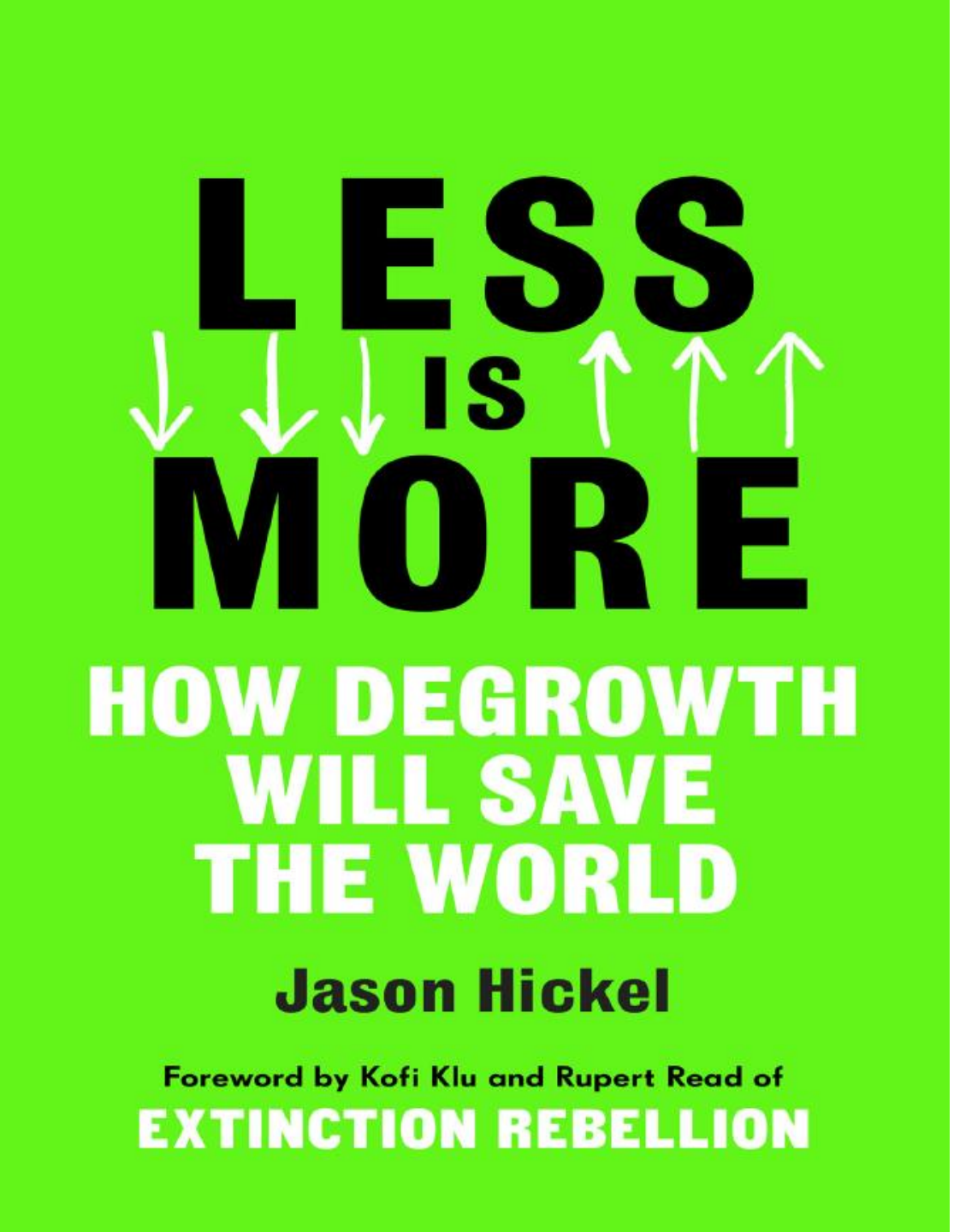
OF THE HOLY FATHER

FRANCIS

ON CARE FOR OUR COMMON HOME

165. We know that technology based on the use of highly polluting fossil fuels – especially coal, but also oil and, to a lesser degree, gas – needs to be progressively replaced without delay. Until greater progress is made in developing widely accessible sources of renewable energy, it is legitimate to choose the less harmful alternative or to find short-term solutions. But the international community has still not reached adequate agreements about the responsibility for paying the costs of this energy transition. In recent decades, environmental issues have given rise to considerable public debate and have elicited a variety of committed and generous civic responses. Politics and business have been slow to react in a way commensurate with the urgency of the challenges facing our world. Although the post-industrial period may well be remembered as one of the most irresponsible in history, nonetheless there is reason to hope that humanity at the dawn of the twenty-first century will be remembered for having generously shouldered its grave responsibilities.

https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html



"Under capitalism, global GDP needs to keep growing by at least 2% or 3% per year, which is the minimum necessary for large firms to make aggregate profits. That might seem like a small increment, but remember, it's an exponential curve, and exponential curves have a way of sneaking up on us with astonishing speed.

Three per cent growth means doubling the size of the global economy every twenty-three years, and then doubling it again from its already doubled state, and then again, and again.

This might be OK if GDP were just plucked out of thin air. But it's not. It is coupled to energy and resource use, and has been for the entire history of capitalism. There's a bit of give between the two, but not much.

As GDP grows, the global economy churns through more energy, resources and waste each year, to the point where it is now dramatically overshooting what scientists have defined as safe planetary boundaries, with devastating consequences for the living world."

“We know exactly what we need to do”

“But the ecological crisis is not being caused by everyone equally. This is a crucial point to grasp. […] low income countries, and indeed most countries in the global South, remain well within their fair share of planetary boundaries. In fact, in many cases they need to increase energy and resource use in order to meet human needs. It’s high-income countries that are the problem here, where growth has become completely unhinged from any concept of need, and has long been vastly in excess of what is required for human flourishing. Global ecological breakdown is being driven almost entirely by excess growth in high-income countries, and in particular by excess accumulation among the very rich, while the consequences hurt the global South, and the poor, disproportionately. Ultimately, this is a crisis of inequality as much as anything else.

We know exactly what we need to do in order to avert climate breakdown. We need to mobilise a rapid rollout of renewable energy – a global Green New Deal – to cut world emissions in half within a decade and get to zero before 2050. Keep in mind that this is a global average target. High-income nations, given their greater responsibility for historical emissions, need to do it much more quickly, reaching zero by 2030. It is impossible to overstate how dramatic this is; it is the single most challenging task that humanity has ever faced. The good news is that it is absolutely possible to achieve. But there’s a problem: scientists are clear that it cannot be done quickly enough to keep temperatures under 1.5°C, or even 2°C, if we keep growing the economy at the same time. Why?”

“Growthism”

“**Because more growth means more energy demand**, and more energy demand makes it all the more difficult – impossible, in fact – to roll out enough renewables to cover it in the short time we have left. Even if this wasn’t a problem, we must ask ourselves: once we have 100% clean energy, what are we going to do with it? Unless we change how our economy works, we’ll keep doing exactly what we are doing with fossil fuels: we’ll use it to power continued extraction and production, at an ever-increasing rate, placing ever-increasing pressure on the living world, because that’s what capitalism requires.

Clean energy might help deal with emissions, but it does nothing to reverse deforestation, overfishing, soil depletion and mass extinction. **A growth-obsessed economy powered by clean energy will still tip us into ecological disaster**.

The tricky part is that it seems we have little choice about this. **Capitalism is fundamentally dependent on growth**. If the economy doesn’t grow it collapses into recession: debts pile up, people lose their jobs and homes, lives shatter. Governments have to scramble to keep industrial activity growing in a perpetual bid to stave off crisis. So we’re trapped. Growth is a structural imperative – an iron law. And it has ironclad ideological support: politicians on the left and right may bicker about how to distribute the yields of growth, but when it comes to the pursuit of growth itself they are united. There is no daylight between them. Growthism, as we might call it, stands as one of the most hegemonic ideologies in modern history. Nobody stops to question it.”

“It’s not our technology that’s the problem. It’s growth”

“Some people try to reconcile this tension by leaning on the hope that technology will save us – that innovation will make growth ‘green’. Efficiency improvements will enable us to ‘decouple’ GDP from ecological impact so we can continue growing the global economy for ever without having to change anything about capitalism. And if this doesn’t work, we can always rely on giant geo-engineering schemes to rescue us in a pinch. It’s a comforting fantasy”.

“**‘green growth’ is not a thing. It has no empirical support.”**

“In an era of ecological emergency, we cannot afford to build policy around fantasies. Don’t get me wrong. Technology is absolutely essential in the fight against ecological breakdown. We need all the efficiency improvements we can get. But scientists are clear that they will not be enough, on their own, to fix the problem. Why? Because in a growth-oriented economy, efficiency improvements that could help us reduce our impact are harnessed instead to advance the objectives of growth – to pull ever-larger swathes of nature into circuits of extraction and production. It’s not our technology that’s the problem. It’s growth.”

Science, justice, and the structure of the economic system

"It is now well-established that green growth scenarios suffer from a difficult problem. They start with the assumption that the rich countries in the "core" of the world-system should continue to increase aggregate production and consumption ("growth") for the rest of the century.

But growth does not come out of thin air. It requires energy.

Rich countries already appropriate extremely high levels of energy—many times more than the rest of the world and vastly in excess of what would be required to provision good lives for all.

This high energy use is a problem, not only because it is driving climate breakdown and contributing to the crossing of other planetary boundaries but also because it makes sufficiently rapid decarbonization (that is, decarbonization consistent with fair shares of Paris-compliant carbon budgets) very difficult to achieve, even with optimistic assumptions about the speed of renewable energy deployment. To resolve this issue, **green growth scenarios resort to several deeply problematic assumptions**."

Jason Hickel *On Technology and Degrowth*, 2023, https://monthlyreview.org/2023/07/01/on-technology-and-degrowth/

Green growth scenarios resort to problematic assumptions

1. "they assume we can overshoot the Paris Agreement limits now and rely on mass deployment of speculative negative emissions technology in the future (mostly bioenergy with carbon capture and storage, or BECCS), to pull excess carbon out of the atmosphere. […] **BECCS would require vast tracts of land for biofuel monoculture, up to three times the size of India, appropriated overwhelmingly from the Global South, exacerbating deforestation, soil depletion, water depletion, biodiversity loss, and other ecosystem damages, while constraining food availability**. Relying on this approach is unjust and ecologically incoherent. It is also risky, because if, for whatever technological or political reasons, this scheme cannot be scaled in the future, then we will be locked into a high-temperature trajectory from which it will be impossible to escape.

2. A second major assumption in green growth scenarios is that efficiency improvements can be achieved to an extent that **radically decouples GDP from energy use**. The main problem here is that the assumed rates of decoupling are not supported in the empirical literature […]. Furthermore, empirical studies reveal that in a growth-oriented economy, **gains from efficiency improvements tend to be leveraged to expand processes of production and consumption.**"

Jason Hickel *On Technology and Degrowth*, 2023, https://monthlyreview.org/2023/07/01/on-technology-and-degrowth/

3. Finally, **green growth scenarios maintain high levels of energy use in high-income countries by constraining energy use, and therefore development, in the Global South—in some cases to levels that are below what is required for even basic needs**. This approach is obviously immoral and unjust (the term ecofascist comes to mind), and clearly unacceptable to Global South negotiators. It is worth noting here, furthermore, that achieving and maintaining a decarbonized economy for high-income countries with their existing levels of energy use (and automobile use) would require extraordinary levels of material extraction for all the energy infrastructure and batteries, most of which will be obtained from the Global South through supply chains that are already in many cases socially and ecologically destructive. Yes, we need renewable energy transition. But needlessly high energy use in rich countries means this transition will be slower and the social and ecological costs will be higher."

"Ecological economists point out that when we scale back our assumptions about technological change to levels that are, to quote the physicist and ecological economist Julia Steinberger, "non-insane," and when we reject the idea that growth in rich countries should be maintained at the expense of the Global South, it becomes clear that **relying on technological change is not enough, in and of itself, to solve the ecological crisis**. Yes, we need fast renewable energy deployment, efficiency improvements, and dissemination of advanced technology (induction stoves, efficient appliances, heat pumps, electric trains, and so on). But **we also need high-income countries dramatically to reduce aggregate energy and material use,** at a speed faster than what efficiency improvements alone could possibly hope to deliver. To achieve this, **high-income countries need to abandon growth as an objective** and actively scale down less necessary forms of production, to reduce excess energy and material use directly."

Jason Hickel *On Technology and Degrowth*, 2023, https://monthlyreview.org/2023/07/01/on-technology-and-degrowth/

Growth is not social progress

"This brings us to a critically important point. We must be clear about what growth actually is. It is not innovation, or social progress, or improvements in well-being. It is very narrowly defined as an increase in aggregate production, as measured in market prices (GDP). GDP makes no distinction between $100 worth of tear gas and $100 worth of health care. This metric is not intended to measure what is important for people, but rather what is important for capitalism. Of course, what is important for capitalism is not to meet human needs, or achieve social progress, but rather to maximize and accumulate capital. If social progress and well-being are our goal, it is not the market value of aggregate production that matters but rather what we are producing (tear gas or health care?), and whether people have access to essential goods and services (is the health care privatized or universal?)."

Under capitalism, essential goods are either underproduced (public transit) or commodified and priced out of reach of working-class households (housing, health care, higher education, and so on). This explains why even in rich countries, despite their high levels of aggregate production, many people cannot make ends meet. In the United States, a quarter of the population lives in substandard housing and nearly half cannot afford health care. In the United Kingdom, 4.3 million children live in poverty. Why? Because the productive forces are organized around the interests of capital rather than around the interests of people."

Jason Hickel *On Technology and Degrowth*, 2023, https://monthlyreview.org/2023/07/01/on-technology-and-degrowth/

A false dichotomy

"Degrowth does not call for all forms of production to be reduced. Rather, it calls for reducing ecologically destructive and socially less necessary forms of production, like sport utility vehicles, private jets, mansions, fast fashion, arms, industrial beef, cruises, commercial air travel, etc., while cutting advertising, extending product lifespans (banning planned obsolescence and introducing mandatory long-term warranties and rights to repair), and dramatically reducing the purchasing power of the rich. In other words, it targets forms of production that are organized mostly around capital accumulation and elite consumption. In the middle of an ecological emergency, should we be producing sport utility vehicles and mansions? Should we be diverting energy to support the obscene consumption and accumulation of the ruling class?"

"At the same time, degrowth scholarship insists on strong social policy to secure human needs and well-being, with universal public services, living wages, a public job guarantee, working time reduction, economic democracy, and radically reduced inequality."

"So, the public debate about degrowth founders on a false dichotomy. The real conflict is not between technology and anti-technology. It is about how technology is imagined and the conditions under which it is deployed. Degrowth research makes a strong claim to having a more scientific (and more just) approach to technological visions."

Jason Hickel *On Technology and Degrowth*, 2023, https://monthlyreview.org/2023/07/01/on-technology-and-degrowth/

“Does it really make sense to grow dirty things in order to get clean things? ”

“Yes, we need innovation to solve the ecological crisis. We need better solar panels, better insulation, better batteries, better recycling, better methods for producing steel, etc. But we do not need aggregate growth to get these things. If the objective is to achieve specific kinds of innovation, then target those directly rather than grow the whole economy indiscriminately and hope it will magically deliver the innovation we need. Is it really reasonable to grow the plastics industry, the beef industry, and the advertising industry in order to get more efficient trains? Does it really make sense to grow dirty things in order to get clean things? We must be smarter than that. Necessary innovations can be achieved directly – through public investment in innovation – while simultaneously scaling down less necessary forms of production.”

“Furthermore, we should note that capitalist growth imperatives quite often limit technological progress. Under capitalism, firms organize innovation not around socially necessary objectives, but rather around what serves their growth and profits. So we get innovations to maximize fossil fuel extraction, or maximize planned obsolescence, but precious little in areas that are clearly necessary but less profitable (such as renewable energy) or not profitable at all (such as public transit, repairable products, or medicines for neglected tropical diseases). Furthermore, even when innovations are socially beneficial, they are often locked up under patents that prevent rapid dissemination (as with the COVID-19 vaccines and battery technology).”

Jason Hickel *On Technology and Degrowth*, 2023, https://monthlyreview.org/2023/07/01/on-technology-and-degrowth/

Brent Toderian @BrentToderian · 20 apr 2022

We already know FOR SURE that EVs don't solve the HUGE space, parking & congestion problems in cities caused by TOO MANY VEHICLES no matter what their power source (and remember, vehicles are getting BIGGER), OR the shocking number of deaths & injuries each year from car crashes.

https://twitter.com/BrentToderian/status/1516822703054852097

Brent Toderian @BrentToderian · 20 apr 2022

But the part that's maybe the MOST concerning is our tendency (see #JevonsParadox) to buy more/bigger vehicles & drive them further if we think they've gotten better ("greener"). We KNOW the resulting more/bigger cars & kms driven has been outpacing the benefits of "better cars."

https://twitter.com/BrentToderian/status/1516822703054852097

Brent Toderian @BrentToderian · 21 apr 2022

"Electrification has been touted as a silver bullet: an easy solution that alleviates the GHG burden from car owners worldwide. This isn't the case. Extensive vehicle electrification only lowers emissions by a portion of what's needed." Via @WRIRossCities

ITDP | Institute for Transportation & Development Policy

itdp.org

To Combat Climate Change, Electrification needs Compact Cities for ...

The research is clear: without aggressively tackling rising global temperatures, there will be catastrophic global consequences within ...

Brent Toderian @BrentToderian · 21 apr 2022

"While it's critical to go electric, at the same time, we must make every move necessary to ensure that we achieve fewer cars, less driving, more inviting alternatives, and better cities." My comments, among others, in @CarltonReid's new @Forbes EV article

forbes.com

Fifth Of U.K.'s Electric Vehicle Charging Points Still Free To Use

Almost 5,350 of the 25,000 charging devices listed on EV charging locator service Zap-Map last year were free to use. But such generosi...

https://twitter.com/BrentToderian/status/1516822703054852097

Brent Toderian @BrentToderian · 22 apr 2022

Over the last decade, global SUV ownership has doubled. If it keeps growing at its current rate, increased SUV ownership will offset the entire emissions reduction from electric vehicles. Plus they're much more likely than smaller cars to kill pedestrians.

fastcompany.com

Should we outlaw SUVs?

They are an enormous cause of emissions, and deadly to pedestrians. Is it time for automakers to stop selling them or cities to stop allowing...

https://twitter.com/BrentToderian/status/1516822703054852097

Brent Toderian @BrentToderian · 22 apr 2022

Here's the blunt reality — reasonably-sized electric vehicles need to be the future of cars, but they can't be the future of urban mobility.

Fewer cars.
Less driving.
More inviting mobility options.
Better communities and cities.

These are the 4 pillars of the REAL solution.

45 865 3.009

Brent Toderian @BrentToderian · 24 apr 2022

"The report makes clear that simply replacing gasoline with batteries won't be enough: cities must also dramatically curtail the use of automobiles and avoid 'locking in' future emissions by building more car-dependent infrastructure." Via @StreetsblogUSA

mass.streetsblog.org

International Climate Report Demands 'Systemic' Changes to Transp...

Simply replacing gasoline with batteries won't be enough: cities must also dramatically curtail the use of automobiles and build more ...

Brent Toderian @BrentToderian · 14 mag 2022

The future of transportation isn't the #Hyperloop or self-driving cars. It's the bus, the bike, & the elevator. Via @slate

AND it's better land-use & infrastructure decisions, reprioritizing space & budgets, accessible streets, & smart pricing mechanisms.

slate.com

The Future of Transportation Is Not the Hyperloop or the Self-Driving ...

Getting people around in new, different ways relies mostly on technologies that we have had for a while.

Brent Toderian @BrentToderian · 18 giu 2022

Never forget, the electric car is here to save the car industry, not the planet.

Brent Toderian @BrentToderian · 18 giu 2022

"In a 2050 scenario, there's time for everything to happen that needs to happen. But in 2030 it just isn't going to happen. Just look at the mess we're in from a lithium supply standpoint with less than 10% EV penetration."

There's not enuf battery metal.

bnnbloomberg.ca

'Mr. Lithium' Warns There's Not Enough Battery Me...

A mining company consultant with decades of experience doubts the industry will be able to ...

https://twitter.com/BrentToderian/status/1516822703054852097

Brent Toderian
@BrentToderian

As I put it recently in my blunt advice to Irish cities, “Your goal SHOULDN’T be to replace a million fossil fuel vehicles with a million electric vehicles. It should be to replace a million fossil fuel vehicles with 250K electric vehicles. The answer HAS to be FEWER cars."

Traduci post

11:16 PM · 26 lug 2022

Brent Toderian @BrentToderian · 11 ott 2022

Clearly I’m not saying EVs aren’t part of the broader solution, but the main goal HAS to be less driving & fewer cars. Picture tobacco companies selling “better cigarettes” as the solution (which can actually lead to MORE smoking), when we know the solution is to limit smoking.

https://twitter.com/BrentToderian/status/1516822703054852097

Energy and Climate: The Dilemma, Trilemma, and Quadrilemma

ICPAC · Follow
7 min read · Nov 17, 2020

By guest author, Dr Tedd Moya Mose, Oxford Martin Fellow at Oxford University's Martin Programme on Integrating Renewable Energy.

Contributions by ICPAC Climate Change Technical Working Group

The Dilemma

The energy industry has been the cause of economic transformations and also socio-economic and ecological problems. Electricity and modern energy services have transformed humanity. In generously broad terms, energy can be interpreted as the power that enables people and things to effectively transform or transport things and persons. In the last half-century, the link between energy and global economic growth has been evident (1). However, energy and economic development lead to increased greenhouse gases (GHGs) emission, especially carbon dioxide (CO2) emissions. (2). Burning fossil fuels (3) increases the concentration of CO2, the most abundant Greenhouse Gas in the atmosphere, leading to global warming (4). This warming has caused at least seven unprecedented climate conditions in recent history (5). These records are likely to be progressively broken in the coming years (6); making climate change 'the greatest energy-related externality of all time' (7). 'The climate emergency' was named the word of the year in 2019 (8). So, the dilemma is this. Energy has the confounding characteristic as a force of both human progress and ecological destruction. The predicament is the clash between the rising global energy demand and the need to radically reduce CO2 emissions. This dilemma has led to calls for increased integration of more sustainable (renewable) energy sources in global energy systems.

https://icpac.medium.com/energy-and-climate-the-dilemma-trilemma-and-quadrilemma-839a8d657369

The Trilemma

The "energy trilemma" (9), was coined by the World Energy Council (10), and is a succinct summary of the most pressing international problems that involve energy and climate change (11). There are several variations of the definition of the energy trilemma. However, they all address three fundamental challenges: those emanating from economics (affordability), politics (energy security or security of energy supply) and the environment (including climate change and sustainability) (12). Recently, energy accessibility has been added in the case of developing countries. Having seen the role energy plays in climate change above, resolving the energy trilemma is complex. First, despite causing global warming there is still substantial global reliance on fossil fuels for energy (13). Projections are not encouraging either. Fossil fuels supply about 85% of global primary energy and may still form about 74% of the mix in 2040 (14).

Meanwhile, the UN Global Goals on affordable and Clean Energy (SDG 7) urge us to change our current reliance on fossil fuels to more sustainable and less harmful ways (15). This goal is commendable but faces practical complexities. Energy that is cheap may not be good for the environment (coal and gas), sustainable may be intermittent, variable and insufficient to power industrial uses (renewable energy), and sustainable energy may not be locally available leading to continued use of fossil fuels for self-reliance (energy security). The 'Energy Trilemma' is important because it states both the problem and provides a framework to deliver the energy transformation needed to make sustainable energy systems a reality. How? By ensuring that energy decisions consider these competing interests and are not guided only by profit, financial considerations, or the need for energy self-reliance. On the bright side, advancement in the solar energy sector has also resulted in solar energy being reported as the cheapest electricity in history.

https://icpac.medium.com/energy-and-climate-the-dilemma-trilemma-and-quadrilemma-839a8d657369

The World Energy Trilemma Index has been prepared annually since 2010 by the World Energy Council in partnership with global consultancy Oliver Wyman, along with Marsh & McLennan Advantage of its parent Marsh & McLennan Companies.

Healthy energy systems are secure, equitable and environmentally sustainable, showing a carefully managed balanced Trilemma between the three dimensions. Maintaining this balance in context of rapid transition to decentralised, decarbonised and digital systems is challenging with the risk of passive trade-offs between equally critical priorities.

Energy leaders need to manage the competing demands of the energy trilemma. The World Energy Trilemma Index is an annual measurement of national energy system performances across each of the three trilemma dimensions:

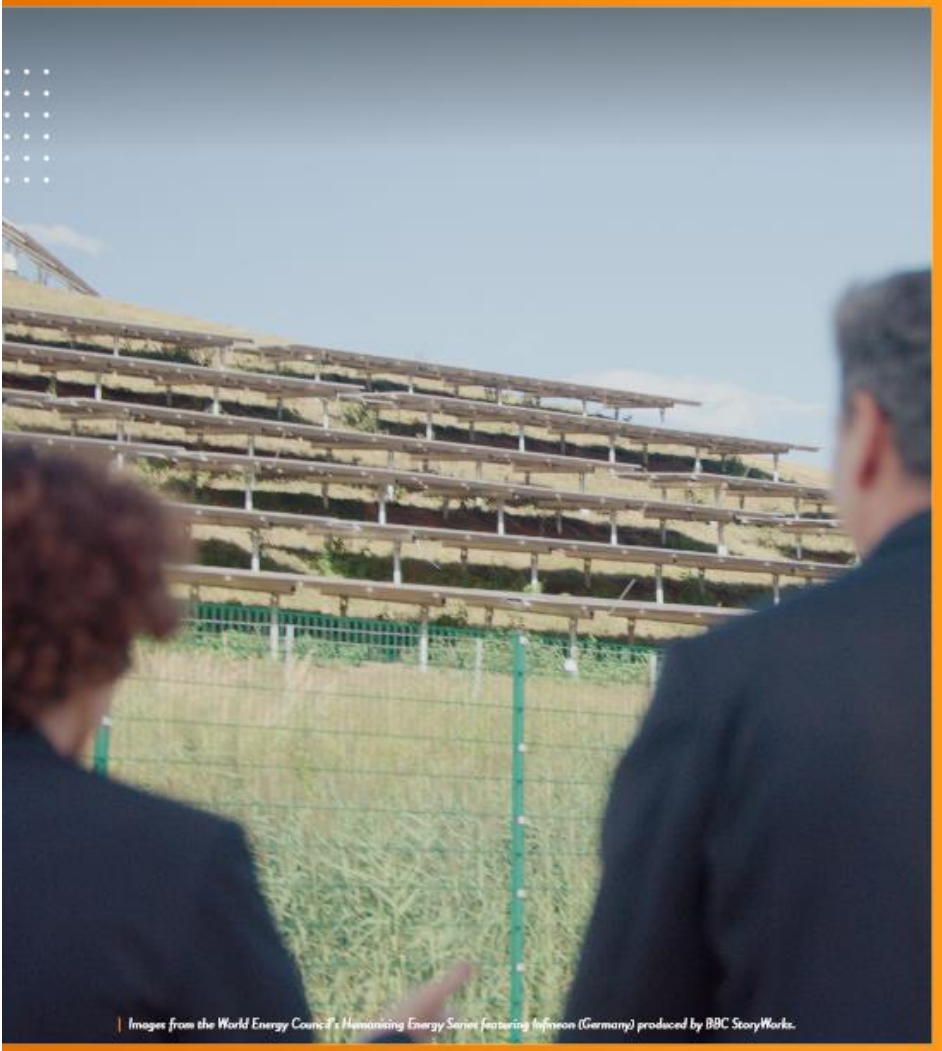
- **Energy Security** measures a nation's capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies. The dimension covers the effectiveness of management of domestic and external energy sources, as well as the reliability and resilience of energy infrastructure.

- **Energy Equity** assesses a country's ability to provide universal access to reliable, affordable, and abundant energy for domestic and commercial use. The dimension captures basic access to electricity and clean cooking fuels and technologies, access to prosperity-enabling levels of energy consumption, and affordability of electricity, gas, and fuel.

- **Environmental Sustainability** of energy systems represents the transition of a country's energy system towards mitigating and avoiding potential environmental harm and climate change impacts. The dimension focuses on productivity and efficiency of generation, transmission and distribution, decarbonisation, and air quality.

https://www.worldenergy.org/transition-toolkit/world-energy-trilemma-index

WORLD ENERGY COUNCIL

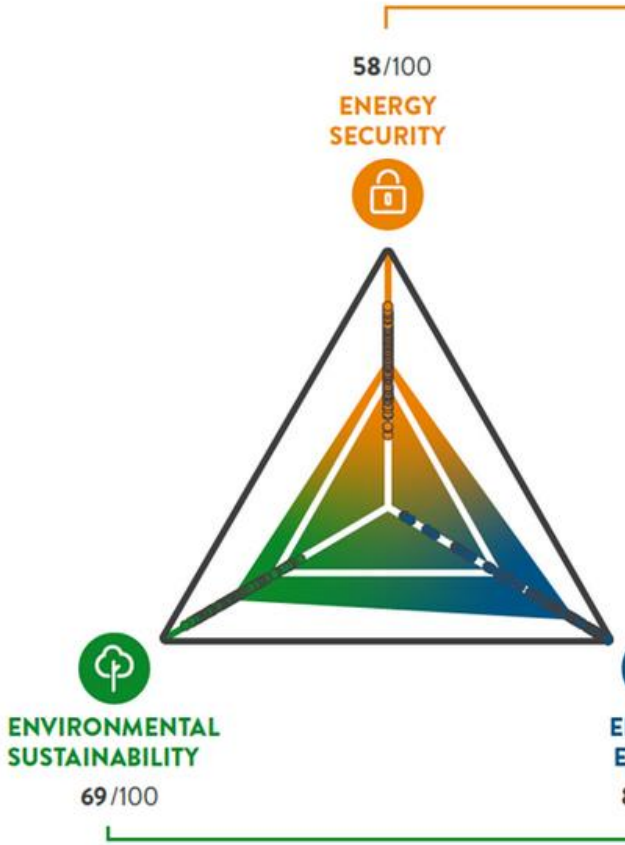


| Images from the World Energy Council's Humanising Energy Series featuring Infineon (Germany) produced by BBC StoryWorks.

WORLD ENERGY

TRILEMMA INDEX 2022

In partnership with Oliver Wyman



Reflects a nation's capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies.

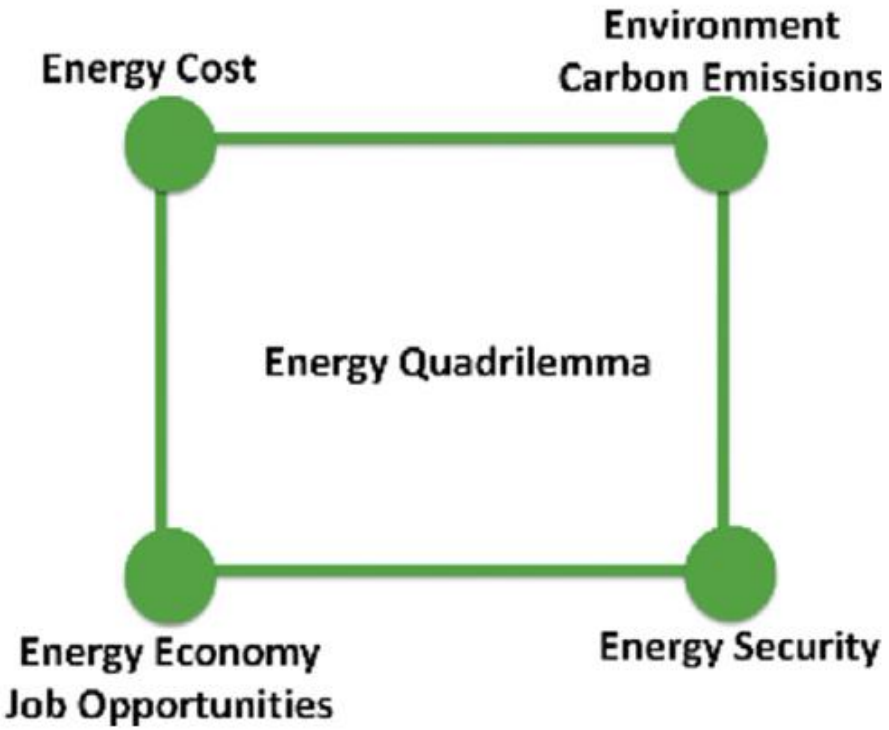
Assesses a country's ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use.

Represents the transition of a country's energy system towards mitigating and avoiding potential environmental harm and climate change impacts.

https://www.worldenergy.org/transition-toolkit/world-energy-trilemma-index

The Quadrilemma

The energy quadrilemma adds the fourth element (of social dimensions of energy) that focuses on people, their involvement, and the acceptance of decisions in the energy industry. This fourth issue concerns itself with providing energy in a just and sustainable way. Generally referred to as 'energy justice', it is concerned with identifying when and where injustices occur in energy systems and how best law and policy can respond (16). Conceptualized as having three principal tenets (distributional justice, procedural justice, and recognition justice) (17), it deals with both macro-justice (on societal impacts of energy and how fair and just their institutional decisions are) as well as micro-justice (how individuals are impacted by systemic outcomes) (18). However, as demonstrated above, we still do not have an energy source that fully satisfies the energy trilemma or is clearly socially accepted as 'justice-neutral'. (19)



https://icpac.medium.com/energy-and-climate-the-dilemma-trilemma-and-quadrilemma-839a8d657369
https://www.sciencedirect.com/science/article/abs/pii/S0360544216310696

Existing climate mitigation scenarios perpetuate colonial inequalities

Jason Hickel, Aljoša Slameršak

Key messages

- The world is characterised by striking inequalities of energy use between the Global North and the Global South
- Existing climate mitigation scenarios reviewed by the Intergovernmental Panel on Climate Change perpetuate Global North–Global South inequalities for the rest of the century
- Scenarios that rely on bioenergy-based negative emissions technologies appropriate land in the Global South to support the Global North's energy privilege
- There is an urgent need to develop scenarios that represent energy convergence to just and sustainable levels

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"Why should countries in the Global South accept such an inequitable future?
Why should these countries accept heightened risk of climate catastrophe—which already disproportionately harms them—so that wealthy countries can maintain an economic model based on overproduction and accumulation?
Why should the Global South hand over their cropland and ecosystems to support excess in the Global North?

Climate mitigation scenarios are intended to represent a range of possible futures, to explore trade-offs, and to facilitate public debate about how best to approach the transition. This range is supposed to include undesirable or unjust futures, as well as better, alternative futures that show how the world could be arranged differently.

The problem is that the existing range overwhelmingly represents futures of substantial Global North–Global South inequality, and does not explore futures of convergence and equity."

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Original research article

Embodied energy injustices: Unveiling and politicizing the transboundary harms of fossil fuel extractivism and fossil fuel supply chains

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ABSTRACT

We introduce the new concept of *embodied energy injustices* in order to encourage integrative, systemic, transboundary assessment of the global implications and responsibility of energy-policy decisions. Embodied energy injustices reframe considerations of energy justice to explicitly consider hidden and distant injustices (upstream or downstream) arising from the extraction, processing, transportation and disposal of energy resources. We assess the embodied energy injustices connected to the decision to decommission a coal-fired power plant in Salem, Massachusetts, US, and its replacement with a natural-gas-fired power station. *Cerrejón* open-pit coalmine in La Guajira, Colombia, powered the Salem plant for over a decade. Fracked gas from Pennsylvania now supplies fuel for the new power station. Comparing the extraction of these two very different fuels reveals multiple parallel injustices. But the regulatory environment fails to account for the different constituencies, jurisdictions and effects that fall outside the formal remit of existing impact assessments. We therefore call for mandatory transboundary impact assessments of large-scale energy-related projects, which explicitly integrate previously unrecognized social-environmental harms and injustices. Expanding energy law and policy discussions to incorporate embodied energy injustices can enhance sustainable energy governance and enable corporate accountability for the transboundary harms of fossil fuel extraction and use. Linking *chains of energy injustice*—by revealing their interconnected positions along fossil-fuel supply chains—may help generate and unite powerful trans-local solidarity movements, which politicize local struggles within wider national, regional and global energy politics.

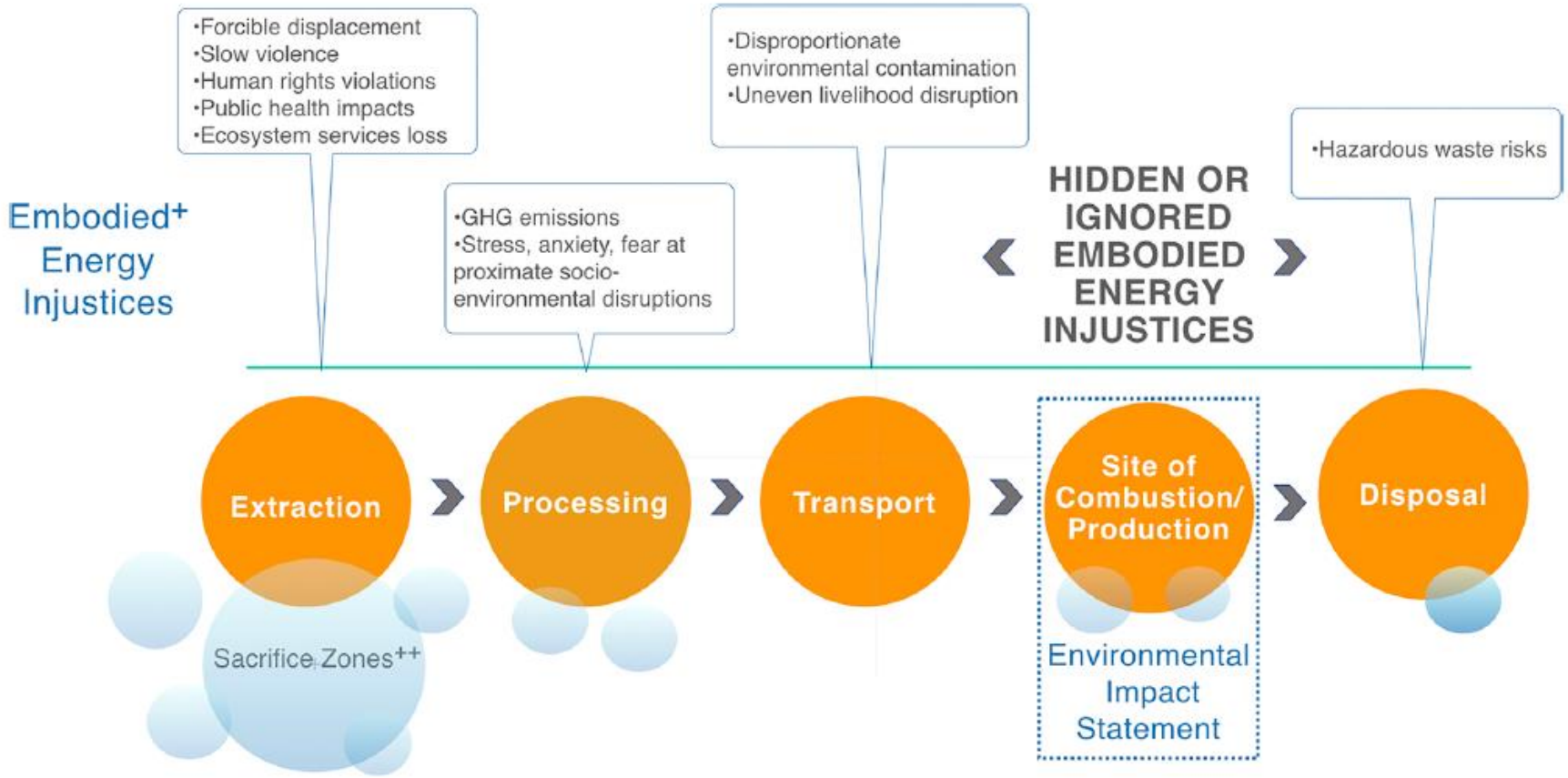
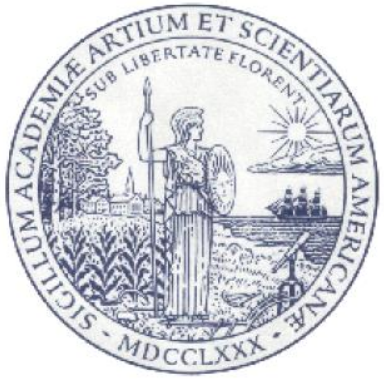


Fig. 1. Embodied energy injustices explicitly consider hidden and distant injustices (upstream or downstream) arising from the extraction, processing, transportation and disposal of energy resources.

LANGDON WINNER

Do Artifacts Have Politics?

The MIT Press



Do Artifacts Have Politics?
Author(s): Langdon Winner
Source: *Daedalus*, Vol. 109, No. 1, Modern Technology: Problem or Opportunity? (Winter, 1980), pp. 121-136
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Accessed: 06/10/2009 20:50

Do Energy Systems Have Politics?

“Designing technology is designing human beings”

Technological instrumentalism: theory according to which technological objects are tools, they are means to an end; ends are set and pursued by humans; technology is in itself neutral (does not embody values, does not influence perception, does not determine action, does not decide).

Technological mediation theory: artefacts constitute mediators in the relationship between human beings and the world. As such, they shape our actions, experiences and practices. “The design of interactions implies not only the design of technological objects that allow for specific interactions, but also the design of the human subjects who interact with these objects”

Affordances: possibilities of use, practical opportunities that each object offers the user. They are relational properties.

Potential function sets, which anthropocentric design also allows new users to easily identify. Costs and rewards.

P.P. Verbeek, *Beyond interaction: A short introduction to mediation Theory,* “Interactions” 22(3), 2015, pp. 26-31.

Do Artifacts Have Politics?

An invention, design, or arrangement of a specific technical device or system

- can be a way of settling an issue in a particular community;
- can manifest political effects after its adoption;
- can require or be strongly compatible with a specific political relationship (e.g. authoritarian and democratic technologies; nuclear and solar energy).

Langdon Winner, *Do Artifacts Have Politics?*, in «Daedalus», 1980, 1, pp. 121-136.

Anyone who has traveled the highways of America and has become used to the normal height of overpasses may well find something a little odd about some of the bridges over the parkways on Long Island, New York. Many of the overpasses are extraordinarily low, having as little as nine feet of clearance at the curb. Even those who happened to notice this structural peculiarity would not be inclined to attach any special meaning to it. In our accustomed way of looking at things like roads and bridges we see the details of form as innocuous, and seldom give them a second thought.

It turns out, however, that the two hundred or so low-hanging overpasses on Long Island were deliberately designed to achieve a particular social effect. Robert Moses, the master builder of roads, parks, bridges, and other public works from the 1920s to the 1970s in New York, had these overpasses built to specifications that would discourage the presence of buses on his parkways. According to evidence provided by Robert A. Caro in his biography of Moses, the reasons reflect Moses's social-class bias and racial prejudice. Automobile-owning whites of "upper" and "comfortable middle" classes, as he called them, would be free to use the parkways for recreation and commuting. Poor people and blacks, who normally used public transit, were kept off the roads because the twelve-foot tall buses could not get through the overpasses. One consequence was to limit access of racial minorities and low-income groups to Jones Beach, Moses's widely acclaimed public park. Moses made doubly sure of this result by vetoing a proposed extension of the Long Island Railroad to Jones Beach.[8]

Technological change expresses a panoply of human motives, not the least of which is the desire of some to have dominion over others, even though it may require an occasional sacrifice of cost-cutting and some violence to the norm of getting more from less.

One poignant illustration can be found in the history of nineteenth century industrial mechanization. At Cyrus McCormick's reaper manufacturing plant in Chicago in the middle 1880s, pneumatic molding machines, a new and largely untested innovation, were added to the foundry at an estimated cost of $500,000. In the standard economic interpretation of such things, we would expect that this step was taken to modernize the plant and achieve the kind of efficiencies that mechanization brings. But historian Robert Ozanne has shown why the development must be seen in a broader context. At the time, Cyrus McCormick II was engaged in a battle with the National Union of Iron Molders. He saw the addition of the new machines as a way to "weed out the bad element among the men," namely, the skilled workers who had organized the union local in Chicago.[10] The new machines, manned by unskilled labor, actually produced inferior castings at a higher cost than the earlier process. After three years of use the machines were, in fact, abandoned, but by that time they had served their purpose—the destruction of the union. Thus, the story of these technical developments at the McCormick factory cannot be understood adequately outside the record of workers' attempts to organize, police repression of the labor movement in Chicago during that period, and the events surrounding the bombing at Haymarket Square. Technological history and American political history were at that moment deeply intertwined.

In cases like those of Moses's low bridges and McCormick's molding machines, one sees the importance of technical arrangements that precede the *use* of the things in question. It is obvious that technologies can be used in ways that enhance the power, authority, and privilege of some over others, for example, the use of television to sell a candidate. To our accustomed way of thinking, technologies are seen as neutral tools that can be used well or poorly, for good, evil, or something in between. But we usually do not stop to inquire whether a given device might have been designed and built in such a way that it produces a set of consequences logically and temporally *prior* to any of its professed uses.

Because the point is most easily understood in the light of particular intentions embodied in physical form, I have so far offered illustrations that seem almost conspiratorial. But to recognize the political dimensions in the shapes of technology does not require that we look for conscious conspiracies or malicious intentions. The organized movement of handicapped people in the United States during the 1970s pointed out the countless ways in which machines, instruments, and structures of common use—buses, buildings, sidewalks, plumbing fixtures, and so forth—made it impossible for many handicapped persons to move about freely, a condition that systematically excluded them from public life. It is safe to say that designs unsuited for the handicapped arose more from long-standing neglect than from anyone's active intention. But now that the issue has been raised for public attention, it is evident that justice requires a remedy. A whole range of artifacts are now being redesigned and rebuilt to accommodate this minority.

The mechanical tomato harvester, a remarkable device perfected by researchers at the University of California from the late 1940s to the present, offers an illustrative tale. The machine is able to harvest tomatoes in a single pass through a row, cutting the plants from the ground, shaking the fruit loose, and in the newest models sorting the tomatoes electronically into large plastic gondolas that hold up to twenty-five tons of produce headed for canning. To accommodate the rough motion of these "factories in the field," agricultural researchers have bred new varieties of tomatoes that are hardier, sturdier, and less tasty. The harvesters replace the system of handpicking, in which crews of farmworkers would pass through the fields three or four times putting ripe tomatoes in lug boxes and saving immature fruit for later harvest.[11] Studies in California indicate that the machine reduces costs by approximately five to seven dollars per ton as compared to hand-harvesting.[12] But the benefits are by no means equally divided in the agricultural economy. In fact, the machine in the garden has in this instance been the occasion for a thorough reshaping of social relationships of tomato production in rural California.

By their very size and cost, more than $50,000 each to purchase, the machines are compatible only with a highly concentrated form of tomato growing.

Within a given category of technological change there are, roughly speaking, two kinds of choices that can affect the relative distribution of power, authority, and privilege in a community:

1. Often the crucial decision is a simple "yes or no“ choice: are we going to develop and adopt the thing or not?

2. A second range of choices, equally critical in many instances, has to do with specific features in the design or arrangement of a technical system after the decision to go ahead with it has already been made.

Inherently political technologies

«Attempts to justify strong authority on the basis of supposedly necessary conditions of technical practice have an ancient history. A pivotal theme in the Republic is Plato's quest to borrow the authority of techne and employ it by analogy to buttress his argument in favor of authority in the state.

Among the illustrations he chooses, is that of a ship on the high seas.

Because large sailing vessels by their very nature need to be steered with a firm hand, sailors must yield to their captain's commands; no reasonable person believes that ships can be run democratically.

Plato goes on to suggest that governing a state is rather like being captain of a ship or like practicing medicine as a physician".

"Thus, Plato thought it a practical necessity that a ship at sea have one captain and an unquestioningly obedient crew."

Inherently political technologies

"A second , somewhat weaker, version of the argument holds **that a given kind of technology is strongly compatible with, but does not strictly require, social and political relationships of a particular stripe**.

Many advocates of solar energy now hold that technologies of that variety are more compatible with a democratic, egalitarian society than energy systems based on coal, oil, and nuclear power; at the same time they do not maintain that anything about solar energy requires democracy.

Their case is, briefly, that solar energy is decentralizing in both a technical and political sense: technically speaking, it is vastly more reasonable to build solar systems in a disaggregated, widely distributed manner than in large-scale centralized plants; politically speaking, solar energy accommodates the attempts of individuals and local communities to manage their affairs effectively because they are dealing with systems that are more accessible, comprehensible, and controllable than huge centralized sources. In this view, solar energy is desirable not only for its economic and environmental benefits, but also for the salutary institutions it is likely to permit in other areas of public life."

“What, after all, does modern technology make possible or necessary in political life?”

“In my reading of such notions […] there are two basic ways of stating the case.

1. One version claims that the adoption of a given technical system actually requires the creation and maintenance of a particular set of social conditions as the operating environment of that system.

2. A second, somewhat weaker, version of the argument holds that a given kind of technology is strongly compatible with, but does not strictly require, social and political relationships of a particular stripe.”

“The available evidence tends to show that many large, sophisticated technological systems are in fact highly compatible with centralized, hierarchical managerial control.”

“we examined **ways in which the intractable properties of certain kinds of technology are strongly, perhaps unavoidably, linked to particular institutionalized patterns of power and authority**.

Here, the initial choice about whether or not to adopt something is decisive in regard to its consequences. There are no alternative physical designs or arrangements that would make a significant difference; there are, furthermore, no genuine possibilities for creative intervention by different social systems – capitalist or socialist - that could change the intractability of the entity or significantly alter the quality of its political effects.”

The principle of technological inevitability

"The myth of technological and political and social inevitability is a powerful tranquilizer of the conscience. Its service is to remove responsibility from the shoulders of everyone who truly believes in it. But, in fact, there are actors!"

"As we ourselves have also observed, the reification of complex systems that have no authors, about which we know only that they were somehow given us by science and that they speak with its authority, permits no questions of truth or justice to be asked. I cannot tell why the spokesmen I have cited want the developments they forecast to become true. Some of them have told me that they work on them for the morally bankrupt reason that “If we don’t do it, someone else will.”

They fear that evil people will develop superintelligent machines and use them to oppress mankind, and that the only defense against these enemy machines will be superintelligent machines controlled by us, that is, by well-intentioned people. Others reveal that they have abdicated their autonomy by appealing to the “principle” of technological inevitability".

Joseph Weizenbaum, *Computer power and human reason. From judgement to calculation*, 1976.

upf. BARCELONA SCHOOL OF MANAGEMENT

Thank you

Any questions?

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