TECHNOLOGY & STATECRAFT

The Perennial Problems

Summer 2025

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Introduction

To survive, humans require craft knowledge (*technē*), resources, and fuel that we neither possess spontaneously nor understand organically. As a species, we seem to excel at using tools. But the very things we most need to live and to thrive are neither given to us by instinct, nor transmitted to us through genetic inheritance.

Our situation raises the question: what does it mean for us to be creatures that depend on technology? What does the *fact* of our technological dependence mean for us as individuals, as groups, as political communities and members of economic networks? What does it mean for our self-understanding? For the prospects of knowledge, morality, spirituality, and happiness? How might a deep understanding of this fact inform our choices and actions as leaders, or as builders, or as mentors and parents?

We aim to pursue these questions by exploring the main problems, or tensions, that emerge from a serious engagement with the question of technology's place in the human situation.

We aren't the first to ask these questions, and in some sense, our predecessors saw the facts of technology more clearly than we do. Plato and Aristotle, for instance, were much closer to the advent of the agricultural city-state; they understood its origins, its rise, and its fall, as part of their lived experience. Similarly, Francis Bacon helped usher in the age of Enlightenment, and was personally involved with articulating and defending a new vision for science, politics, and technology. These thinkers confronted the facts of technology in ways unfettered by our current prejudices, which are often tethered to notions of progress or familiarity. These modern notions obscure what is truly at stake, mainly by taking certain ideas or developments for granted.

A note on reading: our readings are mostly passages excerpted from larger texts. We start, therefore, on false footing because we've done our authors a disservice. We highly recommend that you read these books in their entirety; if possible, with friends in a group such as ours. When you read, try to read actively. Read physical books, with pen in hand. Ask the author questions as you go. Argue with him or her, but not to refute or undermine. **The core principle of reading is to always strive to understand the author as they understood themselves.** This requires granting them intellectual charity, even when it perhaps seems undeserved. We have to strain against our own impulses and prejudices to keep our minds open and receptive to new ideas. Reading actively requires a new kind of habit, where we learn to suspend our need for answers and interrogate our assumptions—a habit that is helped along by seeing for ourselves disagreement at the highest levels over the most important questions.

The words of the greatest minds only become intelligible to us, their students, when we first grasp the *problems* they are addressing.

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Plato, *Phaedrus*

274b–278b, The Myth of Theuth and Thamos

274b PHAE.: What then?

SOC.: Then the matter about the seemliness and unseemliness of writing—coming about in what way is it in a beautiful state, and in what way unseemly—is what remains. Isn't it?

PHAE.: Yes

SOC.: Well then, do you know in what way, concerning speeches, you will most gratify god, whether acting or speaking?

PHAE.: Not at all. Do you?

274c SOC.: I have something to say heard from men of former times; they themselves know the truth. And if we by ourselves should find this, would we then any longer have any care for human conjectural opinions?

PHAE.: What you asked is ridiculous. But say what you assert that you've heard.

SOC.: Well now, I heard how there was, near Naucratis in Egypt, a certain one of the old gods there, whose sacred bird is the one they call Ibis. And the name of
274d this demon is Theuth. Now, this one first found number and calculation, geometry and astronomy, and further, draughts and games of dice, and then, indeed, written letters. Now furthermore, at that time the king of all Egypt was Thamos, in the upper region's great city, which the Greeks call Egyptian Thebes; and they call the god Ammon.[1] Coming to him, Theuth displayed his arts and said they must be given out to the other Egyptians. He asked what benefit each
274e art had, and as the other went through them, he expressed blame on the one hand, praise on the other, for what in his opinion the other spoke beautifully or not beautifully. Many things, then, about each art in both senses, it is said, did Thamos reveal to Theuth, to go through which would make a long speech. And when it came to written letters, "This knowledge, king," said Theuth, "will make the Egyptians wiser and provide them with better memory; for it has been found as a drug for memory and wisdom." And the other said, "Most artful Theuth, one person is able to bring forth the things of art, another to judge what allotment of harm and of benefit they have for those who are going to use them.
275a And now you, being the father of written letters, have on account of goodwill said the opposite of what they can do. For this will provide forgetfulness in the souls of those who have learned it, through neglect of memory, seeing that, through trust in writing, they recollect from outside with alien markings, not reminding themselves from inside, by themselves. You have therefore found a

[1] Several editors accept one or another emendation, which yields "they call Thamos Ammon" or "they call the god Thamos Ammon."

drug not for memory, but for reminding. You are supplying the opinion of wisdom to the students, not truth. For you'll see that, having become hearers of
275b much without teaching, they will seem to be sensible judges in much, while being for the most part senseless, and hard to be with, since they've become wise in their own opinion[2] instead of wise."

PHAE.: Socrates, you easily make Egyptian speeches—and speeches from whatever country you wish.

SOC.: Well, my friend, people in the sacred temple of Zeus at Dodona asserted that the first prophetic speeches came into being from an oak tree. Now, for the men of that time, seeing that they were not wise like you young men, it sufficed,
275c because of their simplemindedness, to hear from an oak and a rock, if only they should say true things; for you, however, perhaps it makes a difference who the speaker is and from what country. For you do not look at only that thing: whether it is so or otherwise.

PHAE.: You have given a correct rebuke, and in my opinion the situation as regards written letters is as the Theban says.

SOC.: So then, he who supposes that he has left behind an art in writing, and and he who in turn receives it with the thought that there will be something distinct and solid from writings, would be full of much simplemindedness and would
275d fail to understand Ammon's prophecy, supposing written speeches to be something more than reminding one who knows about the things that the writings are about.

PHAE.: Most correct.

SOC.: Indeed writing, Phaedrus, doubtless has this feature that is terribly clever, and truly resembles painting.[3] For the offspring of that art stand there as living beings, but if you ask them about something, they altogether keep a solemn silence. And likewise speeches do the same. For you would think that they speak with some understanding, but if you ask something about the things said, wishing to learn, it indicates some one thing only, and always the same. And
275e when it's been once written, every speech rolls around everywhere, alike by those who understand and in the same way by those for whom it is in no way fitting, and it does not know to whom it ought to speak and to whom not. And when it suffers offense and is reviled without justice it always needs its father's assistance. For by itself it cannot defend or assist itself.

PHAE.: These things you've said are also most correct.

276a SOC.: What then? Do we see another speech, the brother of this one, and

[2] *Doxosophoi*, probably coined by Plato, might also mean "wise in appearance" or "wise in (others') opinion."

[3] *Zōgraphia*, painting or the art of painting, has the roots "alive/animals/life" and "writing."

genuine—do we see in what manner it comes into being and how much better and more powerful it naturally is than this one?

PHAE.: What is this one and how do you say it comes into being?

SOC.: The one that is written with knowledge in the soul of him who understands, with power to defend itself, and knowing to speak and to keep silence toward those it ought.

PHAE.: You are speaking of the speech of him who knows, a speech living and endowed with soul, of which the written speech might justly be said to be a certain image.

276b SOC.: Just so, absolutely. Then tell me this: would a farmer who has intelligence sow seeds, if he is concerned with them and wishes them to become fruitful, in the gardens of Adonis[4] in summertime and would he rejoice in seeing them become beautiful in eight days, or would he do these things for the sake of play and festivity, when indeed he would do so at all? With seeds that he is serious about, using the art of farming, having sown them where it is fitting, would he be contented when the seeds he'd sown attained their end in the eighth month?

276c PHAE.: In this way, doubtless, Socrates, he would do the one set of things seriously and the others in the other way that you're saying.

SOC.: Shall we say that he who has sciences of just and beautiful and good things has less intelligence in regard to his own seeds than the farmer?

PHAE: Least of all shall we say this.

SOC.: He will therefore not seriously write these things in black water, sowing through a reed pen with speeches that are powerless on the one hand to assist themselves with argument, powerless on the other to teach true things competently.

PHAE.: Certainly not, as it's likely, at least.

276d SOC: No indeed. But he will sow the gardens in writings, as is likely, and write, when he writes, for the sake of play, storing a treasure of reminders for himself. When he comes into an old age of forgetfulness; and for everyone who is going after the same track, he'll be pleased to see the gardens naturally grow up tender. But when others engage in other kinds of play, watering themselves with drinking parties and other things that are brothers to these, then that man, as is likely, will pass his time playing with the things I'm speaking of instead of these.

276e PHAE.: You are speaking of altogether beautiful play as compared with ordinary play, Socrates—of him who is able to play in speeches, telling tales about justice

[4] Special flowerpots set out to celebrate the festival of Adonis, a beautiful youth after whose premature death Zeus decreed that Adonis should spend half the year on earth with Aphrodite and half the year in the underworld with Persephone. The cult evokes thoughts of death, rebirth, and harvest.

and the other things you are speaking of.

SOC.: So it is, indeed, Phaedrus. But much more beautiful, I think, is the seriousness that comes into being about these things, when someone using the
277a dialectical art, taking hold of a fitting soul, plants[5] and sows with knowledge speeches that are competent to assist themselves and him who planted and are not barren but have seed, whence other speeches, naturally growing in other characters, are competent to pass this on, ever deathless, and make him who has it experience as much happiness as is possible for a human being.

PHAE.: What you're saying here is indeed still more beautiful.

SOC.: Now then, Phaedrus, these things having been agreed on, we are at the point we can judge those things.

PHAE.: What sort of things?

SOC.: Things that we wanted to see about and so have come to this point here, in
277b order that we might closely examine both the reproach against Lysias concerning the writing of speeches and the speeches themselves, which might be written by art and without art. So then, what is within the realm of art, and what is not, seems to me to have been made clear in due measure.

PHAE.: It seems so, at any rate. But remind me again how.

SOC.: Until someone knows the truth of each of the things that he speaks or writes about; and becomes able to define every thing in relation to the thing itself; and having defined it, knows how, next, to cut it in accordance with forms all the way to what is uncuttable; and, seeing clearly concerning the soul's
277c nature in accordance with these same things, discovering the form that fits together with each nature, in this way sets down and orders the speech, giving speeches of many colors and embracing all harmonic modes to a many-colored soul and simple ones to a simple soul—before this he will not be able to handle with art the class of speeches, to the extent that it naturally admits of it, either for teaching something or for persuading something, as the whole earlier argument has disclosed to us.

PHAE.: Absolutely, indeed, this is doubtless how it came to light.

277d SOC.: And what in turn about its being beautiful or shameful to speak and to write speeches, and in what way, when it comes to be, it might be said with justice to be a matter of reproach or not? Haven't the things said a little earlier made it clear?

PHAE.: What sort of things?

SOC.: That if either Lysias or anyone else has ever written or will write, in private or in public, setting down laws, writing a political written composition, and

[5] *Phuteuō* can mean "beget" as well as "plant."

then considering that some great solidity and clarity are in it—for someone writing in this fashion, there is matter of reproach, whether anyone says so or
277e not.[6] For to be ignorant, both awake and in dreams, about things just and unjust, bad and good, does not in truth escape reproach aimed at it, even if the whole mob should praise it.

PHAE.: Indeed not, then.

SOC.: He, however, who considers that there is of necessity much playfulness in the written speech about each thing and that no speech has ever been written, in meter or without meter, that is worthy of great seriousness (nor spoken, in the way that recited[7] speeches are spoken, for the sake of persuasion, without
278a examination and teaching) but that in reality the best of them are a reminding of those who know; who considers that being clear and complete and worthy of seriousness is present only in things taught and said for the sake of learning and really written in the soul, concerning things just and beautiful and good; and that he ought to declare such speeches of his to be like genuine sons, first the speech in himself, if, having been found, it is present in him, and next if some
278b offspring and at the same time brothers of this one have naturally grown in other souls of others in accordance with their worth; and who lets the other speeches go and farewell—such a man as this, Phaedrus, is probably such as you and I might pray that I and you should become.

PHAE.: Absolutely, indeed, I for one wish and pray for the things you are saying.

[6] That is, whether or not the reproach is stated. De Vries supports a possible alternative: whether or not someone (who writes) says so (sc., that he believes solidity and clarity to inhere in his writing).
[7] The verb *rhapsōdeō* refers especially to reciters of poetry. Cf. Plato's *Ion* for Socrates' examination of a famous rhapsode, and consider Xenophon's *Symposium* 3.7, where Socrates explains the view that no tribe of men is sillier than the rhapsodes by asserting that they do not understand the deeper or covert meanings.

Plato, *Protagoras*

317e–328d, The Myth of Prometheus

317e SOC.: When we were all seated, Protagoras said: Now that the company are assembled, Socrates, tell me about the young man of whom you were just now speaking.

318a I replied: I will begin again at the same point, Protagoras, and tell you once more the purport of my visit: this is my friend Hippocrates, who is desirous of making your acquaintance; he would like to know what will happen to him if he associates with you. I have no more to say.

Protagoras answered: Young man, if you associate with me, on the very first day you will return home a better man than you came, and better on the second day
318b than on the first, and better every day than you were on the day before.

When I heard this, I said: Protagoras, I do not at all wonder at hearing you say this; even at your age, and with all your wisdom, if any one were to teach you what you did not know before, you would become better no doubt: but please to answer in a different way—I will explain how by an example. Let me suppose that Hippocrates, instead of desiring your acquaintance, wished to become acquainted with the young man Zeuxippus of Heraclea, who has lately been in Athens, and he had come to him as he has come to you, and had heard him say,
318c as he has heard you say, that every day he would grow and become better if he associated with him: and then suppose that he were to ask him, "In what shall I become better, and in what shall I grow?"—Zeuxippus would answer, "In painting." And suppose that he went to Orthagoras the Theban, and heard him say the same thing, and asked him, "In what shall I become better day by day?" he would reply, "In flute playing." Now I want you to make the same sort of
318d answer to this young man and to me, who am asking questions on his account. When you say that on the first day on which he associates with you he will return home a better man, and on every day will grow in like manner,—In what, Protagoras, will he be better? and about what?

When Protagoras heard me say this, he replied: You ask questions fairly, and I like to answer a question which is fairly put. If Hippocrates comes to me he will not experience the sort of drudgery with which other Sophists are in the habit of
318e insulting their pupils; who, when they have just escaped from the arts, are taken and driven back into them by these teachers, and made to learn calculation, and astronomy, and geometry, and music (he gave a look at Hippias as he said this); but if he comes to me, he will learn that which he comes to learn. And this is prudence in affairs private as well as public; he will learn to order his own
319a house in the best manner, and he will be able to speak and act for the best in the affairs of the state.

Do I understand you, I said; and is your meaning that you teach the art of politics, and that you promise to make men good citizens?

That, Socrates, is exactly the profession which I make.

Then, I said, you do indeed possess a noble art, if there is no mistake about this; for I will freely confess to you, Protagoras, that I have a doubt whether this art is capable of being taught, and yet I know not how to disbelieve your assertion.
319b And I ought to tell you why I am of the opinion that this art cannot be taught or communicated by man to man. I say that the Athenians are an understanding people, and indeed they are esteemed to be such by the other Hellenes. Now I observe that when we are met together in the assembly, and the matter in hand relates to building, the builders are summoned as advisers; when the question is one of shipbuilding, then the ship-wrights; and the like of other arts which they think capable of being taught and learned. And if some person offers to give
319c them advice who is not supposed by them to have any skill in the art, even though he be good-looking, and rich, and noble, they will not listen to him, but laugh and hoot at him, until either he is clamored down and retires of himself; or if he persist, he is dragged away or put out by the constables at the command of the prytanes. This is their way of behaving about professors of the arts. But when the question is an affair of state, then everybody is free to have a say-carpenter, tinker, cobbler, sailor, passenger; rich and poor, high and low-any
319d one who likes gets up, and no one reproaches him, as in the former case, with not having learned, and having no teacher, and yet giving advice; evidently because they are under the impression that this sort of knowledge cannot be taught. And not only is this true of the state, but of individuals; the best and wisest of our citizens are unable to impart their political wisdom to others: as for
319e example, Pericles, the father of these young men, who gave them excellent instruction in all that could be learned from masters, in his own department of politics neither taught them, nor gave them teachers; but they were allowed to wander at their own free will in a sort of hope that they would light upon virtue
320a of their own accord. Or take another example: there was Cleinias the younger brother of our friend Alcibiades, of whom this very same Pericles was the guardian; and he being in fact under the apprehension that Cleinias would be corrupted by Alcibiades, took him away, and placed him in the house of Ariphron to be educated; but before six months had elapsed, Ariphron sent him back, not knowing what to do with him. And I could mention numberless other instances of persons who were good themselves, and never yet made any one
320b else good, whether friend or stranger. Now I, Protagoras, having these examples before me, am inclined to think that virtue cannot be taught. But then again, when I listen to your words, I waver; and am disposed to think that there must be something in what you say, because I know that you have great experience,

and learning, and invention. And I wish that you would, if possible, show me a
320c little more clearly that virtue can be taught. Will you be so good?

That I will, Socrates, and gladly. But what would you like? Shall I, as an elder, speak to you as younger men in an apologue or myth, or shall I argue out the question?

To this several of the company answered that he should choose for himself.

Well, then, he said, I think that the myth will be more interesting.

320d Once upon a time there were gods only, and no mortal creatures. But when the time came that these also should be created, the gods fashioned them out of earth and fire and various mixtures of both elements in the interior of the earth; and when they were about to bring them into the light of day, they ordered Prometheus and Epimetheus to equip them, and to distribute to them severally their proper qualities. Epimetheus said to Prometheus: "Let me distribute, and
320e do you inspect." This was agreed, and Epimetheus made the distribution. There were some to whom he gave strength without swiftness, while he equipped the weaker with swiftness; some he armed, and others he left unarmed; and devised for the latter some other means of preservation, making some large, and having their size as a protection, and others small, whose nature was to fly in the air or
321a burrow in the ground; this was to be their way of escape. Thus did he compensate them with the view of preventing any race from becoming extinct. And when he had provided against their destruction by one another, he contrived also a means of protecting them against the seasons of heaven; clothing them with close hair and thick skins sufficient to defend them against the winter cold and able to resist the summer heat, so that they might have a natural bed of their own when they wanted to rest; also he furnished them with
321b hoofs and hair and hard and callous skins under their feet. Then he gave them varieties of food-herb of the soil to some, to others fruits of trees, and to others roots, and to some again he gave other animals as food. And some he made to have few young ones, while those who were their prey were very prolific; and in this manner the race was preserved. Thus did Epimetheus, who, not being very
321c wise, forgot that he had distributed among the brute animals all the qualities which he had to give-and when he came to man, who was still unprovided, he was terribly perplexed. Now while he was in this perplexity, Prometheus came to inspect the distribution, and he found that the other animals were suitably furnished, but that man alone was naked and shoeless, and had neither bed nor arms of defense. The appointed hour was approaching when man in his turn was to go forth into the light of day; and Prometheus, not knowing how he could devise his salvation, stole the mechanical arts of Hephaestus and Athene,
321d and fire with them (they could neither have been acquired nor used without fire), and gave them to man. Thus man had the wisdom necessary to the support

of life, but political wisdom he had not; for that was in the keeping of Zeus, and the power of Prometheus did not extend to entering into the citadel of heaven, where Zeus dwelt, who moreover had terrible sentinels; but he did enter by stealth into the common workshop of Athene and Hephaestus, in which they
321e used to practice their favorite arts, and carried off Hephaestus' art of working by fire, and also the art of Athene, and gave them to man. And in this way man
322a was supplied with the means of life. But Prometheus is said to have been afterwards prosecuted for theft, owing to the blunder of Epimetheus.

Now man, having a share of the divine attributes, was at first the only one of the animals who had any gods, because he alone was of their kindred; and he would raise altars and images of them. He was not long in inventing articulate speech and names; and he also constructed houses and clothes and shoes and beds, and drew sustenance from the earth. Thus provided, mankind at first lived dispersed, and there were no cities. But the consequence was that they were
322b destroyed by the wild beasts, for they were utterly weak in comparison of them, and their art was only sufficient to provide them with the means of life, and did not enable them to carry on war against the animals: food they had, but not as yet the art of government, of which the art of war is a part. After a while the desire of self-preservation gathered them into cities; but when they were gathered together, having no art of government, they evil entreated one another, and were again in process of dispersion and destruction. Zeus feared that the
322c entire race would be exterminated, and so he sent Hermes to them, bearing reverence and justice to be the ordering principles of cities and the bonds of friendship and conciliation. Hermes asked Zeus how he should impart justice and reverence among men: Should he distribute them as the arts are distributed; that is to say, to a favoured few only, one skilled individual having enough of medicine or of any other art for many unskilled ones? "Shall this be the manner in which I am to distribute justice and reverence among men, or shall I give them to all?" "To all," said Zeus; "I should like them all to have a share; for cities
322d cannot exist, if a few only share in the virtues, as in the arts. And further, make a law by my order, that he who has no part in reverence and justice shall be put to death, for he is a plague of the state."

And this is the reason, Socrates, why the Athenians and mankind in general, when the question relates to carpentry or any other mechanical art, allow but a few to share in their deliberations; and when any one else interferes, then, as
322e you say, they object, if he be not of the favored few; which, as I reply, is very natural. But when they meet to deliberate about political virtue, which proceeds
323a only by way of justice and wisdom, they are patient enough of any man who speaks of them, as is also natural, because they think that every man ought to share in this sort of virtue, and that states could not exist if this were otherwise. I have explained to you, Socrates, the reason for this phenomenon.

And that you may not suppose yourself to be deceived in thinking that all men regard every man as having a share of justice or honesty and of every other political virtue, let me give you a further proof, which is this. In other cases, as you are aware, if a man says that he is a good flute player, or skilful in any other art in which he has no skill, people either laugh at him or are angry with him, and his relations think that he is mad and go and admonish him; but when
323b honesty is in question, or some other political virtue, even if they know that he is dishonest, yet, if the man comes publicly forward and tells the truth about his dishonesty, then, what in the other case was held by them to be good sense, they now deem to be madness. They say that all men ought to profess honesty whether they are honest or not, and that a man is out of his mind who says anything else. Their notion is, that a man must have some degree of honesty;
323c and that if he has none at all he ought not to be in the world.

I have been showing that they are right in admitting every man as a counselor about this sort of virtue, as they are of the opinion that every man is a partaker of it. And I will now endeavor to show further that they do not conceive this virtue to be given by nature, or to grow spontaneously, but to be a thing which
323d may be taught; and which comes to a man by taking pains. No one would instruct, no one would rebuke, or be angry with those whose calamities they suppose to be due to nature or chance; they do not try to punish or to prevent them from being what they are; they do but pity them. Who is so foolish as to chastise or instruct the ugly, or the diminutive, or the feeble? And for this reason. Because he knows that good and evil of this kind is the work of nature and of chance; whereas if a man is wanting in those good qualities which are
323e attained by study and exercise and teaching, and has only the contrary evil qualities, other men are angry with him, and punish and reprove him—of these
324a evil qualities one is impiety, another injustice, and they may be described generally as the very opposite of political virtue. In such cases any man will be angry with another, and reprimand him,—clearly because he thinks that by study and learning, the virtue in which the other is deficient may be acquired. If you will think, Socrates, of the nature of punishment, you will see at once that in
324b the opinion of mankind virtue may be acquired; no one punishes the evil-doer under the notion, or for the reason, that he has done wrong, only the unreasonable fury of a beast acts in that manner. But he who desires to inflict rational punishment does not retaliate for a past wrong which cannot be undone; he has regard to the future, and is desirous that the man who is
324c punished, and he who sees him punished, may be deterred from doing wrong again. He punishes for the sake of prevention, thereby clearly implying that virtue is capable of being taught. This is the notion of all who retaliate upon others either privately or publicly. And the Athenians, too, your own citizens, like other men, punish and take vengeance on all whom they regard as evil

doers; and hence, we may infer them to be of the number of those who think that virtue may be acquired and taught. Thus far, Socrates, I have shown you clearly enough, if I am not mistaken, that your countrymen are right in admitting the tinker and the cobbler to advise about politics, and also that they deem virtue to be capable of being taught and acquired.

324d There yet remains one difficulty which has been raised by you about the sons of good men. What is the reason why good men teach their sons the knowledge which is gained from teachers, and make them wise in that, but do nothing towards improving them in the virtues which distinguish themselves? And here, Socrates, I will leave the apologue and resume the argument. Please to *324e* consider: Is there or is there not some one quality of which all the citizens must be partakers, if there is to be a city at all? In the answer to this question is contained the only solution to your difficulty; there is no other. For if there be any such quality, and this quality or unity is not the art of the carpenter, or the *325a* smith, or the potter, but justice and temperance and holiness and, in a word, manly virtue—if this is the quality of which all men must be partakers, and which is the very condition of their learning or doing anything else, and if he who is wanting in this, whether he be a child only or a grown-up man or woman, must be taught and punished, until by punishment he becomes better, *325b* and he who rebels against instruction and punishment is either exiled or condemned to death under the idea that he is incurable—if what I am saying be true, good men have their sons taught other things and not this, do consider how extraordinary their conduct would appear to be. For we have shown that they think virtue capable of being taught and cultivated both in private and public; and, notwithstanding, they have their sons taught lesser matters, ignorance of which does not involve the punishment of death: but greater *325c* things, of which the ignorance may cause death and exile to those who have no training or knowledge of them—aye, and confiscation as well as death, and, in a word, may be the ruin of families-those things, I say, they are supposed not to teach them-not to take the utmost care that they should learn. How improbable is this, Socrates!

Education and admonition commence in the first years of childhood, and last to the very end of life. Mother and nurse and father and tutor are vying with one *325d* another about the improvement of the child as soon as ever he is able to understand what is being said to him: he cannot say or do anything without their setting forth to him that this is just and that is unjust; this is honorable, that is dishonorable; this is holy, that is unholy; do this and abstain from that. And if he obeys, well and good; if not, he is straightened by threats and blows, like a piece of bent or warped wood. At a later stage they send him to teachers, and enjoin them to see to his manners even more than to his reading and music; and *325e* the teachers do as they are desired. And when the boy has learned his letters

and is beginning to understand what is written, as before he understood only what was spoken, they put into his hands the works of great poets, which he
326a reads sitting on a bench at school; in these are contained many admonitions, and many tales, and praises, and encomia of ancient famous men, which he is required to learn by heart, in order that he may imitate or emulate them and desire to become like them. Then, again, the teachers of the lyre take similar care that their young disciple is temperate and gets into no mischief; and when they have taught him the use of the lyre, they introduce him to the poems of other
326b excellent poets, who are the lyric poets; and these they set to music, and make their harmonies and rhythms quite familiar to the children's souls, in order that they may learn to be more gentle, and harmonious, and rhythmical, and so more fitted for speech and action; for the life of man in every part has need of harmony and rhythm. Then they send them to the master of gymnastic, in order
326c that their bodies may better minister to the virtuous mind, and that they may not be compelled through bodily weakness to play the coward in war or on any other occasion. This is what is done by those who have the means, and those who have the means are the rich; their children begin to go to school soonest and leave off latest. When they have done with masters, the state again compels
326d them to learn the laws, and live after the pattern which they furnish, and not after their own fancies; and just as in learning to write, the writing-master first draws lines with a style for the use of the young beginner, and gives him the tablet and makes him follow the lines, so the city draws the laws, which were the invention of good lawgivers living in the olden time; these are given to the young man, in order to guide him in his conduct whether he is commanding or
326e obeying; and he who transgresses them is to be corrected, or, in other words, called to account, which is a term used not only in your country, but also in many others, seeing that justice calls men to account. Now when there is all this care about virtue private and public, why, Socrates, do you still wonder and doubt whether virtue can be taught? Cease to wonder, for the opposite would be far more surprising.

But why then do the sons of good fathers often turn out ill? There is nothing
327a very wonderful in this; for, as I have been saying, the existence of a state implies that virtue is not any man's private possession. If so—and nothing can be truer—then I will further ask you to imagine, as an illustration, some other pursuit or branch of knowledge which may be assumed equally to be the condition of the existence of a state. Suppose that there could be no state unless we were all flute players, as far as each had the capacity, and everybody was freely teaching everybody the art, both in private and public, and reproving the bad player as freely and openly as every man now teaches justice and the laws,
327b not concealing them as he would conceal the other arts, but imparting them—for all of us have a mutual interest in the justice and virtue of one

another, and this is the reason why every one is so ready to teach justice and the laws;—suppose, I say, that there were the same readiness and liberality among us in teaching one another flute-playing, do you imagine, Socrates, that the sons of good flute players would be more likely to be good than the sons of bad ones?
327c I think not. Would not their sons grow up to be distinguished or undistinguished according to their own natural capacities as flute players, and the son of a good player would often turn out to be a bad one, and the son of a bad player to be a good one, all flute players would be good enough in comparison of those who were ignorant and unacquainted with the art of flute playing? In like manner I would have you consider that he who appears to you to be the worst of those who have been brought up in laws and humanities,
327d would appear to be a just man and a master of justice if he were to be compared with men who had no education, or courts of justice, or laws, or any restraints upon them which compelled them to practice virtue—with the savages, for example, whom the poet Pherecrates exhibited on the stage at the last year's Lenaean festival. If you were living among men such as the man-haters in his Chorus, you would be only too glad to meet with Eurybates and Phrynondas,
327e and you would sorrowfully long to revisit the rascality of this part of the world. You, Socrates, are discontented, and why? Because all men are teachers of virtue, each one according to his ability; and you say, Where are the teachers?
328a You might as well ask, Who teaches Greek? For of that too there will not be any teachers found. Or you might ask, Who is to teach the sons of our artisans this same art which they have learned of their fathers? He and his fellow-workmen have taught them to the best of their ability,—but who will carry them further in their arts? And you would certainly have a difficulty, Socrates, in finding a teacher of them; but there would be no difficulty in finding a teacher of those who are wholly ignorant. And this is true of virtue or of anything else; if a man
328b is better able than we are to promote virtue ever so little, we must be content with the result. A teacher of this sort I believe myself to be, and above all other men to have the knowledge which makes a man noble and good; and I give my pupils their money's-worth, and even more, as they themselves confess. And therefore I have introduced the following mode of payment: when a man has been my pupil, if he likes he pays my price, but there is no compulsion; and if he
328c does not like, he has only to go into a temple and take an oath of the value of the instructions, and he pays no more than he declares to be their value.

Such is my Apologue, Socrates, and such is the argument by which I endeavor to show that virtue may be taught, and that this is the opinion of the Athenians. And I have also attempted to show that you are not to wonder at good fathers having bad sons, or at good sons having bad fathers, of which the sons of Polycleitus afford an example, who are the companions of our friends here, Paralus and Xanthippus, but are nothing in comparison with their father; and

this is true of the sons of many other artists. As yet I ought not to say the same
328d of Paralus and Xanthippus themselves, for they are young and there is still hope of them.

Translation by Benjamin Jowett, emended by Daniel Kolaks

Aristotle, *Politics*

Book 2, Chapter 8

1267B Hippodamus the Milesian, son of Euryphon, who devised a way of dividing cities and laid out the grid of the Peiraeus, became rather eccentric in other details of his life on account of a love of distinction—so much so that he seemed to some to be living too affectedly, long of hair, lavish of ornament, and yet in cheap but warm clothes not only in winter but in summertime as well, while professing to be an expert on the whole of nature. He was the first
30 of those who had not run a city to try his hand at saying something about the best form of government. He designed a city of ten thousand men in size, divided into three parts, for he made one part skilled craftsmen, one farmers, and a third part to defend the city and bear arms. And he divided the territory into three parts: sacred, public, and private—a sacred part from which people would carry out the customary worship of the gods, a common part which the city's defenders would live off, and private land belonging to the farmers. And he believed that there are only three forms of laws as well, since the things over which cases at law arise are these three in number: outrage,[8] damage, and
40 death. He also made a law that there would be one supreme court to which all lawsuits that were thought not to have been beautifully decided had to be
1268A referred, and he set this up to consist of certain selected elders. And he believed judgments in the lawcourts ought not to be arrived at by casting votes, but each member should carry a tablet on which to write his verdict, if he found the defendant guilty simply, but leave it blank if he acquitted simply, and if it was not one way or the other, he was to indicate this by making distinctions. For he believed the way laws are now applied is not beautifully done, since it forces people to commit perjury by judging either this way or that. He also set down a law about those who discover anything advantageous to the city, that they should get an honor, and one that support for the children
10 of those killed in war should come from the public treasury, in the belief that this had not yet been enacted into law by anyone else (though this law is now in force in both Athens and other cities). All the rulers were to be chosen by the populace, and the three parts of the city made up the populace; those selected were to look after common concerns and matters pertaining to foreigners and orphans.

These, then, are most of the particulars of Hippodamus's scheme, and those most worthy of comment. One might first raise a difficulty about his

[8] The Greek word is *hubris*. Its legal meaning is defined by Aristotle in Bk. 1, Chap. 2, of the *Rhetoric* as injury or insult committed out of cruelty in order to cause humiliation as well as harm. Athenian law treated it as a much more serious crime than offenses committed for the sake of gain or revenge, and it could even bring the death penalty.

division of the multitude of citizens. For the craftsmen, farmers, and arms
20 bearers all share in the government, though the farmers have no weapons and the craftsmen neither land nor weapons, so they would practically become slaves of those who possessed the weapons. So for them to share all the offices would be impossible, since the generals, the guardians of the citizens, and what one might call the offices of highest authority would necessarily be appointed from among those bearing arms. But how is it possible for people who have no share in the government to be amicably disposed toward the government? "Well then, those who possess arms will just have to be stronger than the other two parts together." But that is not easy unless there are a lot of them, and if that is going to be the case, why should the others share in the government and have authority in the appointment of the rulers? And how
30 are the farmers of use to the city? Craftsmen would be necessary, since every city has need of craftsmen, and they would be able to survive the way they do in other cities, by their skill. If the farmers were to provide sustenance to those bearing arms they would reasonably have been made a part of the city, but as it is designed, they have private property and they will farm it for private use. And as for the common property from which the city's defenders will get their sustenance, if they are going to farm it them-selves, there would be no difference between the fighting and farming parts, but the lawgiver intends there to be one; and if there are going to be some people who are different
40 from both the private farmers and the fighters, this will be yet a fourth part of the city, sharing in nothing, estranged from their form of government. But if one prescribes that the same people should farm both the private and the
1268B common property, the quantity of the crops from the land each one will farm will be inadequate for two households. Otherwise, why would they not just take their sustenance and supply the fighters too, straight from their own allotments of land? So all these matters have a lot of confusion in them.

And in regard to judging, the law that considers it right to decide cases by making distinctions, even when the charge is made simply, is not beautifully designed either, and the juror becomes an arbitrator. This is admissible in an arbitration, even by a number of people, since they confer with one another about the decision, but it is not possible in lawcourts; most
10 lawmakers even make a provision opposed to this that the jurors should not confer with one another. And then how will the decision not be confused, when a juror supposes the defended owes something, but not the amount the testimony claimed? It claims twenty minae, but the juror decides on ten (or it claims more and he decides on less), while another juror says five and still another four—and it is clear they will divide up in just that way—and some pass sentence for all of it but others for none. What is going to be the method for totaling up the votes? Anyway, nothing forces someone who simply

acquits or condemns to commit perjury if the charge is drawn up simply, and
20 justly so, since the one who acquits is not judging that the accused owes nothing, but that he does not owe the twenty minae; but that person who condemns him without believing he owes the twenty minae is at that point committing perjury.

To make a law that those who discover something advantageous to the city ought to get an honor, though it seems attractive to hear, is not safe; for it has in it the seeds of misrepresentations and, it may so happen, changes in the form of government. But this runs into another problem and a different inquiry, for some people raise the difficulty whether it is harmful or advantageous to cities to change their hereditary laws, if something else is better. This is why it is not easy to go along without further ado with the law
30 that is being spoken of, in case it is not advantageous to change, and it is possible that some people would propose doing away with the laws or the constitution as a matter of common good. And since we have made mention of this, it would be better to go into a little more detail about it. For it has difficulty, as we said, and changing might seem to be better. In the other kinds of knowledge, at any rate, this has been beneficial, for instance for medicine to have changed from its hereditary practices, and gymnastic training as well, and all the arts and skills in general. So since politics too must be counted as one of these, it is clear that there must necessarily be something similar about it as well. And one might claim that a sign of this is right there in the facts
40 themselves, for the ancient laws were overly simplistic and barbaric. For the Greeks used to wear armor, and buy women from one another, and whatever
1269A is left anywhere of the ancient regulations is absolutely silly; in Cyme, for example, there is a law about homicide cases, that if someone bringing an accusation of murder produces a certain number of witnesses out of his own family, the person accused is guilty of murder. And in general, everyone is seeking not what is hereditary but what is good, and it is likely that the first people, whether they were sprung from the earth or survived some disaster, were like run-of-the-mill, unintelligent people, as is, in fact, said about those sprung from the earth, so that it would be absurd to stick to their opinions.

10 In addition to these things, it is not better to leave written laws unchanged either, for just as in the other arts, in a political arrangement too it is impossible to write everything down with precision. For writing is necessarily universal, while actions are concerned with particulars. So it is obvious from these things that some laws ought to be changed at some times, but to those who look at it in another way, this would seem to be a matter for much caution. For when the better thing is something small, since it is bad to get people in the habit of undoing their laws lightly, it is obvious that some errors of the lawgivers and rulers ought to be left alone. For one will not be

benefitted as much by the changes as harmed by being habituated to disobey
20 the rulers. And the precedent from the arts is a false one, for changing an art is not like changing a law; for the law has no strength to be obeyed apart from habit, and this does not come about except through length of time. So to change easily from the existing laws to other, new laws is to make the power of the law weak. And further, even if they ought to be changed, ought all of them to be, and in every form of government, or not? And by any random person, or by which ones? For that makes a big difference. So let us let this inquiry go for now, since it is for other occasions.

Plutarch, *Life of Marcellus*

Sections 9–19 on Archimedes

9 When Hannibal invaded Italy, Marcellus was despatched with a fleet to Sicily. And when the army had been defeated at Canne, and many thousands of them perished, and a few had saved themselves by flying to Canusium, and all feared lest Hannibal, who had destroyed the strength of the Roman army, should advance at once with his victorious troops to Rome, Marcellus first sent for the protection of the city fifteen hundred soldiers from the fleet. Then, by decree of the senate, going to Canusium, having heard that many of the soldiers had come together in that place, he led them out of the fortifications to prevent the enemy from ravaging the country. The chief Roman commanders had most of them fallen in battles; and the citizens complained that the extreme caution of Fabius Maximus, whose integrity and wisdom gave him the highest authority, verged upon timidity and inaction. They confided in him to keep them out of danger, but could not expect that he would enable them to retaliate. Fixing, therefore, their thoughts upon Marcellus, and hoping to combine his boldness, confidence, and promptitude with Fabius's caution and prudence, and to temper the one by the other, they sent, sometimes both with consular command, sometimes one as consul, the other as proconsul, against the enemy. Posidonius writes, that Fabius was called the buckler, Marcellus the sword of Rome. Certainly, Hannibal himself confessed that he feared Fabius as a schoolmaster, Marcellus as an adversary: the former, lest he should be hindered from doing mischief, the latter, lest he should receive harm himself.

10 And first, when among Hannibal's soldiers, proud of their victory, carelessness and boldness had grown to a great height, Marcellus, attacking all their stragglers and plundering parties, cut them off, and by little and little diminished their forces. Then carrying aid to the Neopolitans and Nolans, he confirmed the minds of the former, who, indeed, were of their own accord faithful enough to the Romans; but in Nola he found a state of discord, the senate not being able to rule and keep in the common people, who were generally favourers of Hannibal. There was in the town one Bantius, a man renowned for his high birth and courage. This man, after he had fought most fiercely at Canna, and had killed many of the enemies, at last was found lying in a heap of dead bodies, covered with darts, and was brought to Hannibal, who so honoured him, that he not only dismissed him without ransom, but also contracted friendship with him, and made him his guest. In gratitude for this great favour, he became one of the strongest partisans of Hannibal, and urged the people to revolt. Marcellus could not be induced to put to death a man of such eminence, and who had endured such dangers in fighting on the Roman side; but, knowing himself able, by the general kindliness of his disposition, and in particular by the attractiveness of his address, to gain over a character whose passion was for honour, one day when Bantius saluted him, he asked him who he was; not that he knew him not before, but

seeking an occasion of further conference. When Bantius had told who he was, Marcellus, seeming surprised with joy and wonder, replied: "Are you that Bantius whom the Romans commend above the rest that fought at Canna, and praise as the one man that not only did not forsake the consul Paulus Æmilius, but received in his own body many darts thrown at him?" Bantius, owning himself to be that very man, and showing his scars: "Why, then," said Marcellus, "did not you, having such proofs to show of your affection to us, come to me at my first arrival here? Do you think that we are unwilling to requite with favour those who have well deserved, and who are honoured even by our enemies?" He followed up his courtesies by a present of a war-horse and five hundred drachmas in money. From that time Bantius became the most faithful assistant and ally of Marcellus, and a most keen discoverer of those that attempted innovation and sedition.

11 These were many, and had entered into a conspiracy to plunder the baggage of the Romans, when they should make an irruption against the enemy. Marcellus, therefore, having marshalled his army within the city, placed the baggage near to the gates, and, by an edict, forbade the Nolans to go to the walls. Thus, outside the city, no arms could be seen; by which prudent device he allured Hannibal to move with his army in some disorder to the city, thinking that things were in a tumult there. Then Marcellus, the nearest gate being, as he had commanded, thrown open, issuing forth with the flower of his horse in front, charged the enemy. By and by the foot, sallying out of another gate, with a loud shout joined in the battle. And while Hannibal opposes part of his forces to these, the third gate also is opened, out of which the rest break forth, and on all quarters fall upon the enemies, who were dismayed at this unexpected encounter, and did but feebly resist those with whom they had been first engaged, because of their attack by these others who sallied out later. Here Hannibal's soldiers, with much bloodshed and many wounds, were beaten back to their camp, and for the first time turned their backs to the Romans. There fell in this action, as it is related, more than five thousand of them; of the Romans, not above five hundred. Livy does not affirm that either the victory or the slaughter of the enemy was so great; but certain it is that the adventure brought great glory to Marcellus, and to the Romans, after their calamities, a great revival of confidence, as they began now to entertain a hope that the enemy with whom they contended was not invincible, but liable like themselves to defeats.

12 Therefore, the other consul being deceased, the people recalled Marcellus, that they might put him into his place; and, in spite of the magistrates, succeeded in postponing the election till his arrival, when he was by all the suffrages created consul. But because it happened to thunder, the augurs accounting that he was not legitimately created, and yet not daring, for fear of the people, to declare their sentence openly, Marcellus voluntarily resigned the consulate, retaining however his command. Being created proconsul, and returning to the camp at Nola, he

proceeded to harass those that followed the party of the Carthaginians; on whose coming with speed to succour them, Marcellus declined a challenge to a set battle, but when Hannibal had sent out a party to plunder, and now expected no fight, he broke out upon him with his army. He had distributed to the foot long lances, such as are commonly used in naval fights; and instructed them to throw them with great force at convenient distances against the enemies, who were inexperienced in that way of darting, and used to fight with short darts hand to hand. This seems to have been the cause of the total rout and open flight of all the Carthaginians who were then engaged; there fell of them five thousand; four elephants were killed, and two taken; but what was of the greatest moment, on the third day after, more than three hundred horse, Spaniards and Numidians mixed, deserted to him, a disaster that had never to that day happened to Hannibal, who had kept together in harmony an army of barbarians, collected out of many various and discordant nations. Marcellus and his successors in all this war made good use of the faithful service of these horsemen.

13 He now was a third time created consul, and sailed over into Sicily. For the success of Hannibal had excited the Carthaginians to lay claim to that whole island; chiefly because, after the murder of the tyrant Hieronymus, all things had been in tumult and confusion at Syracuse. For which reason the Romans also had sent before to that city a force under the conduct of Appius, as pretor. While Marcellus was receiving that army, a number of Roman soldiers cast themselves at his feet, upon occasion of the following calamity. Of those that survived the battle at Canne, some had escaped by flight, and some were taken alive by the enemy; so great a multitude, that it was thought there were not remaining Romans enough to defend the wall of the city. And yet the magnanimity and constancy of the city was such, that it would not redeem the captives from Hannibal, though it might have done so for a small ransom; a decree of the senate forbade it, and chose rather to leave them to be killed by the enemy, or sold out of Italy; and commanded that all who had saved themselves by flight should be transported into Sicily, and not permitted to return into Italy, until the war with Hannibal should be ended. These, therefore, when Marcellus was arrived in Sicily, addressed themselves to him in great numbers; and casting themselves at his feet, with much lamentation and tears humbly besought him to admit them to honourable service; and promised to make it appear by their future fidelity and exertions that that defeat had been received rather by misfortune than by cowardice. Marcellus, pitying them, petitioned the senate by letters, that he might have leave at all times to recruit his legions out of them. After much debate about the thing, the senate decreed they were of opinion that the commonwealth did not require the service of cowardly soldiers; if Marcellus perhaps thought otherwise, he might make use of them, provided no one of them be honoured on any occasion with a crown or military gift, as a reward of his virtue or courage. This decree stung Marcellus; and on his return to Rome, after the Sicilian war was ended, he upbraided the senate that they had denied to

him, who had so highly deserved of the republic, liberty to relieve so great a number of citizens in great calamity.

14 At this time Marcellus, first incensed by injuries done him by Hippocrates, commander of the Syracusans (who, to give proof of his good affection to the Carthaginians, and to acquire the tyranny to himself, had killed a number of Romans at Leontini), besieged and took by force the city of Leontini; yet violated none of the townsmen; only deserters, as many as he took, he subjected to the punishment of the rods and axe. But Hippocrates, sending a report to Syracuse, that Marcellus had put all the adult population to the sword, and then coming upon the Syracusans, who had risen in tumult upon that false report, made himself master of the city. Upon this Marcellus moved with his whole army to Syracuse, and encamping near the wall, sent ambassadors into the city to relate to the Syracusans the truth of what had been done in Leontini. When these could not prevail by treaty, the whole power being now in the hands of Hippocrates, he proceeded to attack the city both by land and by sea. The land forces were conducted by Appius: Marcellus, with sixty galleys, each with five rows of oars, furnished with all sorts of arms and missiles, and a huge bridge of planks laid upon eight ships chained together, upon which was carried the engine to cast stones and darts, assaulted the walls, relying on the abundance and magnificence of his preparations, and on his own previous glory; all which, however, were, it would seem, but trifles for Archimedes and his machines.

These machines he had designed and contrived, not as matters of any importance, but as mere amusements in geometry; in compliance with King Hiero's desire and request, some little time before, that he should reduce to practice some part of his admirable speculation in science, and by accommodating the theoretic truth to sensation and ordinary use, bring it more within the appreciation of the people in general. Eudoxus and Archytas had been the first originators of this far-famed and highly-prized art of mechanics, which they employed as an elegant illustration of geometrical truths, and as means of sustaining experimentally, to the satisfaction of the senses, conclusions too intricate for proof by words and diagrams. As, for example, to solve the problem, so often required in constructing geometrical figures, given the two extremes, to find the two mean lines of a proportion, both these mathematicians had recourse to the aid of instruments, adapting to their purpose certain curves and sections of lines. But what with Plato's indignation at it, and his invectives against it as the mere corruption and annihilation of the one good of geometry which was thus shamefully turning its back upon the unembodied objects of pure intelligence to recur to sensation, and to ask help (not to be obtained without base supervisions and depravation) from matter; so it was that mechanics came to be separated from geometry, and, repudiated and neglected by philosophers, took its place as a military art. Archimedes, however, in writing to King Hiero, whose friend and near

relation he was, had stated that given the force, any given weight might be moved, and even boasted, we are told, relying on the strength of demonstration, that if there were another earth, by going into it he could remove this. Hiero being struck with amazement at this, and entreating him to make good this problem by actual experiment, and show some great weight moved by a small engine, he fixed accordingly upon a ship of burden out of the king's arsenal, which could not be drawn out of the dock without great labour and many men; and, loading her with many passengers and a full freight, sitting himself the while far off, with no great endeavour, but only holding the head of the pulley in his hand and drawing the cords by degrees, he drew the ship in a straight line, as smoothly and evenly as if she had been in the sea. The king, astonished at this, and convinced of the power of the art, prevailed upon Archimedes to make him engines accommodated to all the purposes, offensive and defensive, of a siege. These the king himself never made use of, because he spent almost all his life in a profound quiet and the highest affluence. But the apparatus was, in most opportune time, ready at hand for the Syracusans, and with it also the engineer himself.

15 When, therefore, the Romans assaulted the walls in two places at once, fear and consternation stupefied the Syracusans, believing that nothing was able to resist that violence and those forces. But when Archimedes began to ply his engines, he at once shot against the land forces all sorts of missile weapons, and immense masses of stone that came down with incredible noise and violence; against which no man could stand; for they knocked down those upon whom they fell in heaps, breaking all their ranks and files. In the meantime huge poles thrust out from the walls over the ships sunk some by the great weights which they let down from on high upon them; others they lifted up into the air by an iron hand or beak like a crane's beak and, when they had drawn them up by the prow, and set them on end upon the poop, they plunged them to the bottom of the sea; or else the ships, drawn by engines within, and whirled about, were dashed against steep rocks that stood jutting out under the walls, with great destruction of the soldiers that were aboard them. A ship was frequently lifted up to a great height in the air (a dreadful thing to behold), and was rolled to and fro, and kept swinging, until the mariners were all thrown out, when at length it was dashed against the rocks, or let fall. At the engine that Marcellus brought upon the bridge of ships, which was called Sambuca, from some resemblance it had to an instrument of music, while it was as yet approaching the wall, there was discharged a piece of rock of ten talents weight, then a second and a third, which, striking upon it with immense force and a noise like thunder, broke all its foundation to pieces, shook out all its fastenings, and completely dislodged it from the bridge. So Marcellus, doubtful what counsel to pursue, drew off his ships to a safer distance, and sounded a
16 retreat to his forces on land. They then took a resolution of coming up under the walls, if it were possible, in the night; thinking that as Archimedes used ropes stretched at length in playing his engines, the soldiers would now be under the

shot, and the darts would, for want of sufficient distance to throw them, fly over their heads without effect. But he, it appeared, had long before framed for such occasions engines accommodated to any distance, and shorter weapons; and had made numerous small openings in the walls, through which, with engines of a shorter range, unexpected blows were inflicted on the assailants. Thus, when they who thought to deceive the defenders came close up to the walls, instantly a shower of darts and other missile weapons was again cast upon them. And when stones came tumbling down perpendicularly upon their heads, and, as it were, the whole wall shot out arrows at them, they retired. And now, again, as they were going off, arrows and darts of a longer range inflicted a great slaughter among them, and their ships were driven one against another; while they themselves were not able to retaliate in any way. For Archimedes had provided and fixed most of his engines immediately under the wall; whence the Romans, seeing that indefinite mischief overwhelmed them from no visible means, began to think they were fighting with the gods.

17 Yet Marcellus escaped unhurt, and deriding his own artificers and engineers, "What," said he, "must we give up fighting with this geometrical Briareus, who plays pitch-and-toss with our ships, and, with the multitude of darts which he showers at a single moment upon us, really outdoes the hundred-handed giants of mythology?" And doubtless, the rest of the Syracusans were but the body of Archimedes's designs, one soul moving and governing all; for, laying aside all other arms, with this alone they infested the Romans and protected themselves. In fine, when such terror had seized upon the Romans, that, if they did but see a little rope or piece of wood from the wall, instantly crying out, that there it was again, Archimedes was about to let fly some engine at them, they turned their backs and fled, Marcellus desisted from conflicts and assaults, putting all his hope in a long siege. Yet Archimedes possessed so high a spirit, so profound a soul, and such treasures of scientific knowledge, that though these inventions had now obtained him the renown of more than human sagacity, he yet would not deign to leave behind him any commentary or writing on such subjects; but, repudiating as sordid and ignoble the whole trade of engineering, and every sort of art that lends itself to mere use and profit, he placed his whole affection and ambition in those purer speculations where there can be no reference to the vulgar needs of life; studies, the superiority of which to all others is unquestioned, and in which the only doubt can be whether the beauty and grandeur of the subjects examined, of the precision and cogency of the methods and means of proof, most deserve our admiration. It is not possible to find in all geometry more difficult and intricate questions, or more simple and lucid explanations. Some ascribe this to his natural genius; while others think that incredible effort and toil produced these, to all appearances, easy and unlaboured results. No amount of investigation of yours would succeed in attaining the proof, and yet, once seen, you immediately believe you would have discovered it; by so smooth and so rapid a path he leads you to

the conclusion required. And thus it ceases to be incredible that (as is commonly told of him) the charm of his familiar and domestic Siren made him forget his food and neglect his person, to that degree that when he was occasionally carried by absolute violence to bathe or have his body anointed, he used to trace geometrical figures in the ashes of the fire, and diagrams in the oil on his body, being in a state of entire preoccupation, and, in the truest sense, divine possession with his love and delight in science. His discoveries were numerous and admirable; but he is said to have requested his friends and relations that, when he was dead, they would place over his tomb a sphere containing a cylinder, inscribing it with the ratio which the containing solid bears to the contained.

18 Such was Archimedes, who now showed himself, and so far as lay in him the city also, invincible. While the siege continued, Marcellus took Megara, one of the earliest founded of the Greek cities in Sicily, and capturing also the camp of Hippocrates at Acile, killed above eight thousand men, having attacked them whilst they were engaged in forming their fortifications. He overran a great part of Sicily; gained over many towns from the Carthaginians, and overcame all that dared to encounter him. As the siege went on, one Damippus, a Lacedæmonian, putting to sea in a ship from Syracuse, was taken. When the Syracusans much desired to redeem this man, and there were many meetings and treaties about the matter betwixt them and Marcellus, he had opportunity to notice a tower into which a body of men might be secretly introduced, as the wall near to it was not difficult to surmount, and it was itself carelessly guarded. Coming often thither, and entertaining conferences about the release of Damippus, he had pretty well calculated the height of the tower, and got ladders prepared. The Syracusans celebrated a feast to Diana; this juncture of time, when they were given up entirely to wine and sport, Marcellus laid hold of, and before the citizens perceived it, not only possessed himself of the tower, but, before the break of day, filled the wall around with soldiers, and made his way into the Hexapylum. The Syracusans now beginning to stir, and to be alarmed at the tumult, he ordered the trumpets everywhere to sound, and thus frightened them all into flight, as if all parts of the city were already won, though the most fortified, and the fairest, and most ample quarter was still ungained. It is called Acradina, and was divided by a wall from
19 the outer city, one part of which they call Neapolis, the other Tycha. Possessing himself of these, Marcellus, about break of day, entered through the Hexapylum, all his officers congratulating him. But looking down from the higher places upon the beautiful and spacious city below, he is said to have wept much, commiserating the calamity that hung over it, when his thoughts represented to him how dismal and foul the face of the city would be in a few hours, when plundered and sacked by the soldiers. For among the officers of his army there was not one man that durst deny the plunder of the city to the soldiers' demands; nay, many were instant that it should be set on fire and laid level to the ground: but this Marcellus would not listen to. Yet he granted, but with great unwillingness and reluctance, that the

money and slaves should be made prey; giving orders, at the same time, that none should violate any free person, nor kill, misuse, or make a slave of any of the Syracusans. Though he had used this moderation, he still esteemed the condition of that city to be pitiable, and, even amidst the congratulations and joy, showed his strong feelings of sympathy and commiseration at seeing all the riches accumulated during a long felicity now dissipated in an hour. For it is related that no less prey and plunder was taken here than afterward in Carthage. For not long after they obtained also the plunder of the other parts of the city, which were taken by treachery; leaving nothing untouched but the king's money, which was brought into the public treasury. But nothing afflicted Marcellus so much as the death of Archimedes, who was then, as fate would have it, intent upon working out some problem by a diagram, and having fixed his mind alike and his eyes upon the subject of his speculation, he never noticed the incursion of the Romans, nor that the city was taken. In this transport of study and contemplation, a soldier, unexpectedly coming up to him, commanded him to follow to Marcellus; which he declining to do before he had worked out his problem to a demonstration, the soldier, enraged, drew his sword and ran him through. Others write that a Roman soldier, running upon him with a drawn sword, offered to kill him; and that Archimedes, looking back, earnestly besought him to hold his hand a little while, that he might not leave what he was then at work upon inconclusive and imperfect; but the soldier, nothing moved by his entreaty, instantly killed him. Others again relate that, as Archimedes was carrying to Marcellus mathematical instruments, dials, spheres, and angles, by which the magnitude of the sun might be measured to the sight, some soldiers seeing him, and thinking that he carried gold in a vessel, slew him. Certain it is that his death was very afflicting to Marcellus; and that Marcellus ever after regarded him that killed him as a murderer; and that he sought for his kindred and honoured them with signal favours.

J.J. Rousseau, *Second Discourse*

Paragraphs 11–18

11 These first advances finally put man in a position to make more rapid ones. The more the mind was enlightened, the more industry was perfected. Soon, ceasing to fall asleep under the first tree or to withdraw into Caves, they discovered some kinds of hatchets of hard, sharp stones, which served to cut wood, scoop out earth, and make huts from branches they later decided to coat with clay and mud. This was the epoch of a first revolution, which produced the establishment and differentiation of families, and which introduced a sort of property—from which perhaps many quarrels and Fights already arose. However, as the stronger were probably the first to make themselves lodgings they felt capable of defending, it is to be presumed that the weak found it quicker and safer to imitate them than to try to dislodge them; and as for those who already had Huts, each man must seldom have sought to appropriate his neighbor's, less because it did not belong to him than because it was of no use to him, and because he could not seize it without exposing himself to a lively fight with the family occupying it.

12 The first developments of the heart were the effect of a new situation, which united husbands and Wives, Fathers and Children in a common habitation. The habit of living together gave rise to the sweetest sentiments known to men: conjugal love and Paternal love. Each family became a little Society all the better united because reciprocal affection and freedom were its only bonds; and it was then that the first difference was established in the way of life of the two Sexes, which until this time had had but one. Women became more sedentary and grew accustomed to tend the Hut and the Children, while the man went to seek their common subsistence. The two Sexes also began, by their slightly softer life, to lose something of their ferocity and vigor. But if each one separately became less suited to combat savage beasts, on the contrary it was easier to assemble in order to resist them jointly.

13 In this new state, with a simple and solitary life, very limited needs, and the implements they had invented to provide for them, since men enjoyed very great leisure, they used it to procure many kinds of commodities unknown to their Fathers; and that was the first yoke they imposed on themselves without thinking about it, and the first source of the evils they prepared for their Descendants. For, besides their continuing thus to soften body and mind, as these commodities had lost almost all their pleasantness through habit, and as they had at the same time degenerated into true needs, being deprived of them became much more cruel than possessing them was sweet; and people were unhappy to lose them without being happy to possess them.

14 At this point one catches a slightly better glimpse of how the use of speech was established or perfected imperceptibly in the bosom of each family; and one

can conjecture further how particular causes could have spread language and accelerated its progress by making it more necessary. Great floods or earthquakes surrounded inhabited Cantons with water or precipices; Revolutions of the Globe detached and broke up portions of the Continent into Islands. One conceives that among men thus brought together and forced to live together, a common Idiom must have been formed sooner than among those who wandered freely in the forests on solid Ground. Thus it is very possible that after their first attempts at Navigation, Islanders brought the use of speech to us; and it is at least very probable that Society and languages came into being on Islands and were perfected there before they were known on the Continent.

15 Everything begins to change its appearance. Men who until this time wandered in the Woods, having adopted a more fixed settlement, slowly come together, unite into different bands, and finally form in each country a particular Nation, unified by morals and character, not by Regulations and Laws but by the same kind of life and foods and by the common influence of Climate. A permanent proximity cannot fail to engender at length some contact between different families. Young people of different sexes live in neighboring Huts; the passing intercourse demanded by Nature soon leads to another kind no less sweet and more permanent through mutual frequentation. People grow accustomed to consider different objects and to make comparisons; imperceptibly they acquire ideas of merit and beauty which produce sentiments of preference. By dint of seeing one another, they can no longer do without seeing one another again. A tender and gentle sentiment is gradually introduced into the soul and at the least obstacle becomes an impetuous fury. Jealousy awakens with love; Discord triumphs, and the gentlest of the passions receives sacrifices of human blood.

16 In proportion as ideas and sentiments follow upon one another and as mind and heart are trained, the human Race continues to be tamed, contacts spread, and bonds are tightened. People grew accustomed to assembling in front of the Huts or around a large Tree; song and dance, true children of love and leisure, became the amusement or rather the occupation of idle and assembled men and women. Each one began to look at the others and to want to be looked at himself, and public esteem had a value. The one who sang or danced the best, the handsomest, the strongest, the most adroit, or the most eloquent became the most highly considered; and that was the first step toward inequality and, at the same time, toward vice. From these first preferences were born on one hand vanity and contempt, on the other shame and envy; and the fermentation caused by these new leavens eventually produced compounds fatal to happiness and innocence.

17 As soon as men had begun to appreciate one another, and the idea of consideration was formed in their minds, each one claimed a right to it, and it was no longer possible to be disrespectful toward anyone with impunity. From this came the first duties of civility, even among Savages; and from this any voluntary

wrong became an outrage, because along with the harm that resulted from the injury, the offended man saw in it contempt for his person which was often more unbearable than the harm itself. Thus, everyone punishing the contempt shown him by another in a manner proportionate to the importance he accorded himself, vengeances became terrible, and men bloodthirsty and cruel. This is precisely the point reached by most of the Savage Peoples known to us, and it is for want of having sufficiently distinguished between ideas and noticed how far these Peoples already were from the first state of Nature that many have hastened to conclude that man is naturally cruel, and that he needs Civilization in order to make him gentler. On the contrary, nothing is so gentle as man in his primitive state when, placed by Nature at equal distances from the stupidity of brutes and the fatal enlightenment of Civil man, and limited equally by instinct and reason to protecting himself from the harm that threatens him, he is restrained by Natural pity from harming anyone himself, and nothing leads him to do so even after he has received harm. For, according to the axiom of the wise Locke, where there is no property, there is no injury.

18 But it must be noted that the beginnings of Society and the relations already established among men required in them qualities different from those they derived from their primitive constitution; that, morality beginning to be introduced into human Actions, and each man, prior to Laws, being sole judge and avenger of the offenses he had received, the goodness suitable for the pure state of Nature was no longer that which suited nascent Society; that it was necessary for punishments to become more severe as the occasions for offense became more frequent; and that it was up to the terror of revenge to take the place of the restraint of Laws. Thus although men had come to have less endurance and although natural pity had already undergone some alteration, this period of the development of human faculties, maintaining a golden mean between the indolence of the primitive state and the petulant activity of our amour propre, must have been the happiest and most durable epoch. The more one thinks about it, the more one finds that this state was the least subject to revolutions, the best for man[XV], and that he must have come out of it only by some fatal accident, which for the common utility ought never to have happened. The example of Savages, who have almost all been found at this point, seems to confirm that the human Race was made to remain in it always; that this state is the veritable youth of the World; and that all subsequent progress has been in appearance so many steps toward the perfection of the individual, and in fact toward the decrepitude of the species.

[XV] *Amour-propre* and love of oneself (*amour de soi-meme*), two passions very different in their Nature and their effects, must not be confused. Love of oneself is a natural sentiment which inclines every animal to watch over its own preservation, and which, directed in man by reason and modified by pity, produces humanity and virtue. *Amour-propre* is only a relative sentiment, artificial and born in Society, which inclines each individual to have a greater esteem for himself than for anyone else, inspires in men all the harm they do to one another, and is the true source of honor.

This being well understood, I say that in our primitive state, in the genuine state of Nature, *amour-propre* does not exist; for each particular man regarding himself as the sole Spectator to observe him, as the sole being in the universe to take an interest in him, and as the sole judge of his own merit, it is not possible that a sentiment having its source in comparisons he is not capable of making could spring up in his soul. For the same reason this man could have neither hate nor desire for revenge, passions that can arise only from the opinion that some offense has been received; and as it is scorn or intention to hurt and not the harm that constitutes the offense, men who know neither how to evaluate themselves nor compare themselves can do each other a great deal of mutual violence when they derive some advantage from it, without ever offending one another. In a word, every man, seeing his fellows hardly otherwise than he would see Animals of another species, can carry off the prey of the weaker or relinquish his own to the stronger, without considering these plunderings as anything but natural events, without the slightest emotion of insolence or spite, and with no other passion than the sadness or joy of a good or bad outcome.

Translation by Roger Masters

Neil Postman, *Technopoly*

Chapter 2: Tools to Technocracy, pp. 21–25

AMONG the famous aphorisms from the troublesome pen of Karl Marx is his remark in *The Poverty of Philosophy* that the "hand-loom gives you society with the feudal lord; the steam-mill, society with the industrial capitalist." As far as I know, Marx did not say which technology gives us the technocrat, and I am certain his vision did not include the emergence of the Technopolist. Nonetheless, the remark is useful. Marx understood well that, apart from their economic implications, technologies create the ways in which people perceive reality, and that such ways are the key to understanding diverse forms of social and mental life. In *The German Ideology*, he says, "As individuals express their life, so they are," which sounds as much like Marshall McLuhan or, for that matter, Thamus as it is possible to sound. Indeed, toward the end of that book, Marx includes a remarkable paragraph that would be entirely at home in McLuhan's *Understanding Media*. "Is Achilles possible," he asks, "when powder and shot have been invented? And is the Iliad possible at all when the printing press and even printing machines exist? Is it not inevitable that with the emergence of the press, the singing and the telling and the muse cease; that is, the conditions for epic poetry disappear?"[9]

By connecting technological conditions to symbolic life and psychic habits, Marx was doing nothing unusual. Before him, scholars found it useful to invent taxonomies of culture based on the technological character of an age. And they do it still, for the practice is something of a persistent scholarly industry. We think at once of the best-known classification: the Stone Age, the Bronze Age, the Iron Age, the Steel Age. We speak easily of the Industrial Revolution, a term popularized by Amold Toynbee, and, more recently, of the Post-Industrial Revolution, so named by Daniel Bell. Oswald Spengler wrote of the Age of Machine Technics, and C. S. Peirce called the nineteenth century the Railway Age. Lewis Mumford, looking at matters from a longer perspective, gave us the Eotechnic, the Paleotechnic, and the Neotechnic Ages. With equally telescopic perspective, José Ortega y Gasset wrote of three stages in the development of technology: the age of technology of chance, the age of technology of the artisan, the age of technology of the technician. Walter Ong has written about Oral cultures, Chirographic cultures, Typographic cultures, and Electronic cultures. McLuhan himself introduced the phrase "the Age of Gutenberg" (which, he believed, is now replaced by the Age of Electronic Communication).

I find it necessary, for the purpose of clarifying our present situation and indicating what dangers lie ahead, to create still another taxonomy. Cultures may be classified into three types: tool-using cultures, technocracies, and technopolies. At the present time, each type may be found somewhere on the planet, although the first is

[9] Marx, p. 150

rapidly disappearing: we must travel to exotic places to find a tool-using culture.[10] If we do, it is well to go armed with the knowledge that, until the seventeenth century, all cultures were tool-users. There was, of course, considerable variation from one culture to another in the tools that were available. Some had only spears and cooking utensils. Some had water mills and coal- and horsepower. But the main characteristic of all tool-using cultures is that their tools were largely invented to do two things: to solve specific and urgent problems of physical life, such as in the use of waterpower, wind-mills, and the heavy-wheeled plow; or to serve the symbolic world of art, politics, myth, ritual, and religion, as in the construction of castles and cathedrals and the development of the mechanical clock. In either case, tools did not attack (or, more precisely, were not intended to attack) the dignity and integrity of the culture into which they were introduced. With some exceptions, tools did not prevent people from believing in their traditions, in their God, in their politics, in their methods of education, or in the legitimacy of their social organization. These beliefs, in fact, *directed* the invention of tools and limited the uses to which they were put. Even in the case of military technology, spiritual ideas and social customs acted as controlling forces. It is well known, for example, that the uses of the sword by samurai warriors were meticulously governed by a set of ideals known as Bushido, or the Way of the Warrior. The rules and rituals specifying when, where, and how the warrior must use either of his two swords (the *katana*, or long sword, and the *wakizashi*, or short sword) were precise, tied closely to the concept of honor, and included the requirement that the warrior commit seppuku or hara-kiri should his honor be compromised. This sort of governance of military technology was not unknown in the Western world. The use of the lethal crossbow was prohibited, under threat of anathema, by Pope Innocent Il in the early twelfth century. The weapon was judged to be "hateful to God" and therefore could not be used against Christians. That it could be used against Muslims and other infidels does not invalidate the point that in a tool-using culture technology is not seen as autonomous, and is subject to the jurisdiction of some binding social or religious system.

Having defined tool-using cultures in this manner, I must add two points so as to avoid excessive oversimplification. First, the quantity of technologies available to a tool-using culture is not its defining characteristic. Even a superficial study of the Roman Empire, for example, reveals the extent to which it relied on roads, bridges, aqueducts, tunnels, and sewers for both its economic vitality and its military conquests. Or, to take another example, we know that, between the tenth and thirteenth centu-ries, Europe underwent a technological boom: medieval man was surrounded by machines.[11] One may even go as far as Lynn White, Jr., who said that the Middle Ages gave us for the first time in history "a complex civilization which rested not on the backs of sweating slaves or coolies but primarily on non-human power."[12] Tool-using cultures, in other words,

[10] Perhaps another word for tool-using culture is “third-world country,” although vast parts of China may be included as tool-using.
[11] For a detailed analysis of medieval technology, see Jean Gimpel’s *The Medieval Machine*.
[12] Quoted in Muller, p. 30.

may be both ingenious and productive in solving problems of the physical environment. Windmills were invented in the late twelfth cen-tury. Eyeglasses for nearsightedness appeared in Italy in 1280. The invention in the eleventh century of rigid padded collars to rest on the shoulder blades of horses solved the problem of how to increase the pulling power of horses without decreasing their ability to breathe. In fact, as early as the ninth century in Europe, horseshoes were invented, and someone figured out that, when horses are hitched, one behind the other, their pulling power is enormously amplified. Corn mills, paper mills, and fulling mills were part of medieval culture, as were bridges, castles, and cathedrals. The famous spire of Strasbourg Cathedral, built in the thirteenth century, rose to a height of 466 feet, the equivalent of a forty-story skyscraper. And, to go further back in time, one must not fail to mention the remarkable engineering achievements of Stonehenge and the Pyramids (whose construction, Lewis Mumford insisted, signifies the first example of a megamachine in action).

Given the facts, we must conclude that tool-using cultures are not necessarily impoverished technologically, and may even be surprisingly sophisticated. Of course, some tool-using cultures were (and still are) technologically primitive, and some have even displayed a contempt for crafts and machinery. The Golden Age of Greece, for example, produced no important technical inventions and could not even devise ways of using horsepower efficiently. Both Plato and Aristotle scorned the "base mechanic arts," probably in the belief that nobility of mind was not enhanced by efforts to increase efficiency or productivity. Efficiency and productivity were problems for slaves, not philosophers. We find a somewhat similar view in the Bible, which is the longest and most detailed account of an ancient tool-using culture we have. In Deuteronomy, no less an authority than God Himself says, "Cursed be the man who makes a graven or molten image, an abomination to the Lord, a thing made by the hands of a craftsman, and sets it up in secret."

Tool-using cultures, then, may have many tools or few, may be enthusiastic about tools or contemptuous. The name "tool-using culture" derives from the relationship in a given culture between tools and the belief system or ideology. The tools are not intruders. They are integrated into the culture in ways that do not pose significant contradictions to its world-view. If we take the European Middle Ages as an example of a tool-using culture, we find a very high degree of integration between its tools and its world-view. Medieval theologians developed an elaborate and systematic description of the relation of man to God, man to nature, man to man, and man to his tools. Their theology took as a first and last principle that all knowledge and goodness come from God, and that therefore all human enterprise must be directed toward the service of God. Theology, not technology, provided people with authorization for what to do or think. Perhaps this is why Leonardo da Vinci kept his design of a submarine secret, believing that it was too harmful a tool to unleash, that it would not gain favor in God's eyes.

Plato, *Republic*

Book II, 368c–376e, The True and Healthy City

368c SOC: "It looks to me as though the investigation we are undertaking is no ordinary thing, but one for a man who sees sharply. Since we're not clever men," *368d* I said, "in my opinion we should make this kind of investigation of it: if someone had, for example, ordered men who don't see very sharply to read little letters from afar and then someone had the thought that the same letters are somewhere else also, but bigger and in a bigger place, I suppose it would look like a godsend to be able to consider the littler ones after having read these first, if, of course, they do happen to be the same."

368e "Most certainly," said Adeimantus. "But, Socrates, what do you notice in the investigation of the just that's like this?"

"I'll tell you," I said. "There is, we say, justice of one man; and there is, surely, justice of a whole city too?"

"Certainly," he said.

"Is a city bigger[13] than one man?"

"Yes, it is bigger;" he said.

"So then, perhaps there would be more justice in the bigger and it would *369a* be easier to observe closely. If you want, first we'll investigate what justice is like in the cities. Then, we'll also go on to consider it in individuals, considering the likeness of the bigger in the idea[14] of the littler?"

"What you say seems fine to me," he said.

"If we should watch a city coming into being in speech," I said, "would we also see its justice coming into being, and its injustice?"

"Probably," he said.

369b "When this has been done, can we hope to see what we're looking for more easily?"

"Far more easily."

"Is it resolved[15] that we must try to carry this out? I suppose it's no small job, so consider it."

"It's been considered," said Adeimantus. "Don't do anything else."

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[13] This could also mean "more important."
[14] "Idea" is merely a transliteration of the Greek; it is of the same family as *eidos* and frequently seems to be identical in meaning in Plato's usage. There is, however, a nuance of difference. Primarily, "idea" is closer to the root verb and accentuates the notion of a thing's being seen or its looks.
[15] Cf. 328b, note 6.

"Well, then," I said, "a city, as I believe, comes into being because each of us isn't self-sufficient but is in need of much. Do you believe there's another beginning to the founding of a city?"

"None at all," he said.

369c "So, then, when one man takes on another, for one need and another for another need, and, since many things are needed, many men gather in one settlement as partners and helpers, to this common settlement we give the name city, don't we?"

"Most certainly."

"Now, does one man give a share to another, if he does give a share, or take a share, in the belief that it's better for himself?"

"Certainly."

"Come, now," I said, "let's make a city in speech from the beginning. Our need, as it seems, will make it."

"Of course."

369d "Well, now, the first and greatest of needs is the provision of food for existing and living."

"Certainly."

"Second, of course, is housing, and third, clothing, and such."

"That's so."

"Now wait," I said. "How will the city be sufficient to provide for this much? Won't one man be a farmer, another the housebuilder, and still another, a weaver? Or shall we add to it a shoemaker or some other man who cares for what has to do with the body?"

"Certainly."

"The city of utmost necessity[16] would be made of four or five men."

369e "It looks like it."

"Now, what about this? Must each one of them put his work at the disposition of all in common—for example, must the farmer, one man, provide food for four and spend four times as much time and labor in the provision of food and then give it in common to the others; or must he neglect them and *370a* produce a fourth part of the food in a fourth part of the time and use the other

[16] The superlative of the word for necessity here can be construed to mean: (1) this city is composed of the fewest elements possible; (2) this city is most oppressed by necessity, or is most necessitous; or (3) this city is the proper one, the one most needed.

three parts for the provision of a house, clothing,[17] and shoes, not taking the trouble to share in common with others, but minding his own business for himself?"

And Adeimantus said, "Perhaps, Socrates, the latter is easier than the former.

"It wouldn't be strange, by Zeus," I said. "I myself also had the thought when you spoke that, in the first place, each of us is naturally not quite like
370b anyone else, but rather differs in his nature; different men are apt for the accomplishment of different jobs. Isn't that your opinion?"

"It is."

"And, what about this? Who would do a finer job, one man practicing many arts, or one man one art?"

"One man, one art," he said.

"And, further, it's also plain, I suppose, that if a man lets the crucial moment in any work pass, it is completely ruined."

"Yes, it is plain."

"I don't suppose the thing done is willing to await the leisure of the man
370c who does it; but it's necessary for the man who does it to follow close upon the thing done, and not as a spare-time occupation."

"It is necessary."

"So, on this basis each thing becomes more plentiful, finer, and easier, when one man, exempt from other tasks, does one thing according to nature and at the crucial moment."

"That's entirely certain."

"Now, then, Adeimantus, there's need of more citizens than four for the provisions of which we were speaking. For the farmer, as it seems, won't make
370d his own plow himself, if it's going to be a fine one, or his hoe, or the rest of the tools for farming; and the housebuilder won't either—and he needs many too. And it will be the same with the weaver and the shoemaker, won't it?"

"True."

"So, carpenters, smiths, and many other craftsmen of this sort become partners in our little city, making it into a throng."

"Most certainly."

"But it wouldn't be very big yet, if we added cowherds, shepherds, and the other kinds of herdsmen, so that the farmers would have oxen for plowing,

[17] The word is *himation* and means a specific sort of loose-fitting outer robe usually worn over undergarments. It was an oblong piece of cloth thrown over the left shoulder and fastened over or under the right. It is familiarly seen on Greek statues.

370e the housebuilders teams to use with the farmers for hauling, and the weavers and cobblers hides and wool."

"Nor would it be a little city," he said, "when it has all this."

"And, further," I said, "just to found the city itself in the sort of place where there will be no need of imports is pretty nearly impossible."

"Yes, it is impossible."

"Then, there will also be a need for still other men who will bring to it what's needed from another city."

"Yes, they will be needed."

"Now, if the agent comes empty-handed, bringing nothing needed by
371a those from whom they take what they themselves need, he'll go away empty-handed, won't he?"

"It seems so to me."

"Then they must produce at home not only enough for themselves but also the sort of thing and in the quantity needed by these others of whom they have need."

"Yes, they must."

"So our city needs more farmers and other craftsmen."

"It does need more."

"And similarly, surely, other agents as well, who will import and export the various products. They are merchants, aren't they?"

"Yes."

"Then, we'll need merchants too."

"Certainly."

371b "And if the commerce is carried on by sea, there will also be need of throngs of other men who know the business of the sea."

"Throngs, indeed."

"Now what about this? In the city itself, how will they exchange what they have produced with one another? It was for just this that we made a partnership and founded the city."

"Plainly," he said, "by buying and selling."

"Out of this we'll get a market[18] and an established currency[19] as a token for exchange."

"Most certainly."

371c "If the farmer or any other craftsman brings what he has produced to the market, and he doesn't arrive at the same time as those who need what he has to exchange, will he sit in the market idle, his craft unattended?"

"Not at all," he said. "There are men who see this situation and set themselves to this service; in rightly governed cities they are usually those whose
371d bodies are weakest and are useless for doing any other job. They must stay there in the market and exchange things for money with those who need to sell something and exchange, for money again, with all those who need to buy something."

"This need, then, produces tradesmen in our city," I said. "Don't we call tradesmen those men who are set up in the market to serve in buying and selling, and merchants those who wander among the cities?"

"Most certainly."

371e "There are, I suppose, still some other servants who, in terms of their minds, wouldn't be quite up to the level of partnership, but whose bodies are strong enough for labor. They sell the use of their strength and, because they call their price a wage, they are, I suppose, called wage earners, aren't they?"

"Most certainly."

"So the wage earners too, as it seems, go to fill out the city."

"It seems so to me."

"Then has our city already grown to completeness, Adeimantus?"

"Perhaps."

"Where in it, then, would justice and injustice be? Along with which of the things we considered did they come into being?"

372a "I can't think, Socrates," he said, "unless it's somewhere in some need these men have of one another."

"Perhaps what you say is fine," I said. "It really must be considered and we mustn't back away. First, let's consider what manner of life men so provided for will lead. Won't they make bread, wine, clothing, and shoes? And, when they have built houses, they will work in the summer, for the most part naked and
372b without shoes, and in the winter adequately clothed and shod. For food they will

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[18] The word for "market" is *agora*. The agora was the central meeting place in the city and the haunt of Socrates, according to his own account.

[19] The word for "currency" is *nomisma*. It means something conventional and is derived from the word *nomos*. A strictly literal translation would be "a conventional [or legal] sign of exchange." It is to be noted that the first mention of convention, as opposed to nature, within the city has to do with commerce.

prepare barley meal and wheat flour; they will cook it and knead it. Setting out noble loaves of barley and wheat on some reeds or clean leaves, they will stretch out on rushes strewn with yew and myrtle and feast themselves and their children. Afterwards they will drink wine and, crowned with wreathes, sing of the gods. So they will have sweet intercourse with one another, and not produce
372c children beyond their means, keeping an eye out against poverty or war."

And Glaucon interrupted, saying: "You seem to make these men have their feast without relishes."

"What you say is true," I said. "I forgot that they'll have relishes, too—it's plain they'll have salt, olives, cheese; and they will boil onions and greens, just as one gets them in the country. And to be sure, we'll set desserts before them—figs,
372d pulse and beans; and they'll roast myrtle-berries and acorns before the fire and drink in measure along with it. And so they will live out their lives in peace with health, as is likely, and at last, dying as old men, they will hand down other similar lives to their offspring."

And he said, "If you were providing for a city of sows, Socrates, on what else would you fatten them than this?"

"Well, how should it be, Glaucon?" I said.

"As is conventional," he said. "I suppose men who aren't going to be
372e wretched recline on couches[20] and eat from tables and have relishes and desserts just like men have nowadays."

"All right," I said. "I understand. We are, as it seems, considering not only how a city, but also a luxurious city, comes into being. Perhaps that's not bad either. For in considering such a city too, we could probably see in what way justice and injustice naturally grow in cities. Now, the true[21] city is in my opinion the one we just described—a healthy city, as it were. But, if you want to, let's look at a feverish city, too. Nothing stands in the way. For these things, as it seems, won't satisfy some, or this way of life, but couches, tables, and other furniture
373a will be added, and, of course, relishes, perfume, incense, courtesans and cakes—all sorts of all of them. And, in particular, we can't still postulate the mere necessities we were talking about at first—houses, clothes, and shoes; but painting and embroidery must also be set in motion; and gold, ivory, and everything of the sort must be obtained. Isn't that so?"

373b "Yes," he said.

"Then the city must be made bigger again. This healthy one isn't adequate any more, but must already be gorged with a bulky mass of things, which are not in cities because of necessity—all the hunters and imitators, many concerned

[20] The Greek meal was eaten in a reclining posture; usually the individuals would support themselves on one elbow. For this purpose the well-to-do Athenian had special low couches with cushions.
[21] Or "truthful."

with figures and colors, many with music; and poets and their helpers, rhapsodes, actors, choral dancers, contractors, and craftsmen of all sorts of
373c equipment, for feminine adornment as well as other things. And so we'll need more servants too. Or doesn't it seem there will be need of teachers, wet nurses, governesses, beauticians, barbers, and, further, relish-makers and cooks? And, what's more, we're in addition going to need swineherds. This animal wasn't in our earlier city—there was no need—but in this one there will be need of it in addition. And there'll also be need of very many other fatted beasts if someone will eat them, won't there?"

"Of course."

373d "Won't we be in much greater need of doctors if we follow this way of life rather than the earlier one?"

"Much greater."

"And the land, of course, which was then sufficient for feeding the men who were then, will now be small although it was sufficient. Or how should we say it?"

"Like that," he said.

"Then must we cut off a piece of our neighbors' land, if we are going to have sufficient for pasture and tillage, and they in turn from ours, if they let themselves go to the unlimited acquisition of money, overstepping the boundary of the necessary?"

373e "Quite necessarily, Socrates," he said.

"After that won't we go to war as a consequence, Glaucon? Or how will it be?"

"Like that," he said.

"And let's not yet say whether war works evil or good," I said, "but only this much, that we have in its turn found the origin of war—in those things whose presence in cities most of all produces evils both private and public."

"Most certainly."

"Now, my friend, the city must be still bigger, and not by a small number
374a but by a whole army, which will go out and do battle with invaders for all the wealth and all the things we were just now talking about."

"What," he said, "aren't they adequate by themselves?"

"Not if that was a fine agreement you and all we others made when we were fashioning the city," I said. "Surely we were in agreement, if you remember, that it's impossible for one man to do a fine job in many arts."

"What you say is true," he said.

374b "Well then," I said, "doesn't the struggle for victory in war seem to be a matter for art?"

"Very much so," he said.

"Should one really care for the art of shoemaking more than for the art of war?"

"Not at all."

"But, after all, we prevented the shoemaker from trying at the same time to be a farmer or a weaver or a housebuilder; he had to stay a shoemaker just so the shoemaker's art would produce fine work for us. And in the same way, to each one of the others we assigned one thing, the one for which his nature fitted
374c him, at which he was to work throughout his life, exempt from the other tasks, not letting the crucial moments pass, and thus doing a fine job. Isn't it of the greatest importance that what has to do with war be well done? Or is it so easy that a farmer or a shoemaker or a man practicing any other art whatsoever can be at the same time skilled in the art of war, while no one could become an adequate draughts or dice player who didn't practice it from childhood on, but
374d only gave it his spare time? Will a man, if he picks up a shield or any other weapon or tool of war, on that very day be an adequate combatant in a battle of heavy-armed soldiers,[22] or any other kind of battle in war, even though no other tool if picked up will make anyone a craftsman or contestant, nor will it eyen be of use to the man who has not gained knowledge of it or undergone adequate training?"

"In that case," he said, "the tools would be worth a lot."

"Then," I said, "to the extent that the work of the guardians is more
374e important, it would require more leisure time than the other tasks as well as greater art and diligence."

"I certainly think so," he said.

"And also a nature fit for the pursuit?"

"Of course."

"Then it's our job, as it seems, to choose, if we're able, which are the natures, and what kind they are, fit for guarding the city."

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[22] The *hoplite*, or "heavy-armed soldier," who carried a large shield (*hoplon*) and a pike was the most admired and most useful of soldiers. He fought the great land battles in close combat. He is contrasted with light-armed and mounted soldiers who were used to annoy the enemy on the flanks. The capacity to provide oneself with and use such arms was a test for citizenship in limited democratic regimes, like that of 411 B.C. in Athens. From the point of view of wealth and military skill, this distinguished a man from the majority, who were either light-armed soldiers or sailors. Heavy-armed combat was understood to be the most important kind, from the point of view of strategy and as an occasion for the expression of virtue. The Iliad is a hymn to this kind of soldier; in Socrates' time the Spartan was the model of the hoplite.

"Indeed it is our job."

"By Zeus," I said, "it's no mean thing we've taken upon ourselves. But nevertheless, we mustn't be cowardly, at least as far as it's in our power."

375a "No," he said, "we mustn't."

"Do you suppose," I said, "that for guarding there is any difference between the nature of a noble puppy and that of a well-born young man?"

"What do you mean?"

"Well, surely both of them need sharp senses, speed to catch what they perceive, and, finally, strength if they have to fight it out with what they have caught."

"Yes, indeed," he said, "both need all these things."

"To say nothing of courage, if they are to fight well."

"Of course."

"Then, will horse or dog—or any other animal whatsoever—be willing to
375b be courageous if it's not spirited? Haven't you noticed how irresistible and unbeatable spirit[23] is, so that its presence makes every soul fearless and invincible in the face of everything?"

"Yes, I have noticed it."

"As for the body's characteristics, it's plain how the guardian must be."

"Yes."

"And as for the soul's—that he must be spirited."

"That too."

"Glaucon," I said, "with such natures, how will they not be savage to one another and the rest of the citizens?"

"By Zeus," he said, "it won't be easy."

375c "Yet, they must be gentle to their own and cruel to enemies. If not, they'll not wait for others to destroy them, but they'll do it themselves beforehand."

"True," he said.

"What will we do?" I said. "Where will we find a disposition at the same time gentle and great-spirited? Surely a gentle nature is opposed to a spirited one."

"It looks like it."

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[23] The word here is *thymos*, and it expresses one of the most important notions in the book. *Thymos* is the principle or seat of anger or rage. It might well be translated by that pregnant word "heart," which mirrors the complexity of the Greek. It will always be translated as "spirit" or "spiritedness." Its use should be carefully watched.

"Yet, if a man lacks either of them, he can't become a good guardian. But
375d these conditions resemble impossibilities, and so it follows that a good guardian is impossible."

"I'm afraid so," he said.

I too was at a loss, and, looking back over what had gone before, I said, "It is just, my friend, that we're at a loss. For we've abandoned the image we proposed."

"How do you mean?"

"We didn't notice that there are, after all, natures such as we thought impossible, possessing these opposites."

"Where, then?"

375e "One could see it in other animals too, especially, however, in the one we compared to the guardian. You know, of course, that by nature the disposition of noble dogs is to be as gentle as can be with their familiars and people they know and the opposite with those they don't know."

"I do know that."

"Then," I said, "it is possible, after all; and what we're seeking for in the guardian isn't against nature."

"It doesn't seem so."

"In your opinion, then, does the man who will be a fit guardian need, in addition to spiritedness, also to be a philosopher in his nature?"[24]

376a "How's that?" he said. "I don't understand."

"This, too, you'll observe in dogs," I said, "and it's a thing in the beast worthy of our wonder."

"What?"

"When it sees someone it doesn't know, it's angry, although it never had any bad experience with him. And when it sees someone it knows, it greets him warmly, even if it never had a good experience with him. Didn't you ever wonder about this before?"

"No, I haven't paid very much attention to it up to now. But it's plain that it really does this."

376b "Well, this does look like an attractive affection of its nature and truly philosophic."

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[24] The word *philosopher* means "lover of wisdom" and is parallel to *philomāthes*, "lover of learning." These first uses of the term and their context are the first steps toward a definition of that difficult notion. Sometimes it will be translated as "philosopher," at other times as "lover of wisdom"; it is always the same Greek word.

"In what way?"

"In that it distinguishes friendly from hostile looks by nothing other than by having learned the one and being ignorant of the other," I said. "And so, how can it be anything other than a lover of learning since it defines what's its own and what's alien by knowledge and ignorance?"

"It surely couldn't be anything but," he said.

"Well," I said, "but aren't love of learning and love of wisdom the same?"

"Yes, the same," he said.

376c "So shall we be bold and assert that a human being too, if he is going to be gentle to his own and those known to him, must by nature be a philosopher and a lover of learning?"

"Yes," he said, "let's assert it."

"Then the man who's going to be a fine and good[25] guardian of the city for us will in his nature be philosophic, spirited, swift, and strong."

"That's entirely certain," he said.

"Then he would be of this sort to begin with. But how, exactly, will they be reared and educated by us? And does our considering this contribute *376d* anything to our goal of discerning that for the sake of which we are considering all these things—in what way justice and injustice come into being in a city? We don't want to scant the argument, but we don't want an overlong one either."

And Glaucon's brother said, "I most certainly expect that this present consideration will contribute to that goal."

"By Zeus," I said, "then, my dear Adeimantus, it mustn't be given up even if it turns out to be quite long."

"No, it mustn't."

"Come, then, like men telling tales in a tale and at their leisure, let's educate the men in speech."

376e "We must."

Translation and notes by Allan Bloom

[25] This expression is composed of the words *kalos* and *agathos*, the former meaning "fair," "fine," or "noble," and the latter "good." It is the formula for what we would call "the gentleman." Whenever feasible, *kaloskagathos* will be translated as "gentleman."

John Locke, ***Second Treatise***

Chapter 5: On Property

§25 WHETHER we consider natural reason, which tells us, that men, being once born, have a right to their preservation, and consequently to meat and drink, and such other things as nature affords for their subsistence: or revelation, which gives us an account of those grants God made of the world to Adam, and to Noah, and his sons, it is very clear, that God, as king David says, Psal. cxv. 16. has given the earth to the children of men; given it to mankind in common. But this being supposed, it seems to some a very great difficulty, how any one should ever come to have a property in any thing: I will not content myself to answer, that if it be difficult to make out property, upon a supposition that God gave the world to Adam, and his posterity in common, it is impossible that any man, but one universal monarch, should have any property upon a supposition, that God gave the world to Adam, and his heirs in succession, exclusive of all the rest of his posterity. But I shall endeavour to shew, how men might come to have a property in several parts of that which God gave to mankind in common, and that without any express compact of all the commoners.

§26 God, who hath given the world to men in common, hath also given them reason to make use of it to the best advantage of life, and convenience. The earth, and all that is therein, is given to men for the support and comfort of their being. And tho' all the fruits it naturally produces, and beasts it feeds, belong to mankind in common, as they are produced by the spontaneous hand of nature; and no body has originally a private dominion, exclusive of the rest of mankind, in any of them, as they are thus in their natural state: yet being given for the use of men, there must of necessity be a means to appropriate them some way or other, before they can be of any use, or at all beneficial to any particular man. The fruit, or venison, which nourishes the wild Indian, who knows no enclosure, and is still a tenant in common, must be his, and so his, i.e. a part of him, that another can no longer have any right to it, before it can do him any good for the support of his life.

§27 Though the earth, and all inferior creatures, be common to all men, yet every man has a property in his own person: this no body has any right to but himself. The labour of his body, and the work of his hands, we may say, are properly his. Whatsoever then he removes out of the state that nature hath provided, and left it in, he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his property. It being by him removed from the common state nature hath placed it in, it hath by this labour something annexed to it, that excludes the common right of other men: for this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good, left in common for others.

§28 He that is nourished by the acorns he picked up under an oak, or the apples he gathered from the trees in the wood, has certainly appropriated them to himself. No body can deny but the nourishment is his. I ask then, when did they begin to be his? when he digested? or when he eat? or when he boiled? or when he brought them home? or when he picked them up? and it is plain, if the first gathering made them not his, nothing else could. That labour put a distinction between them and common: that added something to them more than nature, the common mother of all, had done; and so they became his private right. And will any one say, he had no right to those acorns or apples, he thus appropriated, because he had not the consent of all mankind to make them his? Was it a robbery thus to assume to himself what belonged to all in common? If such a consent as that was necessary, man had starved, notwithstanding the plenty God had given him. We see in commons, which remain so by compact, that it is the taking any part of what is common, and removing it out of the state nature leaves it in, which begins the property; without which the common is of no use. And the taking of this or that part, does not depend on the express consent of all the commoners. Thus the grass my horse has bit; the turfs my servant has cut; and the ore I have digged in any place, where I have a right to them in common with others, become my property, without the assignation or consent of any body. The labour that was mine, removing them out of that common state they were in, hath fixed my property in them.

§29 By making an explicit consent of every commoner, necessary to any one's appropriating to himself any part of what is given in common, children or servants could not cut the meat, which their father or master had provided for them in common, without assigning to every one his peculiar part. Though the water running in the fountain be every one's, yet who can doubt, but that in the pitcher is his only who drew it out? His labour hath taken it out of the hands of nature, where it was common, and belonged equally to all her children, and hath thereby appropriated it to himself.

§30 Thus this law of reason makes the deer that Indian's who hath killed it; it is allowed to be his goods, who hath bestowed his labour upon it, though before it was the common right of every one. And amongst those who are counted the civilized part of mankind, who have made and multiplied positive laws to determine property, this original law of nature, for the beginning of property, in what was before common, still takes place; and by virtue thereof, what fish any one catches in the ocean, that great and still remaining common of mankind; or what ambergrise any one takes up here, is by the labour that removes it out of that common state nature left it in, made his property, who takes that pains about it. And even amongst us, the hare that any one is hunting, is thought his who pursues her during the chase: for being a beast that is still looked upon as common, and no man's private possession; whoever has employed so much labour about any of that

kind, as to find and pursue her, has thereby removed her from the state of nature, wherein she was common, and hath begun a property.

§31 It will perhaps be objected to this, that if gathering the acorns, or other fruits of the earth, &c. makes a right to them, then any one may ingross as much as he will. To which I answer, Not so. The same law of nature, that does by this means give us property, does also bound that property too. God has given us all things richly, 1 Tim. vi. 12. is the voice of reason confirmed by inspiration. But how far has he given it us? To enjoy. As much as any one can make use of to any advantage of life before it spoils, so much he may by his labour fix a property in: whatever is beyond this, is more than his share, and belongs to others. Nothing was made by God for man to spoil or destroy. And thus, considering the plenty of natural provisions there was a long time in the world, and the few spenders; and to how small a part of that provision the industry of one man could extend itself, and ingross it to the prejudice of others; especially keeping within the bounds, set by reason, of what might serve for his use; there could be then little room for quarrels or contentions about property so established.

§32 But the chief matter of property being now not the fruits of the earth, and the beasts that subsist on it, but the earth itself; as that which takes in and carries with it all the rest; I think it is plain, that property in that too is acquired as the former. As much land as a man tills, plants, improves, cultivates, and can use the product of, so much is his property. He by his labour does, as it were, inclose it from the common. Nor will it invalidate his right, to say every body else has an equal title to it; and therefore he cannot appropriate, he cannot inclose, without the consent of all his fellow-commoners, all mankind. God, when he gave the world in common to all mankind, commanded man also to labour, and the penury of his condition required it of him. God and his reason commanded him to subdue the earth, i.e. improve it for the benefit of life, and therein lay out something upon it that was his own, his labour. He that in obedience to this command of God, subdued, tilled and sowed any part of it, thereby annexed to it something that was his property, which another had no title to, nor could without injury take from him.

§33 Nor was this appropriation of any parcel of land, by improving it, any prejudice to any other man, since there was still enough, and as good left; and more than the yet unprovided could use. So that, in effect, there was never the less left for others because of his enclosure for himself: for he that leaves as much as another can make use of, does as good as take nothing at all. No body could think himself injured by the drinking of another man, though he took a good draught, who had a whole river of the same water left him to quench his thirst: and the case of land and water, where there is enough of both, is perfectly the same.

§34 God gave the world to men in common; but since he gave it them for their benefit, and the greatest conveniencies of life they were capable to draw from it, it cannot be supposed he meant it should always remain common and uncultivated.

He gave it to the use of the industrious and rational, (and labour was to be his title to it;) not to the fancy or covetousness of the quarrelsome and contentious. He that had as good left for his improvement, as was already taken up, needed not complain, ought not to meddle with what was already improved by another's labour: if he did, it is plain he desired the benefit of another's pains, which he had no right to, and not the ground which God had given him in common with others to labour on, and whereof there was as good left, as that already possessed, and more than he knew what to do with, or his industry could reach to.

§35 It is true, in land that is common in England, or any other country, where there is plenty of people under government, who have money and commerce, no one can inclose or appropriate any part, without the consent of all his fellow-commoners; because this is left common by compact, i.e. by the law of the land, which is not to be violated. And though it be common, in respect of some men, it is not so to all mankind; but is the joint property of this country, or this parish. Besides, the remainder, after such enclosure, would not be as good to the rest of the commoners, as the whole was when they could all make use of the whole; whereas in the beginning and first peopling of the great common of the world, it was quite otherwise. The law man was under, was rather for appropriating. God commanded, and his wants forced him to labour. That was his property which could not be taken from him where-ever he had fixed it. And hence subduing or cultivating the earth, and having dominion, we see are joined together. The one gave title to the other. So that God, by commanding to subdue, gave authority so far to appropriate: and the condition of human life, which requires labour and materials to work on, necessarily introduces private possessions.

§36 The measure of property nature has well set by the extent of men's labour and the conveniencies of life: no man's labour could subdue, or appropriate all; nor could his enjoyment consume more than a small part; so that it was impossible for any man, this way, to intrench upon the right of another, or acquire to himself a property, to the prejudice of his neighbour, who would still have room for as good, and as large a possession (after the other had taken out his) as before it was appropriated. This measure did confine every man's possession to a very moderate proportion, and such as he might appropriate to himself, without injury to any body, in the first ages of the world, when men were more in danger to be lost, by wandering from their company, in the then vast wilderness of the earth, than to be straitened for want of room to plant in. And the same measure may be allowed still without prejudice to any body, as full as the world seems: for supposing a man, or family, in the state they were at first peopling of the world by the children of Adam, or Noah; let him plant in some inland, vacant places of America, we shall find that the possessions he could make himself, upon the measures we have given, would not be very large, nor, even to this day, prejudice the rest of mankind, or give them reason to complain, or think themselves injured by this man's incroachment,

though the race of men have now spread themselves to all the corners of the world, and do infinitely exceed the small number was at the beginning. Nay, the extent of ground is of so little value, without labour, that I have heard it affirmed, that in Spain itself a man may be permitted to plough, sow and reap, without being disturbed, upon land he has no other title to, but only his making use of it. But, on the contrary, the inhabitants think themselves beholden to him, who, by his industry on neglected, and consequently waste land, has increased the stock of corn, which they wanted. But be this as it will, which I lay no stress on; this I dare boldly affirm, that the same rule of propriety, (viz.) that every man should have as much as he could make use of, would hold still in the world, without straitening any body; since there is land enough in the world to suffice double the inhabitants, had not the invention of money, and the tacit agreement of men to put a value on it, introduced (by consent) larger possessions, and a right to them; which, how it has done, I shall by and by shew more at large.

§37 This is certain, that in the beginning, before the desire of having more than man needed had altered the intrinsic value of things, which depends only on their usefulness to the life of man; or had agreed, that a little piece of yellow metal, which would keep without wasting or decay, should be worth a great piece of flesh, or a whole heap of corn; though men had a right to appropriate, by their labour, each one of himself, as much of the things of nature, as he could use: yet this could not be much, nor to the prejudice of others, where the same plenty was still left to those who would use the same industry. To which let me add, that he who appropriates land to himself by his labour, does not lessen, but increase the common stock of mankind: for the provisions serving to the support of human life, produced by one acre of inclosed and cultivated land, are (to speak much within compass) ten times more than those which are yielded by an acre of land of an equal richness lying waste in common. And therefore he that incloses land, and has a greater plenty of the conveniencies of life from ten acres, than he could have from an hundred left to nature, may truly be said to give ninety acres to mankind: for his labour now supplies him with provisions out of ten acres, which were but the product of an hundred lying in common. I have here rated the improved land very low, in making its product but as ten to one, when it is much nearer an hundred to one: for I ask, whether in the wild woods and uncultivated waste of America, left to nature, without any improvement, tillage or husbandry, a thousand acres yield the needy and wretched inhabitants as many conveniencies of life, as ten acres of equally fertile land do in Devonshire, where they are well cultivated?

Before the appropriation of land, he who gathered as much of the wild fruit, killed, caught, or tamed, as many of the beasts, as he could; he that so imployed his pains about any of the spontaneous products of nature, as any way to alter them from the state which nature put them in, by placing any of his labour on them, did thereby acquire a propriety in them: but if they perished, in his possession, without

their due use; if the fruits rotted, or the venison putrified, before he could spend it, he offended against the common law of nature, and was liable to be punished; he invaded his neighbour's share, for he had no right, farther than his use called for any of them, and they might serve to afford him conveniencies of life.

§38 The same measures governed the possession of land too: whatsoever he tilled and reaped, laid up and made use of, before it spoiled, that was his peculiar right; whatsoever he enclosed, and could feed, and make use of, the cattle and product was also his. But if either the grass of his enclosure rotted on the ground, or the fruit of his planting perished without gathering, and laying up, this part of the earth, notwithstanding his enclosure, was still to be looked on as waste, and might be the possession of any other. Thus, at the beginning, Cain might take as much ground as he could till, and make it his own land, and yet leave enough to Abel's sheep to feed on; a few acres would serve for both their possessions. But as families increased, and industry inlarged their stocks, their possessions inlarged with the need of them; but yet it was commonly without any fixed property in the ground they made use of, till they incorporated, settled themselves together, and built cities; and then, by consent, they came in time, to set out the bounds of their distinct territories, and agree on limits between them and their neighbours; and by laws within themselves, settled the properties of those of the same society: for we see, that in that part of the world which was first inhabited, and therefore like to be best peopled, even as low down as Abraham's time, they wandered with their flocks, and their herds, which was their substance, freely up and down; and this Abraham did, in a country where he was a stranger. Whence it is plain, that at least a great part of the land lay in common; that the inhabitants valued it not, nor claimed property in any more than they made use of. But when there was not room enough in the same place, for their herds to feed together, they by consent, as Abraham and Lot did, Gen. xiii. 5. separated and inlarged their pasture, where it best liked them. And for the same reason Esau went from his father, and his brother, and planted in mount Seir, Gen. xxxvi. 6.

§39 And thus, without supposing any private dominion, and property in Adam, over all the world, exclusive of all other men, which can no way be proved, nor any one's property be made out from it; but supposing the world given, as it was, to the children of men in common, we see how labour could make men distinct titles to several parcels of it, for their private uses; wherein there could be no doubt of right, no room for quarrel.

§40 Nor is it so strange, as perhaps before consideration it may appear, that the property of labour should be able to over-balance the community of land: for it is labour indeed that puts the difference of value on every thing; and let any one consider what the difference is between an acre of land planted with tobacco or sugar, sown with wheat or barley, and an acre of the same land lying in common, without any husbandry upon it, and he will find, that the improvement of labour

makes the far greater part of the value. I think it will be but a very modest computation to say, that of the products of the earth useful to the life of man nine tenths are the effects of labour: nay, if we will rightly estimate things as they come to our use, and cast up the several expences about them, what in them is purely owing to nature, and what to labour, we shall find, that in most of them ninety-nine hundredths are wholly to be put on the account of labour.

§41 There cannot be a clearer demonstration of any thing, than several nations of the Americans are of this, who are rich in land, and poor in all the comforts of life; whom nature having furnished as liberally as any other people, with the materials of plenty, i.e. a fruitful soil, apt to produce in abundance, what might serve for food, raiment, and delight; yet for want of improving it by labour, have not one hundredth part of the conveniencies we enjoy: and a king of a large and fruitful territory there, feeds, lodges, and is clad worse than a day-labourer in England.

§42 To make this a little clearer, let us but trace some of the ordinary provisions of life, through their several progresses, before they come to our use, and see how much they receive of their value from human industry. Bread, wine and cloth, are things of daily use, and great plenty; yet notwithstanding, acorns, water and leaves, or skins, must be our bread, drink and cloathing, did not labour furnish us with these more useful commodities: for whatever bread is more worth than acorns, wine than water, and cloth or silk, than leaves, skins or moss, that is wholly owing to labour and industry; the one of these being the food and raiment which unassisted nature furnishes us with; the other, provisions which our industry and pains prepare for us, which how much they exceed the other in value, when any one hath computed, he will then see how much labour makes the far greatest part of the value of things we enjoy in this world: and the ground which produces the materials, is scarce to be reckoned in, as any, or at most, but a very small part of it; so little, that even amongst us, land that is left wholly to nature, that hath no improvement of pasturage, tillage, or planting, is called, as indeed it is, waste; and we shall find the benefit of it amount to little more than nothing.

This shews how much numbers of men are to be preferred to largeness of dominions; and that the increase of lands, and the right employing of them, is the great art of government: and that prince, who shall be so wise and godlike, as by established laws of liberty to secure protection and encouragement to the honest industry of mankind, against the oppression of power and narrowness of party, will quickly be too hard for his neighbours: but this by the by.

To return to the argument in hand.

§43 An acre of land, that bears here twenty bushels of wheat, and another in America, which, with the same husbandry, would do the like, are, without doubt, of the same natural intrinsic value: but yet the benefit mankind receives from the one in a year, is worth 5l. and from the other possibly not worth a penny, if all the

profit an Indian received from it were to be valued, and sold here; at least, I may truly say, not one thousandth. It is labour then which puts the greatest part of value upon land, without which it would scarcely be worth any thing: it is to that we owe the greatest part of all its useful products; for all that the straw, bran, bread, of that acre of wheat, is more worth than the product of an acre of as good land, which lies waste, is all the effect of labour: for it is not barely the plough-man's pains, the reaper's and thresher's toil, and the baker's sweat, is to be counted into the bread we eat; the labour of those who broke the oxen, who digged and wrought the iron and stones, who felled and framed the timber employed about the plough, mill, oven, or any other utensils, which are a vast number, requisite to this corn, from its being feed to be sown to its being made bread, must all be charged on the account of labour, and received as an effect of that: nature and the earth furnished only the almost worthless materials, as in themselves. It would be a strange catalogue of things, that industry provided and made use of, about every loaf of bread, before it came to our use, if we could trace them; iron, wood, leather, bark, timber, stone, bricks, coals, lime, cloth, dying drugs, pitch, tar, masts, ropes, and all the materials made use of in the ship, that brought any of the commodities made use of by any of the workmen, to any part of the work; all which it would be almost impossible, at least too long, to reckon up.

§44 From all which it is evident, that though the things of nature are given in common, yet man, by being master of himself, and proprietor of his own person, and the actions or labour of it, had still in himself the great foundation of property; and that, which made up the great part of what he applied to the support or comfort of his being, when invention and arts had improved the conveniencies of life, was perfectly his own, and did not belong in common to others.

§45 Thus labour, in the beginning, gave a right of property, wherever any one was pleased to employ it upon what was common, which remained a long while the far greater part, and is yet more than mankind makes use of. Men, at first, for the most part, contented themselves with what unassisted nature offered to their necessities: and though afterwards, in some parts of the world, (where the increase of people and stock, with the use of money, had made land scarce, and so of some value) the several communities settled the bounds of their distinct territories, and by laws within themselves regulated the properties of the private men of their society, and so, by compact and agreement, settled the property which labour and industry began; and the leagues that have been made between several states and kingdoms, either expresly or tacitly disowning all claim and right to the land in the others possession, have, by common consent, given up their pretences to their natural common right, which originally they had to those countries, and so have, by positive agreement, settled a property amongst themselves, in distinct parts and parcels of the earth; yet there are still great tracts of ground to be found, which (the inhabitants thereof not having joined with the rest of mankind, in the consent of the

use of their common money) lie waste, and are more than the people who dwell on it do, or can make use of, and so still lie in common; tho' this can scarce happen amongst that part of mankind that have consented to the use of money.

§46 The greatest part of things really useful to the life of man, and such as the necessity of subsisting made the first commoners of the world look after, as it doth the Americans now, are generally things of short duration; such as, if they are not consumed by use, will decay and perish of themselves: gold, silver and diamonds, are things that fancy or agreement hath put the value on, more than real use, and the necessary support of life. Now of those good things which nature hath provided in common, every one had a right (as hath been said) to as much as he could use, and property in all that he could effect with his labour; all that his industry could extend to, to alter from the state nature had put it in, was his. He that gathered a hundred bushels of acorns or apples, had thereby a property in them, they were his goods as soon as gathered. He was only to look, that he used them before they spoiled, else he took more than his share, and robbed others. And indeed it was a foolish thing, as well as dishonest, to hoard up more than he could make use of. If he gave away a part to any body else, so that it perished not uselesly in his possession, these he also made use of. And if he also bartered away plums, that would have rotted in a week, for nuts that would last good for his eating a whole year, he did no injury; he wasted not the common stock; destroyed no part of the portion of goods that belonged to others, so long as nothing perished uselesly in his hands. Again, if he would give his nuts for a piece of metal, pleased with its colour; or exchange his sheep for shells, or wool for a sparkling pebble or a diamond, and keep those by him all his life he invaded not the right of others, he might heap up as much of these durable things as he pleased; the exceeding of the bounds of his just property not lying in the largeness of his possession, but the perishing of any thing uselesly in it.

§47 And thus came in the use of money, some lasting thing that men might keep without spoiling, and that by mutual consent men would take in exchange for the truly useful, but perishable supports of life.

§48 And as different degrees of industry were apt to give men possessions in different proportions, so this invention of money gave them the opportunity to continue and enlarge them: for supposing an island, separate from all possible commerce with the rest of the world, wherein there were but an hundred families, but there were sheep, horses and cows, with other useful animals, wholsome fruits, and land enough for corn for a hundred thousand times as many, but nothing in the island, either because of its commonness, or perishableness, fit to supply the place of money; what reason could any one have there to enlarge his possessions beyond the use of his family, and a plentiful supply to its consumption, either in what their own industry produced, or they could barter for like perishable, useful commodities, with others? Where there is not some thing, both lasting and scarce,

and so valuable to be hoarded up, there men will not be apt to enlarge their possessions of land, were it never so rich, never so free for them to take: for I ask, what would a man value ten thousand, or an hundred thousand acres of excellent land, ready cultivated, and well stocked too with cattle, in the middle of the inland parts of America, where he had no hopes of commerce with other parts of the world, to draw money to him by the sale of the product? It would not be worth the enclosing, and we should see him give up again to the wild common of nature, whatever was more than would supply the conveniencies of life to be had there for him and his family.

§49 Thus in the beginning all the world was America, and more so than that is now; for no such thing as money was any where known. Find out something that hath the use and value of money amongst his neighbours, you shall see the same man will begin presently to enlarge his possessions.

§50 But since gold and silver, being little useful to the life of man in proportion to food, raiment, and carriage, has its value only from the consent of men, whereof labour yet makes, in great part, the measure, it is plain, that men have agreed to a disproportionate and unequal possession of the earth, they having, by a tacit and voluntary consent, found out, a way how a man may fairly possess more land than he himself can use the product of, by receiving in exchange for the overplus gold and silver, which may be hoarded up without injury to any one; these metals not spoiling or decaying in the hands of the possessor. This partage of things in an inequality of private possessions, men have made practicable out of the bounds of society, and without compact, only by putting a value on gold and silver, and tacitly agreeing in the use of money: for in governments, the laws regulate the right of property, and the possession of land is determined by positive constitutions.

§51 And thus, I think, it is very easy to conceive, without any difficulty, how labour could at first begin a title of property in the common things of nature, and how the spending it upon our uses bounded it. So that there could then be no reason of quarrelling about title, nor any doubt about the largeness of possession it gave. Right and conveniency went together; for as a man had a right to all he could employ his labour upon, so he had no temptation to labour for more than he could make use of. This left no room for controversy about the title, nor for encroachment on the right of others; what portion a man carved to himself, was easily seen; and it was useless, as well as dishonest, to carve himself too much, or take more than he needed.

Charles Darwin, *Descent of Man*

CHAPTER V. – ON THE DEVELOPMENT OF THE INTELLECTUAL AND MORAL FACULTIES DURING PRIMEVAL AND CIVILISED TIMES.

The advancement of the intellectual powers through natural selection – Importance of imitation – Social and moral faculties – Their development within the limits of the same tribe – Natural selection as affecting civilised nations – Evidence that civilised nations were once barbarous.

THE subjects to be discussed in this chapter are of the highest interest, but are treated by me in a most imperfect and fragmentary manner. Mr. Wallace, in an admirable paper before referred to,[26] argues that man after he had partially acquired those intellectual and moral faculties which distinguish him from the lower animals, would have been but little liable to have had his bodily structure modified through natural selection or any other means. For man is enabled through his mental faculties "to keep with an unchanged body in harmony with the changing universe." He has great power of adapting his habits to new conditions of life. He invents weapons, tools and various stratagems, by which he procures food and defends himself. When he migrates into a colder climate he uses clothes, builds sheds, and makes fires; and, by the aid of fire, cooks food otherwise indigestible. He aids his fellow-men in many ways, and anticipates future events. Even at a remote period he practised some subdivision of labour.

The lower animals, on the other hand, must have their bodily structure modified in order to survive under greatly changed conditions. They must be rendered stronger, or acquire more effective teeth or claws, in order to defend themselves from new enemies; or they must be reduced in size so as to escape detection and danger. When they migrate into a colder climate they must become clothed with thicker fur, or have their constitutions altered. If they fail to be thus modified, they will cease to exist.

The case, however, is widely different, as Mr. Wallace has with justice insisted, in relation to the intellectual and moral faculties of man. These faculties are variable; and we have every reason to believe that the variations tend to be inherited. Therefore, if they were formerly of high importance to primeval man and to his ape-like progenitors, they would have been perfected or advanced through natural selection. Of the high importance of the intellectual faculties there can be no doubt, for man mainly owes to them his preeminent position in the world. We can see that, in the rudest state of society, the individuals who were the most sagacious, who invented and used the best weapons or traps, and who were best able to defend themselves, would rear the greatest number of offspring. The tribes which included the largest number of men thus endowed would increase in number and supplant other tribes. Numbers depend primarily on the means of subsistence, and this, partly on the physical nature of the country, but in a much higher degree on the arts which are there practised. As a tribe increases and is victorious,

[26] 'Anthropological Review,' May, 1864, p. clviii.

it is often still further increased by the absorption of other tribes.[27] The stature and strength of the men of a tribe are likewise of some importance for its success, and these depend in part on the nature and amount of the food which can be obtained. In Europe the men of the Bronze period were supplanted by a more powerful and, judging from their sword-handles, larger-handed race;[28] but their success was probably due in a much higher degree to their superiority in the arts.

All that we know about savages, or may infer from their traditions and from old monuments, the history of which is quite forgotten by the present inhabitants, shew that from the remotest times successful tribes have supplanted other tribes. Relics of extinct or forgotten tribes have been discovered throughout the civilised regions of the earth, on the wild plains of America, and on the isolated islands in the Pacific Ocean. At the present day civilised nations are everywhere supplanting barbarous nations, excepting where the climate opposes a deadly barrier; and they succeed mainly, though not exclusively, through their arts, which are the products of the intellect. It is, therefore, highly probable that with mankind the intellectual faculties have been gradually perfected through natural selection; and this conclusion is sufficient for our purpose. Undoubtedly it would have been very interesting to have traced the development of each separate faculty from the state in which it exists in the lower animals to that in which it exists in man; but neither my ability nor knowledge permit the attempt.

It deserves notice that as soon as the progenitors of man became social (and this probably occurred at a very early period), the advancement of the intellectual faculties will have been aided and modified in an important manner, of which we see only traces in the lower animals, namely, through the principle of imitation, together with reason and experience. Apes are much given to imitation, as are the lowest savages; and the simple fact previously referred to, that after a time no animal can be caught in the same place by the same sort of trap, shews that animals learn by experience, and imitate each others' caution. Now, if some one man in a tribe, more sagacious than the others, invented a new snare or weapon, or other means of attack or defence, the plainest self-interest, without the assistance of much reasoning power, would prompt the other members to imitate him; and all would thus profit. The habitual practice of each new art must likewise in some slight degree strengthen the intellect. If the new invention were an important one, the tribe would increase in number, spread, and supplant other tribes. In a tribe thus rendered more numerous there would always be a rather better chance of the birth of other superior and inventive members. If such men left children to inherit their mental superiority, the chance of the birth of still more ingenious members would be somewhat better, and in a very small tribe decidedly better. Even if they left no children, the tribe would still include their blood-relations; and it has been ascertained

[27] After a time the members or tribes which are absorbed into another tribe assume, as Mr. Maine remarks ('Ancient Law,' 1861, p. 131), that they are the co-descendants of the same ancestors.
[28] Morlot, 'Soc. Vaud. Sc. Nat.' 1860, p. 294.

by agriculturists[29] that by preserving and breeding from the family of an animal, which when slaughtered was found to be valuable, the desired character has been obtained.

Turning now to the social and moral faculties. In order that primeval men, or the ape-like progenitors of man, should have become social, they must have acquired the same instinctive feelings which impel other animals to live in a body; and they no doubt exhibited the same general disposition. They would have felt uneasy when separated from their comrades, for whom they would have felt some degree of love; they would have warned each other of danger, and have given mutual aid in attack or defence. All this implies some degree of sympathy, fidelity, and courage. Such social qualities, the paramount importance of which to the lower animals is disputed by no one, were no doubt acquired by the progenitors of man in a similar manner, namely, through natural selection, aided by inherited habit. When two tribes of primeval man, living in the same country, came into competition, if the one tribe included (other circumstances being equal) a greater number of courageous, sympathetic, and faithful members, who were always ready to warn each other of danger, to aid and defend each other, this tribe would without doubt succeed best and conquer the other. Let it be borne in mind how all-important, in the never-ceasing wars of savages, fidelity and courage must be. The advantage which disciplined soldiers have over undisciplined hordes follows chiefly from the confidence which each man feels in his comrades. Obedience, as Mr. Bagehot has well shewn,[30] is of the highest value, for any form of government is better than none. Selfish and contentious people will not cohere, and without coherence nothing can be effected. A tribe possessing the above qualities in a high degree would spread and be victorious over other tribes; but in the course of time it would, judging from all past history, be in its turn overcome by some other and still more highly endowed tribe. Thus the social and moral qualities would tend slowly to advance and be diffused throughout the world.

But it may be asked, how within the limits of the same tribe did a large number of members first become endowed with these social and moral qualities, and how was the standard of excellence raised? It is extremely doubtful whether the offspring of the more sympathetic and benevolent parents, or of those which were the most faithful to their comrades, would be reared in greater number than the children of selfish and treacherous parents of the same tribe. He who was ready to sacrifice his life, as many a savage has been, rather than betray his comrades, would often leave no offspring to inherit his noble nature. The bravest men, who were always willing to come to the front in war, and who freely risked their lives for others, would on an average perish in larger number than other men. Therefore it seems scarcely possible (bearing in mind that we are not here speaking of one tribe being victorious over another) that the number of men gifted with such virtues, or that the standard of their excellence, could be increased through natural selection, that is, by the survival of the fittest.

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[29] I have given instances in my 'Variation of Animals under Domestication,' vol. ii. p. 196.

[30] See a remarkable series of articles on Physics and Politics in the 'Fortnightly Review,' Nov. 1867; April 1, 1868; July 1, 1869.

Although the circumstances which lead to an increase in the number of men thus endowed within the same tribe are too complex to be clearly followed out, we can trace some of the probable steps. In the first place, as the reasoning powers and foresight of the members became improved, each man would soon learn from experience that if he aided his fellow-men, he would commonly receive aid in return. From this low motive he might acquire the habit of aiding his fellows; and the habit of performing benevolent actions certainly strengthens the feeling of sympathy, which gives the first impulse to benevolent actions. Habits, moreover, followed during many generations probably tend to be inherited.

But there is another and much more powerful stimulus to the development of the social virtues, namely, the praise and the blame of our fellow-men. The love of approbation and the dread of infamy, as well as the bestowal of praise or blame, are primarily due, as we have seen in the third chapter, to the instinct of sympathy; and this instinct no doubt was originally acquired, like all the other social instincts, through natural selection. At how early a period the progenitors of man, in the course of their development, became capable of feeling and being impelled by the praise or blame of their fellow-creatures, we cannot, of course, say. But it appears that even dogs appreciate encouragement, praise, and blame. The rudest savages feel the sentiment of glory, as they clearly show by preserving the trophies of their prowess, by their habit of excessive boasting, and even by the extreme care which they take of their personal appearance and decorations; for unless they regarded the opinion of their comrades, such habits would be senseless.

They certainly feel shame at the breach of some of their lesser rules; but how far they experience remorse is doubtful. I was at first surprised that I could not recollect any recorded instances of this feeling in savages; and Sir J. Lubbock[31] states that he knows of none. But if we banish from our minds all cases given in novels and plays and in death-bed confessions made to priests, I doubt whether many of us have actually witnessed remorse; though we may have often seen shame and contrition for smaller offences. Remorse is a deeply hidden feeling. It is incredible that a savage, who will sacrifice his life rather than betray his tribe, or one who will deliver himself up as a prisoner rather than break his parole,[32] would not feel remorse in his inmost soul, though he might conceal it, if he had failed in a duty which he held sacred.

We may therefore conclude that primeval man, at a very remote period, would have been influenced by the praise and blame of his fellows. It is obvious, that the members of the same tribe would approve of conduct which appeared to them to be for the general good, and would reprobate that which appeared evil. To do good unto others—to do unto others as ye would they should do unto you,—is the foundation-stone of morality. It is, therefore, hardly possible to exaggerate the importance during rude times of the love of praise and the dread of blame. A man who

[31] 'Origin of Civilisation,' 1870, p. 265

[32] Mr. Wallace gives cases in his 'Contributions to the Theory of Natural Selection,' 1870, p. 354.

was not impelled by any deep, instinctive feeling, to sacrifice his life for the good of others, yet was roused to such actions by a sense of glory, would by his example excite the same wish for glory in other men, and would strengthen by exercise the noble feeling of admiration. He might thus do far more good to his tribe than by begetting offspring with a tendency to inherit his own high character.

With increased experience and reason, man perceives the more remote consequences of his actions, and the self-regarding virtues, such as temperance, chastity, &c., which during early times are, as we have before seen, utterly disregarded, come to be highly esteemed or even held sacred. I need not, however, repeat what I have said on this head in the third chapter. Ultimately a highly complex sentiment, having its first origin in the social instincts, largely guided by the approbation of our fellow-men, ruled by reason, self-interest, and in later times by deep religious feelings, confirmed by instruction and habit, all combined, constitute our moral sense or conscience.

It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe, yet that an advancement in the standard of morality and an increase in the number of well-endowed men will certainly give an immense advantage to one tribe over another. There can be no doubt that a tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to give aid to each other and to sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection. At all times throughout the world tribes have supplanted other tribes; and as morality is one element in their success, the standard of morality and the number of well-endowed men will thus everywhere tend to rise and increase.

It is, however, very difficult to form any judgment why one particular tribe and not another has been successful and has risen in the scale of civilisation. Many savages are in the same condition as when first discovered several centuries ago. As Mr. Bagehot has remarked, we are apt to look at progress as the normal rule in human society; but history refutes this. The ancients did not even entertain the idea; nor do the oriental nations at the present day. According to another high authority, Mr. Maine,[33] "the greatest part of mankind has never shewn a particle of desire that its civil institutions should be improved." Progress seems to depend on many concurrent favourable conditions, far too complex to be followed out. But it has often been remarked, that a cool climate from leading to industry and the various arts has been highly favourable, or even indispensable for this end. The Esquimaux, pressed by hard necessity, have succeeded in many ingenious inventions, but their climate has been too severe for continued progress. Nomadic habits, whether over wide plains, or through the dense forests of the tropics, or along the shores of the sea, have in every case been highly detrimental. Whilst observing the barbarous inhabitants of Tierra del Fuego, it struck me that the possession of some property, a fixed abode, and the union of many families

[33] 'Ancient Law,' 1861, p. 22. For Mr. Bagehot's remarks, ' Fortnightly Review,' April 1, 1868, p. 452.

under a chief, were the indispensable requisites for civilisation. Such habits almost necessitate the cultivation of the ground; and the first steps in cultivation would probably result, as I have elsewhere shewn,[34] from some such accident as the seeds of a fruit-tree falling on a heap of refuse and producing an unusually fine variety. The problem, however, of the first advance of savages towards civilisation is at present much too difficult to be solved.

Natural Selection as affecting Civilised Nations.—In the last and present chapters I have considered the advancement of man from a former semi-human condition to his present state as a barbarian. But some remarks on the agency of natural selection on civilised nations may be here worth adding. This subject has been ably discussed by Mr. W. R. Greg,[35] and previously by Mr. Wallace and Mr. Galton.[36] Most of my remarks are taken from these three authors. With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilised men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of every one to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to small-pox. Thus the weak members of civilised societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. It is surprising how soon a want of care, or care wrongly directed, leads to the degeneration of a domestic race; but excepting in the case of man himself, hardly any one is so ignorant as to allow his worst animals to breed.

The aid which we feel impelled to give to the helpless is mainly an incidental result of the instinct of sympathy, which was originally acquired as part of the social instincts, but subsequently rendered, in the manner previously indicated, more tender and more widely diffused. Nor could we check our sympathy, if so urged by hard reason, without deterioration in the noblest part of our nature. The surgeon may harden himself whilst performing an operation, for he knows that he is acting for the good of his patient; but if we were intentionally to neglect the weak and helpless, it could only be for a contingent benefit, with a certain and great present evil. Hence we must bear without complaining the undoubtedly bad effects of the weak surviving and propagating their kind; but there appears to be at least one check in steady action, namely the weaker and inferior members of society not marrying so freely as the sound; and this check might be

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[34] 'The Variation of Animals and Plants under Domestication,' vol. i. p. 309.

[35] 'Fraser's Magazine,' Sept. 1868, p. 353. This article seems to have struck many persons, and has given rise to two remarkable essays and a rejoinder in the ' Spectator,' Oct. 3rd and 17th 1868. It has also been discussed in the ' Q. Journal of Science,' 1869, p. 152, and by Mr. Lawson Tait in the ' Dublin Q. Journal of Medical Science,' Feb. 1869, and by Mr. E. Ray Lankester in his ' Comparative Longevity,' 1870, p. 128. Similar views appeared previously in the 'Australasian,' July 13, 1867. I have borrowed ideas from several of these writers.

[36] For Mr. Wallace, see 'Anthropology Review,' as before cited. Mr. Galton in ' Macmillan's Magazine,' Aug. 1865, p. 318; also his great work, ' Hereditary Genius,' 1870.

indefinitely increased, though this is more to be hoped for than expected, by the weak in body or mind refraining from marriage.

In all civilised countries man accumulates property and bequeaths it to his children. So that the children in the same country do not by any means start fair in the race for success. But this is far from an unmixed evil; for without the accumulation of capital the arts could not progress; and it is chiefly through their power that the civilised races have extended, and are now everywhere extending, their range, so as to take the place of the lower races. Nor does the moderate accumulation of wealth interfere with the process of selection. When a poor man becomes rich, his children enter trades or professions in which there is struggle enough, so that the able in body and mind succeed best. The presence of a body of well-instructed men, who have not to labour for their daily bread, is important to a degree which cannot be over-estimated; as all high intellectual work is carried on by them, and on such work material progress of all kinds mainly depends, not to mention other and higher advantages. No doubt wealth when very great tends to convert men into useless drones, but their number is never large; and some degree of elimination here occurs, as we daily see rich men, who happen to be fools or profligate, squandering away all their wealth.

Primogeniture with entailed estates is a more direct evil, though it may formerly have been a great advantage by the creation of a dominant class, and any government is better than anarchy. The eldest sons, though they may be weak in body or mind, generally marry, whilst the younger sons, however superior in these respects, do not so generally marry. Nor can worthless eldest sons with entailed estates squander their wealth. But here, as elsewhere, the relations of civilised life are so complex that some compensatory checks intervene. The men who are rich through primogeniture are able to select generation after generation the more beautiful and charming women; and these must generally be healthy in body and active in mind. The evil consequences, such as they may be, of the continued preservation of the same line of descent, without any selection, are checked by men of rank always wishing to increase their wealth and power; and this they effect by marrying heiresses. But the daughters of parents who have produced single children, are themselves, as Mr. Galton has shewn,[37] apt to be sterile; and thus noble families are continually cut off in the direct line, and their wealth flows into some side channel; but unfortunately this channel is not determined by superiority of any kind.

Although civilisation thus checks in many ways the action of natural selection, it apparently favours, by means of improved food and the freedom from occasional hardships, the better development of the body. This may be inferred from civilised men having been found, wherever compared, to be physically stronger than savages. They appear also to have equal powers of endurance, as has been proved in many adventurous expeditions. Even the great luxury of the rich can be but little detrimental;

[37] 'Hereditary Genius,' 1870, p. 132-140.

for the expectation of life of our aristocracy, at all ages and of both sexes, is very little inferior to that of healthy English lives in the lower classes.[38]

We will now look to the intellectual faculties alone. If in each grade of society the members were divided into two equal bodies, the one including the intellectually superior and the other the inferior, there can be little doubt that the former would succeed best in all occupations and rear a greater number of children. Even in the lowest walks of life, skill and ability must be of some advantage, though in many occupations, owing to the great division of labour, a very small one. Hence in civilised nations there will be some tendency to an increase both in the number and in the standard of the intellectually able. But I do not wish to assert that this tendency may not be more than counterbalanced in other ways, as by the multiplication of the reckless and improvident; but even to such as these, ability must be some advantage.

It has often been objected to views like the foregoing, that the most eminent men who have ever lived have left no offspring to inherit their great intellect. Mr. Galton says,[39] " I regret I am unable to solve the simple question whether, and how far, men and women who are prodigies of genius are infertile. I have, however, shewn that men of eminence are by no means so." Great lawgivers, the founders of beneficent religions, great philosophers and discoverers in science, aid the progress of mankind in a far higher degree by their works than by leaving a numerous progeny. In the case of corporeal structures, it is the selection of the slightly better-endowed and the elimination of the slightly less well-endowed individuals, and not the preservation of strongly-marked and rare anomalies, that leads to the advancement of a species.[40] So it will be with the intellectual faculties, namely from the somewhat more able men in each grade of society succeeding rather better than the less able, and consequently increasing in number, if not otherwise prevented. When in any nation the standard of intellect and the number of intellectual men have increased, we may expect from the law of the deviation from an average, as shewn by Mr. Galton, that prodigies of genius will appear somewhat more frequently than before.

In regard to the moral qualities, some elimination of the worst dispositions is always in progress even in the most civilised nations. Malefactors are executed, or imprisoned for long periods, so that they cannot freely transmit their bad qualities. Melancholic and insane persons are confined, or commit suicide. Violent and quarrelsome men often come to a bloody end. Restless men who will not follow any steady occupation—and this relic of barbarism is a great check to civilisation[41]—emigrate to newly-settled countries, where they prove useful pioneers. Intemperance is so highly destructive, that the expectation of life of the intemperate, at the age, for instance, of thirty, is only 13.8 years; whilst for the rural labourers of England at the same age it is

[38] See the fifth and sixth columns, compiled from good authorities, in the table given in Mr. E. R. Lankester's 'Comparative Longevity,' 1870, p. 115.
[39] 'Hereditary Genius,' 1870, p. 330.
[40] 'Origin of Species' (fifth edition, 1869), p. 104.
[41] 'Hereditary Genius,' 1870, p. 347.

40.59 years.[42] Profligate women bear few children, and profligate men rarely marry; both suffer from disease. In the breeding of domestic animals, the elimination of those individuals, though few in number, which are in any marked manner inferior, is by no means an unimportant element towards success. This especially holds good with injurious characters which tend to reappear through reversion, such as blackness in sheep; and with mankind some of the worst dispositions, which occasionally without any assignable cause make their appearance in families, may perhaps be reversions to a savage state, from which we are not removed by very many generations. This view seems indeed recognised in the common expression that such men are the black sheep of the family.

With civilised nations, as far as an advanced standard of morality, and an increased number of fairly well-endowed men are concerned, natural selection apparently effects but little; though the fundamental social instincts were originally thus gained. But I have already said enough, whilst treating of the lower races, on the causes which lead to the advance of morality, namely, the approbation of our fellow-men—the strengthening of our sympathies by habit—example and imitation—reason—experience and even self-interest—instruction during youth, and religious feelings.

A most important obstacle in civilised countries to an increase in the number of men of a superior class has been strongly urged by Mr. Greg and Mr. Galton,[43] namely, the fact that the very poor and reckless, who are often degraded by vice, almost invariably marry early, whilst the careful and frugal, who are generally otherwise virtuous, marry late in life, so that they may be able to support themselves and their children in comfort. Those who marry early produce within a given period not only a greater number of generations, but, as shewn by Dr. Duncan,[44] they produce many more children. The children, moreover, that are born by mothers during the prime of life are heavier and larger, and therefore probably more vigorous, than those born at other periods. Thus the reckless, degraded, and often vicious members of society, tend to increase at a quicker rate than the provident and generally virtuous members. Or as Mr. Greg puts the case: "The careless, squalid, unaspiring Irishman multiplies like rabbits: the frugal, foreseeing, self-respecting, ambitious Scot, stem in his morality, spiritual in his faith, sagacious and disciplined in his intelligence, passes his best years in struggle and in celibacy, marries late, and leaves few behind him. Given a land originally peopled by a thousand Saxons and a thousand Celts—and in a dozen generations five-sixths of the population would be Celts, but five-sixths of the property, of the power, of the intellect, would belong to the one-sixth of Saxons that remained. In the eternal ' struggle

[42] E. Ray Lankester, 'Comparative Longevity,' 1870, p. 115. The table of the intemperate is from Neison's ' Vital Statistics.' In regard to profligacy, see Dr. Farr, " Influence of Marriage on Mortality," ' Nat. Assoc. for the Promotion of Social Science,' 1858.

[43] 'Fraser's Magazine,' Sept. 1868, p. 353. 'Macmillan's Magazine,' Aug. 1865, p. 318. The Rev. F. W. Farrar ('Fraser's Mag.,' Aug. 1870, p. 264) takes a different view.

[44] "On the Laws of the Fertility of Women," in ' Transact. Royal Soc.' Edinburgh, vol. xxiv. p. 287. See, also, Mr. Galton, 'Hereditary Genius,' p. 352-857, for observations to the above effect.

for existence,' it would be the inferior and less favoured race that had prevailed—and prevailed by virtue not of its good qualities but of its faults."

There are, however, some checks to this downward tendency. We have seen that the intemperate suffer from a high rate of mortality, and the extremely profligate leave few offspring. The poorest classes crowd into towns, and it has been proved by Dr. Stark from the statistics of ten years in Scotland,[45] that at all ages the death-rate is higher in towns than in rural districts, "and during the first five years of life the town death rate is almost exactly double that of the rural districts." As these returns include both the rich and the poor, no doubt more than double the number of births would be requisite to keep up the number of the very poor inhabitants in the towns, relatively to those in the country. With women, marriage at too early an age is highly injurious; for it has been found in France that, "twice as many wives under twenty die in the year, as died out of the same number of the unmarried." The mortality, also, of husbands under twenty is "excessively high,"[46] but what the cause of this may be seems doubtful. Lastly, if the men who prudently delay marrying until they can bring up their families in comfort, were to select, as they often do, women in the prime of life, the rate of increase in the better class would be only slightly lessened.

It was established from an enormous body of statistics, taken during 1853, that the unmarried men throughout France, between the ages of twenty and eighty, die in a much larger proportion than the married: for instance, out of every 1000 unmarried men, between the ages of twenty and thirty, 11.3 annually died, whilst of the married only 6.5 died.[47] A similar law was proved to hold good, during the years 1863 and 1864, with the entire population above the age of twenty in Scotland: for instance, out of every 1000 unmarried men, between the ages of twenty and thirty, 14.97 annually died, whilst of the married only 7.24 died, that is less than half.[48] Dr. Stark remarks on this, " Bachelorhood is "more destructive to life than the most unwholesome trades, or than residence in an unwholesome house or district where there has never been the most distant attempt at sanitary improvement." He considers that the lessened mortality is the direct result of "marriage, and the more regular domestic habits which attend that state." He admits, however, that the intemperate, profligate, and criminal classes, whose duration of life is low, do not commonly marry; and it must likewise be admitted that men with a weak constitution, ill health, or any great infirmity in body or mind, will often not wish to marry, or will be rejected. Dr. Stark seems to have come to the conclusion that marriage in itself is a main cause of prolonged life, from finding that aged married men still have a considerable advantage in this respect over the unmarried of the same advanced age;

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[45] 'Tenth Annual Report of Births, Deaths, &c., in Scotland,' 1867, p. xxix.

[46] These quotations are taken from our highest authority on such questions, namely, Dr. Farr, in his paper "On the Influence of Marriage on the Mortality of the French People," read before the Nat. Assoc. for the Promotion of Social Science, 1858.

[47] Dr. Farr, ibid. The quotations given below are extracted from the same striking paper.

[48] I have taken the mean of the quinquennial means, given in 'The Tenth Annual Report of Births, Deaths, &c., in Scotland,' 1867. The quotation from Dr. Stark is copied from an article in the ' Daily News,' Oct. 17th, 1868, which Dr. Farr considers very carefully written.

but every one must have known instances of men, who with weak health during youth did not marry, and yet have survived to old age, though remaining weak and therefore always with a lessened chance of life. There is another remarkable circumstance which seems to support Dr. Stark's conclusion,—namely, that widows and widowers in France suffer in comparison with the married a very heavy rate of mortality; but Dr. Farr attributes this to the poverty and evil habits consequent on the disruption of the family, and to grief. On the whole we may conclude with Dr. Farr that the lesser mortality of married than of unmarried men, which seems to be a general law, "is mainly due to the constant elimination of imperfect types, and to the skilful selection of the finest individuals out of each successive generation;" the selection relating only to the marriage state, and acting on all corporeal, intellectual, and moral qualities. We may, therefore, infer that sound and good men who out of prudence remain for a time unmarried do not suffer a high rate of mortality.

If the various checks specified in the two last paragraphs, and perhaps others as yet unknown, do not prevent the reckless, the vicious and otherwise inferior members of society from increasing at a quicker rate than the better class of men, the nation will retrograde, as has occurred too often in the history of the world. We must remember that progress is no invariable rule. It is most difficult to say why one civilised nation rises, becomes more powerful, and spreads more widely, than another; or why the same nation progresses more at one time than at another. We can only say that it depends on an increase in the actual number of the population, on the number of the men endowed with high intellectual and moral faculties, as well as on their standard of excellence. Corporeal structure, except so far as vigour of body leads to vigour of mind, appears to have little influence.

It has been urged by several writers that as high intellectual powers are advantageous to a nation, the old Greeks, who stood some grades higher in intellect than any race that has ever existed,[49] ought to have risen, if the power of natural selection were real, still higher in the scale, increased in number, and stocked the whole of Europe. Here we have the tacit assumption, so often made with respect to corporeal structures, that there is some innate tendency towards continued development in mind and body. But development of all kinds depends on many concurrent favourable circumstances. Natural selection acts only in a tentative manner. Individuals and races may have acquired certain indisputable advantages, and yet have perished from failing in other characters. The Greeks may have retrograded from a want of coherence between the many small states, from the small size of their whole country, from the practice of slavery, or from extreme sensuality; for they did not succumb until "they were enervated and corrupt to the very core."[50] The western nations of Europe, who now so immeasurably surpass their former savage progenitors and stand at the summit of

[49] See the ingenious and original argument on this subject by Mr. Galton, 'Hereditary Genius,' p. 340-342.
[50] Mr. Greg, 'Fraser's Magazine,' Sept. 1868, p. 357.

civilisation, owe little or none of their superiority to direct inheritance from the old Greeks; though they owe much to the written works of this wonderful people.

Who can positively say why the Spanish nation, so dominant at one time, has been distanced in the race. The awakening of the nations of Europe from the dark ages is a still more perplexing problem. At this early period, as Mr. Galton[51] has remarked, almost all the men of a gentle nature, those given to meditation or culture of the mind, had no refuge except in the bosom of the Church which demanded celibacy; and this could hardly fail to have had a deteriorating influence on each successive generation. During this same period the Holy Inquisition selected with extreme care the freest and boldest men in order to burn or imprison them. In Spain alone some of the best men—those who doubted and questioned, and without doubting there can be no progress—were eliminated during three centuries at the rate of a thousand a year. The evil which the Catholic Church has thus effected, though no doubt counterbalanced to a certain, perhaps large extent in other ways, is incalculable; nevertheless, Europe has progressed at an unparalleled rate.

The remarkable success of the English as colonists over other European nations, which is well illustrated by comparing the progress of the Canadians of English and French extraction, has been ascribed to their "daring and persistent energy;" but who can say how the English gained their energy. There is apparently much truth in the belief that the wonderful progress of the United States, as well as the character of the people, are the results of natural selection; the more energetic, restless, and courageous men from all parts of Europe having emigrated during the last ten or twelve generations to that great country, and having there succeeded best.[52] Looking to the distant future, I do not think that the Rev. Mr. Zincke takes an exaggerated view when he says:[53] "All other series of events—as that which resulted in the culture of mind in Greece, and that which resulted in the empire of Rome—only appear to have purpose and value when viewed in connection with, or rather as subsidiary to… the great stream of Anglo-Saxon emigration to the west." Obscure as is the problem of the advance of civilisation, we can at least see that a nation which produced during a lengthened period the greatest number of highly intellectual, energetic, brave, patriotic, and benevolent men, would generally prevail over less favoured nations.

Natural selection follows from the struggle for existence; and this from a rapid rate of increase. It is impossible not bitterly to regret, but whether wisely is another question, the rate at which man tends to increase; for this leads in barbarous tribes to infanticide and many other evils, and in civilised nations to abject poverty, celibacy, and

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[51] 'Hereditary Genius,' 1870, p. 357-359. The Rev. F. H. Farrar ('Fraser's Mag.', Aug. 1870, p. 257) advances arguments on the other side. Sir C. Lyell had already ('Principles of Geology,' vol. ii. 1868, p. 489) called attention, in a striking passage, to the evil influence of the Holy Inquisition in having lowered, through selection, the general standard of intelligence in Europe.

[52] Mr. Galton, 'Macmillan's Magazine,' August, 1865, p. 325. See, also, 'Nature,' "On Darwinism and National Life," Dec. 1869, p. 184.

[53] 'Last Winter in the United States,' 1868, p. 29.

to the late marriages of the prudent. But as man suffers from the same physical evils with the lower animals, he has no right to expect an immunity from the evils consequent on the struggle for existence. Had he not been subjected to natural selection, assuredly he would never have attained to the rank of manhood. When we see in many parts of the world enormous areas of the most fertile land peopled by a few wandering savages, but which are capable of supporting numerous happy homes, it might be argued that the struggle for existence had not been sufficiently severe to force man upwards to his highest standard. Judging from all that we know of man and the lower animals, there has always been sufficient variability in the intellectual and moral faculties, for their steady advancement through natural selection. No doubt such advancement demands many favourable concurrent circumstances; but it may well be doubted whether the most favourable would have sufficed, had not the rate of increase been rapid, and the consequent struggle for existence severe to an extreme degree.

On the evidence that all civilised nations were once barbarous.—As we have had to consider the steps by which some semi-human creature has been gradually raised to the rank of man in his most perfect state, the present subject cannot be quite passed over. But it has been treated in so full and admirable a manner by Sir J. Lubbock,[54] Mr. Tylor, Mr. M'Lennan, and others, that I need here give only the briefest summary of their results. The arguments recently advanced by the Duke of Argyll[55] and formerly by Archbishop Whately, in favour of the belief that man came into the world as a civilised being and that all savages have since undergone degradation, seem to me weak in comparison with those advanced on the other side. Many nations, no doubt, have fallen away in civilisation, and some may have lapsed into utter barbarism, though on this latter head I have not met with any evidence. The Fuegians were probably compelled by other conquering hordes to settle in their inhospitable country, and they may have become in consequence somewhat more degraded; but it would be difficult to prove that they have fallen much below the Botocudos who inhabit the finest parts of Brazil.

The evidence that all civilised nations are the descendants of barbarians, consists, on the one side, of clear traces of their former low condition in still-existing customs, beliefs, language, &c.; and on the other side, of proofs that savages are independently able to raise themselves a few steps in the scale of civilisation, and have actually thus risen. The evidence on the first head is extremely curious, but cannot be here given: I refer to such cases as that, for instance, of the art of enumeration, which, as Mr. Tylor clearly shews by the words still used in some places, originated in counting the fingers, first of one hand and then of the other, and lastly of the toes. We have traces of this in our own decimal system, and in the Roman numerals, which after reaching to the number V., change into VI., &c., when the other hand no doubt was used. So again, "when we speak of three-score and ten, we are counting by the vigesimal system, each score thus ideally made, standing for 20—for 'one man' as a Mexican or Carib would put

[54] 'On the Origin of Civilisation,' 'Proc. Ethnological Soc.' Nov. 26, 1867.
[55] 'Primeval Man,' 1869.

it."[56] According to a large and increasing school of philologists, every language bears the marks of its slow and gradual evolution. So it is with the art of writing, as letters are rudiments of pictorial representations. It is hardly possible to read Mr. McLennan's work[57] and not admit that almost all civilised nations still retain some traces of such rude habits as the forcible capture of wives. What ancient nation, as the same author asks, can be named that was originally monogamous? The primitive idea of justice, as shewn by the law of battle and other customs of which traces still remain, was likewise most rude. Many existing superstitions are the remnants of former false religious beliefs. The highest form of religion—the grand idea of God hating sin and loving righteousness—was unknown during primeval times.

Turning to the other kind of evidence: Sir J. Lubbock has shewn that some savages have recently improved a little in some of their simpler arts. From the extremely curious account which he gives of the weapons, tools, and arts, used or practised by savages in various parts of the world, it cannot be doubted that these have nearly all been independent discoveries, excepting perhaps the art of making fire.[58] The Australian boomerang is a good instance of one such independent discovery. The Tahitians when first visited had advanced in many respects beyond the inhabitants of most of the other Polynesian islands. There are no just grounds for the belief that the high culture of the native Peruvians and Mexicans was derived from any foreign source;[59] many native plants were there cultivated, and a few native animals domesticated. We should bear in mind that a wandering crew from some semi-civilised land, if washed to the shores of America, would not, judging from the small influence of most missionaries, have produced any marked effect on the natives, unless they had already become somewhat advanced. Looking to a very remote period in the history of the world, we find, to use Sir J. Lubbock's well-known terms, a paleolithic and neolithic period; and no one will pretend that the art of grinding rough flint tools was a borrowed one. In all parts of Europe, as far east as Greece, in Palestine, India, Japan, New Zealand, and Africa, including Egypt, flint tools have been discovered in abundance; and of their use the existing inhabitants retain no tradition. There is also indirect evidence of their former use by the Chinese and ancient Jews. Hence there can hardly be a doubt that the inhabitants of these many countries, which include nearly the whole civilised world, were once in a barbarous condition. To believe that man was aboriginally civilised and then suffered utter degradation in so many regions, is to take a pitiably low view of human nature. It

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[56] 'Royal Institution of Great Britain,' March 15, 1867. Also, 'Researches into the Early History of Mankind,' 1865.

[57] 'Primitive Marriage,' 1865. See, likewise, an excellent article, evidently by the same author, in the 'North British Review,' July, 1869. Also, Mr. L. H. Morgan, "A Conjectural Solution of the Origin of the Class. System of Relationship," in ' Proc. American Acad. of Sciences,' vol. vii. Feb. 1868. Prof. Schaaffhausen ('Anthropology Review,' Oct. 1869, p. 373) remarks on "the vestiges of human sacrifices found both in Homer and the Old Testament."

[58] Sir J. Lubbock,'Prehistoric Times,' 2nd edit. 1869, chap. xv. and xvi. *et passim*.

[59] Dr. F. Müller has made some good remarks to this effect in the 'Reise der Novara: Anthropolog. Theil,' Abtheil. iii. 1868, s. 127.

is apparently a truer and more cheerful view that progress has been much more general than retrogression; that man has risen, though by slow and interrupted steps, from a lowly condition to the highest standard as yet attained by him in knowledge, morals, and religion.

Matt Ridley, *The Rational Optimist*

Prologue: When Ideas have Sex

> In other classes of animals, the individual advances from infancy to age or maturity; and he attains, in the compass of a single life, to all the perfection his nature can reach: but, in the human kind, the species has a progress as well as the individual; they build in every subsequent age on foundations formerly laid.
>
> ADAM FERGUSON
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> *An Essay on the History of Civil Society*

On my desk as I write sit two artefacts of roughly the same size and shape: one is a cordless computer mouse; the other a hand axe from the Middle Stone Age, half a million years old. Both are designed to fit the human hand—to obey the constraints of being used by human beings. But they are vastly different. One is a complex confection of many substances with intricate internal design reflecting multiple strands of knowledge. The other is a single substance reflecting the skill of a single individual. The difference between them shows that the human experience of today is vastly different from the human experience of half a million years ago.

This book is about the rapid, continuous and incessant change that human society experiences in a way that no other animal does. To a biologist this is something that needs explaining. In the past two decades I have written four books about how similar human beings are to other animals. This book is about how different they are from other animals. What is it about human beings that enables them to keep changing their lives in this tumultuous way?

It is not as if human nature changes. Just as the hand that held the hand axe was the same shape as the hand that holds the mouse, so people always have and always will seek food, desire sex, care for offspring, compete for status and avoid pain just like any other animal. Many of the idiosyncrasies of the human species are unchanging, too. You can travel to the farthest corner of the earth and still expect to encounter singing, smiling, speech, sexual jealousy and a sense of humour—none of which you would find to be the same in a chimpanzee. You could travel back in time and empathise easily with the motives of Shakespeare, Homer, Confucius and the Buddha. If I could meet the man who painted exquisite images of rhinos on the wall of the Chauvet Cave in southern France 32,000 years ago, I have no doubt that I would find him fully human in every psychological way. There is a great deal of human life that does not change.

Yet to say that life is the same as it was 32,000 years ago would be absurd. In that time my species has multiplied by 100,000 per cent, from perhaps three million to nearly seven billion people. It has given itself comforts and luxuries to a level that no other species can even imagine. It has colonised every habitable corner of the planet and explored almost every uninhabitable one. It has altered the appearance, the genetics and the chemistry of the world and pinched perhaps 23 per cent of the productivity of all

land plants for its own purposes. It has surrounded itself with peculiar, non-random arrangements of atoms called technologies, which it invents, reinvents and discards almost continuously. This is not true for other creatures, not even brainy ones like chimpanzees, bottlenose dolphins, parrots and octopi. They may occasionally use tools, they may occasionally shift their ecological niche, but they do not 'raise their standard of living', or experience 'economic growth'. They do not encounter 'poverty' either. They do not progress from one mode of living to another—nor do they deplore doing so. They do not experience agricultural, urban, commercial, industrial and information revolutions, let alone Renaissances, Reformations, Depressions, Demographic Transitions, civil wars, cold wars, culture wars and credit crunches. As I sit here at my desk, I am surrounded by things—telephones, books, computers, photographs, paper clips, coffee mugs—that no monkey has ever come close to making. I am spilling digital information on to a screen in a way that no dolphin has ever managed. I am aware of abstract concepts—the date, the weather forecast, the second law of thermodynamics—that no parrot could begin to grasp. I am definitely different. What is it that makes me so different?

It cannot just be that I have a bigger brain than other animals. After all, late Neanderthals had on average bigger brains than I do, yet did not experience this headlong cultural change. Moreover, big though my brain may be compared with another animal species, I have barely the foggiest inkling how to make coffee cups and paper clips, let alone weather forecasts. The psychologist Daniel Gilbert likes to joke that every member of his profession lives under the obligation at some time in his career to complete a sentence which begins: 'The human being is the only animal that ...' Language, cognitive reasoning, fire, cooking, tool making, self-awareness, deception, imitation, art, religion, opposable thumbs, throwing weapons, upright stance, grandparental care—the list of features suggested as unique to human beings is long indeed. But then the list of features unique to aardvarks or bare-faced go-away birds is also fairly long. All of these features are indeed uniquely human and are indeed very helpful in enabling modern life. But I will contend that, with the possible exception of language, none of them arrived at the right time, or had the right impact in human history to explain the sudden change from a merely successful ape-man to an ever-expanding progressive moderniser. Most of them came much too early in the story and had no such ecological effect. Having sufficient consciousness to want to paint your body or to reason the answer to a problem is nice, but it does not lead to ecological world conquest.

Clearly, big brains and language may be necessary for human beings to cope with a life of technological modernity. Clearly, human beings are very good at social learning, indeed compared with even chimpanzees humans are almost obsessively interested in faithful imitation. But big brains and imitation and language are not themselves the explanation of prosperity and progress and poverty. They do not themselves deliver a changing standard of living. Neanderthals had all of these: huge brains, probably complex languages, lots of technology. But they never burst out of their

niche. It is my contention that in looking inside our heads, we would be looking in the wrong place to explain this extraordinary capacity for change in the species. It was not something that happened within a brain. It was some thing that happened between brains. It was a collective phenomenon.

Look again at the hand axe and the mouse. They are both 'man-made', but one was made by a single person, the other by hundreds of people, maybe even millions. That is what I mean by collective intelligence. No single person knows how to make a computer mouse. The person who assembled it in the factory did not know how to drill the oil well from which the plastic came, or vice versa. At some point, human intelligence became collective and cumulative in a way that happened to no other animal.

Mating minds

To argue that human nature has not changed, but human culture has, does not mean rejecting evolution—quite the reverse. Humanity is experiencing an extraordinary burst of evolutionary change, driven by good old-fashioned Darwinian natural selection. But it is selection among ideas, not among genes. The habitat in which these ideas reside consists of human brains. This notion has been trying to surface in the social sciences for a long time. The French sociologist Gabriel Tarde wrote in 1888: 'We may call it social evolution when an invention quietly spreads through imitation.' The Austrian economist Friedrich Hayek wrote in the 1960s that in social evolution the decisive factor is 'selection by imitation of successful institutions and habits'. The evolutionary biologist Richard Dawkins in 1976 coined the term 'meme' for a unit of cultural imitation. The economist Richard Nelson in the 1980s proposed that whole economies evolve by natural selection.

This is what I mean when I talk of cultural evolution: at some point before 100,000 years ago culture itself began to evolve in a way that it never did in any other species—that is, to replicate, mutate, compete, select and accumulate—somewhat as genes had been doing for billions of years. Just like natural selection cumulatively building an eye bit by bit, so cultural evolution in human beings could cumulatively build a culture or a camera. Chimpanzees may teach each other how to spear bushbabies with sharpened sticks, and killer whales may teach each other how to snatch sea lions off beaches, but only human beings have the cumulative culture that goes into the design of a loaf of bread or a concerto.

Yes, but why? Why us and not killer whales? To say that people have cultural evolution is neither very original nor very helpful. Imitation and learning are not themselves enough, however richly and ingeniously they are practised, to explain why human beings began changing in this unique way. Something else is necessary; something that human beings have and killer whales do not. The answer, I believe, is that at some point in human history, ideas began to meet and mate, to have sex with each other.

Let me explain. Sex is what makes biological evolution cumulative, because it brings together the genes of different individuals. A mutation that occurs in one creature can therefore join forces with a mutation that occurs in another. The analogy is most explicit in bacteria, which trade genes without replicating at the same time—hence their ability to acquire immunity to antibiotics from other species. If microbes had not begun swapping genes a few billion years ago, and animals had not continued doing so through sex, all the genes that make eyes could never have got together in one animal; nor the genes to make legs or nerves or brains. Each mutation would have remained isolated in its own lineage, unable to discover the joys of synergy. Think, in cartoon terms, of one fish evolving a nascent lung, another nascent limbs and neither getting out on land. Evolution can happen without sex; but it is far, far slower.

And so it is with culture. If culture consisted simply of learning habits from others, it would soon stagnate. For culture to turn cumulative, ideas needed to meet and mate. The 'cross-fertilisation of ideas' is a cliché, but one with unintentional fecundity. 'To create is to recombine' said the molecular biologist François Jacob. Imagine if the man who invented the railway and the man who invented the locomotive could never meet or speak to each other, even through third parties. Paper and the printing press, the internet and the mobile phone, coal and turbines, copper and tin, the wheel and steel, software and hardware. I shall argue that there was a point in human pre-history when big-brained, cultural, learning people for the first time began to exchange things with each other, and that once they started doing so, culture suddenly became cumulative, and the great headlong experiment of human economic 'progress' began. Exchange is to cultural evolution as sex is to biological evolution.

By exchanging, human beings discovered 'the division of labour', the specialisation of efforts and talents for mutual gain. It would at first have seemed an insignificant thing, missed by passing primatologists had they driven their time machines to the moment when it was just starting. It would have seemed much less interesting than the ecology, hierarchy and superstitions of the species. But some ape-men had begun exchanging food or tools with others in such a way that both partners to the exchange were better off, and both were becoming more specialised.

Specialisation encouraged innovation, because it encouraged the investment of time in a tool-making tool. That saved time, and prosperity is simply time saved, which is proportional to the division of labour. The more human beings diversified as consumers and specialised as producers, and the more they then exchanged, the better off they have been, are and will be. And the good news is that there is no inevitable end to this process. The more people are drawn into the global division of labour, the more people can specialise and exchange, the wealthier we will all be. Moreover, along the way there is no reason we cannot solve the problems that beset us, of economic crashes, population explosions, climate change and terrorism, of poverty, AIDS, depression and obesity. It will not be easy, but it is perfectly possible, indeed probable, that in the year 2110, a century after this book is published, humanity will be much, much better off than

it is today, and so will the ecology of the planet it inhabits. This book dares the human race to embrace change, to be rationally optimistic and thereby to strive for the betterment of humankind and the world it inhabits.

Some will say that I am merely restating what Adam Smith said in 1776. But much has happened since Adam Smith to change, challenge, adjust and amplify his insight. He did not realise, for instance, that he was living through the early stages of an industrial revolution. I cannot hope to match Smith's genius as an individual, but I have one great advantage over him—I can read his book. Smith's own insight has mated with others since his day.

Moreover, I find myself continually surprised by how few people think about the problem of tumultuous cultural change. I find the world is full of people who think that their dependence on others is decreasing, or that they would be better off if they were more self-sufficient, or that technological progress has brought no improvement in the standard of living, or that the world is steadily deteriorating, or that the exchange of things and ideas is a superfluous irrelevance. And I find a deep incuriosity among trained economists—of which I am not one – about defining what prosperity is and why it happened to their species. So I thought I would satisfy my own curiosity by writing this book.

I am writing in times of unprecedented economic pessimism. The world banking system has lurched to the brink of collapse; an enormous bubble of debt has burst; world trade has contracted; unemployment is rising sharply all around the world as output falls. The immediate future looks bleak indeed, and some governments are planning further enormous public debt expansions that could hurt the next generation's ability to prosper. To my intense regret I played a part in one phase of this disaster as non-executive chairman of Northern Rock, one of many banks that ran short of liquidity during the crisis. This is not a book about that experience (under the terms of my employment there I am not at liberty to write about it). The experience has left me mistrustful of markets in capital and assets, yet passionately in favour of markets in goods and services. Had I only known it, experiments in laboratories by the economist Vernon Smith and his colleagues have long confirmed that markets in goods and services for immediate consumption—haircuts and hamburgers—work so well that it is hard to design them so they fail to deliver efficiency and innovation; while markets in assets are so automatically prone to bubbles and crashes that it is hard to design them so they work at all. Speculation, herd exuberance, irrational optimism, rent-seeking and the temptation of fraud drive asset markets to overshoot and plunge—which is why they need careful regulation, something I always supported. (Markets in goods and services need less regulation.) But what made the bubble of the 2000s so much worse than most was government housing and monetary policy, especially in the United States, which sluiced artificially cheap money towards bad risks as a matter of policy and thus also towards the middlemen of the capital markets. The crisis has at least as much political as economic causation, which is why I also mistrust too much government.

(In the interests of full disclosure, I here note that as well as banking I have over the years worked in or profited directly from scientific research, species conservation, journalism, farming, coal mining, venture capital and commercial property, among other things: experience may have influenced, and has certainly informed, my views of these sectors in the pages that follow. But I have never been paid to promulgate a particular view.)

Rational optimism holds that the world will pull out of the current crisis because of the way that markets in goods, services and ideas allow human beings to exchange and specialise honestly for the betterment of all. So this is not a book of unthinking praise or condemnation of all markets, but it is an inquiry into how the market process of exchange and specialisation is older and fairer than many think and gives a vast reason for optimism about the future of the human race. Above all, it is a book about the benefits of change. I find that my disagreement is mostly with reactionaries of all political colours: blue ones who dislike cultural change, red ones who dislike economic change and green ones who dislike technological change.

I am a rational optimist: rational, because I have arrived at optimism not through temperament or instinct, but by looking at the evidence. In the pages that follow I hope to make you a rational optimist too. First, I need to convince you that human progress has, on balance, been a good thing, and that, despite the constant temptation to moan, the world is as good a place to live as it has ever been for the average human being—even now in a deep recession. That it is richer, healthier, and kinder too, as much because of commerce as despite it. Then I intend to explain why and how it got that way. And finally, I intend to see whether it can go on getting better.

Christopher Ryan, *Civilized to Death*

Introduction: Know Thy Species

Call me ungrateful. I've got silver fillings in my teeth, artisanal beer in my fridge, and a world of music in my pocket. I drive a Japanese car with cruise control, power steering, and air bags poised to cushion me in an explosive embrace should I drift off. I wear German glasses that darken in California sunlight, and I'm writing these words on a computer that's thinner and lighter than the book they'll eventually be printed in. I enjoy the company of friends I'd have lost if they hadn't been saved by emergency surgery, and, for the last seventeen years of his life, my father's blood was filtered through the liver of a man named Chuck Zoerner, who died in 2002. I have every reason to appreciate the many wonders of civilization.

And yet.

When the English author G. K. Chesterton first visited America, in 1921, his hosts took him to see Times Square at night. Chesterton stood staring in silence for several increasingly awkward moments. When someone finally asked him for his thoughts, Chesterton replied: "I was thinking how beautiful this would be if I couldn't read."

Like Chesterton, we can read the signs, and they're not good. The insistent, flashing ads are steadily losing their power to distract us from what many know and most suspect: We're approaching the end of the road. Belief in progress— the promise and premise of civilization-is melting away like a glacier.

But what about antibiotics and airplanes, women's rights, gay marriage? True enough. But upon closer inspection, many of the supposed gifts of civilization turn out to be little more than partial compensation for what we've already paid, or they cause as much trouble as they claim to solve.

Most of the infectious diseases vaccines protect us from, for example, were never a problem until humans began living with domesticated animals from which pathogens jumped over to our species. Influenza, chicken pox, tuberculosis, cholera, heart disease, depression, malaria, tooth decay, most types of cancer, and just about every other major ailment responsible for causing massive suffering to our species derive their lethality from some aspect of civilization: domesticated animals, densely populated towns and cities, open sewers, food contaminated with pesticides, disruptions to our microbiome, and so on.

Within just a few years of unlocking the miracle of flight, pilots were flying with one hand while tossing bombs on civilians with the other. And only in the most progressive modern societies are LGBTQ people and women regaining the acceptance and respect they typically received in most foraging societies.[60] Reports of progress have

[60] I'll use "forager," "hunter-gatherer," and "uncivilized" interchangeably, to avoid repetition. In every case, unless otherwise noted, I'm referring to what anthropologists call "immediate return hunter-gatherers," people who do not typically accumulate food, but eat what they find as they find it.

a tendency to be wildly overstated and uncritically accepted, while anyone who questions the benefits of civilization is liable to be dismissed as cynical, utopian, or some hybrid of both.

"An era can be considered over," said Arthur Miller, "when its basic illusions have been exhausted." Progress, surely the basic illusion of our era, is spent. Dystopian scenarios loom ever larger as fisheries collapse, CO_2 levels rise, and clouds of radioactive steam billow from "fail-safe" nuclear plants. Oil gushes into oceans, mutating pathogens overwhelm the last effective antibiotics, and the living dead stumble through our collective unconscious. Each successive year is the hottest on record, and the next undeclared war ignites from the embers of the previous while political parties nominate charlatans who can't agree on what's happening, much less what to do about it. Despite the marvels of our age-or maybe partly because of them —these are deeply troubled times.

It's common to wonder what sage advice an emissary from the future might bring back to help us choose the best path forward. But consider the opposite scenario. How would a time traveler from the prehistoric past assess the state and trajectory of the modern world? She would no doubt be impressed by much of what she encountered here, but once her amazement at mobile phones, air travel, and self-driving cars subsided, what would she make of the substance and meaning of our lives? Would she be more awed by our doodads or dismayed by what we've left behind in our rush toward an increasingly precarious future?

This question isn't as hypothetical as it seems. Missionaries, explorers, adventurers, and anthropologists have been consistently confused and disappointed by indigenous people's rejection of the comforts and constraints of civilization. "Why should I learn to farm," asked a !Kung San man, "when there are so many mongongo nuts in the world?" In a letter to a friend, Benjamin Franklin noted how little interest Indians had in joining civilization: "They have never shown any inclination to change their manner of life for ours. When an Indian child has been brought up among us, taught our language and habituated to our customs, yet if he goes to see his relations and make one Indian ramble with them, there is no persuading him ever to return." And when white children got a taste of Indian life (generally due to having been kidnapped), they also preferred it, according to Franklin. After their rescue, "in a short time they become disgusted with our manner of life, and the care and pains that are necessary to support it, and take the first good opportunity of escaping again into the woods."

Charles Darwin saw firsthand how difficult it was to sell native people on civilization. Passing through Tierra del Fuego on the *Beagle*, he was amazed by what seemed to him to be the squalor and degradation of the people living at the cold and stormy southernmost tip of the Americas. In a letter to a friend, Darwin wrote: "I have seen nothing, which more completely astonished me, than the first sight of a Savage; It was a naked Fuegian his long hair blowing about, his face besmeared with paint." In his

journal, Darwin wrote, "I believe if the world was searched, no lower grade of man could be found."

On an earlier trip, the *Beagle*'s captain, Robert FitzRoy, had abducted three Fuegians, two children-whom the British called Fuegia Basket and Jemmy Button-and a young man they called York Minister. The kidnapping was justified, FitzRoy felt, because "the ultimate benefits arising from their acquaintance with our habits and language, would make up for the temporary separation from their own country." FitzRoy had taken them back to England, where they spent over a year being indoctrinated into civilized life-even meeting King William IV and Queen Adelaide during their stay. Now familiar with the obvious superiority of European society, they were on the *Beagle* with Darwin, headed back to their own people in Tierra del Fuego so they could preach the good word concerning the proper, civilized approach to life.

But when the *Beagle* returned to Woolya Cove, near what is now called Mount Darwin, just a year after dropping them off, Jemmy, York, and Fuegia were nowhere to be found. The huts and gardens the British sailors had built for the three Fuegians were deserted and overgrown. Eventually, Jemmy was located and joined Darwin and FitzRoy for dinner on the ship, where he confirmed that the Fuegians had abandoned their civilized ways. Overcome with sadness, Darwin wrote that he'd never seen "so complete & grievous a change" and that "it was painful to behold him." (Darwin noted that Jemmy hadn't forgotten how to use a knife and fork properly.) When Captain FitzRoy offered transport back to England, Jemmy declined, saying he had "not the least wish to return to England" as he was happy and contented with "plenty fruits," "plenty fish," and "plenty birdies."[61]

* * *

Carl Jung lamented our drift from the past and the "uprooted-ness" that led people to live "more in the future and its chimerical promises of a golden age than in the present, with which our whole evolutionary background has not yet caught up." Writing in his memoir, *Memories, Dreams, Reflections*, Jung couldn't have been clearer in lamenting our species' drift into future-fantasy: "We rush impetuously into novelty, driven by a mounting sense of insufficiency, dissatisfaction, and restlessness. We no longer live on what we have, but on promises, no longer in the light of the present day, but in the darkness of the future, which, we expect, will at last bring a proper sunrise. We refuse to recognize that everything better is purchased at the price of something worse."

In a 1928 essay called "Economic Possibilities for Our Grandchildren," the famous economist John Maynard Keynes imagined the world a century into the future. Things

[61] Twenty-five years later, in late 1859, within days of the publication of *On the Origin of Species by means of Natural Selection or the Preservation of Favored Races in the Struggle for Life*, Jemmy Button led an attack on a party of Christian missionaries in Tierra del Fuego, killing eight of them. And FitzRoy? After delivering young Charles Darwin and his revolutionary ideas back to England, Captain FitzRoy invented the science of weather forecasting and brought about a revolution in meteorology: But for all his scientific accomplishments, FitzRoy remained a deeply pious man, and the publication of *Origin of Species* mortified him.

would be so good, he predicted, that no one would need to worry about making money. The principal problem people would face would be figuring out what to do with their overwhelming amount of free time: "For the first time since his creation man will be faced with his real, his permanent problem," Keynes wrote, "how to use his freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won."

Well, here we are in that much anticipated future, and the average American is as frazzled and desperate as ever, working as many hours today as he or she did in 1970 and lucky to get a couple of weeks off per year. It's technically true that measures of global wealth are up in the past few decades, but, at least in Europe and the United States, almost all the surplus wealth has gone to those who need it least, leaving the rest further behind than ever.

And not even the luckiest among us are really all that comfortable. Forty-four percent of Americans earning between $40,000 and $100,000 per year told researchers that they couldn't come up with $400 in an emergency, and 27 percent of those making more than $100,000 said the same. Globally, gross domestic product (GDP) increased 271 percent between 1990 and 2014, yet the number of people living on less than five dollars a day rose 10 percent in the same period, and the number of people going hungry increased by 9 percent.

Ah, the glorious, leisurely future—always just around the corner. Think I'm being too harsh? Evolutionary biologist Stephen Jay Gould called the very notion of progress "a noxious, culturally embedded, untestable, nonoperational, intractable idea that must be replaced if we wish to understand the patterns of history." While a bit more diplomatic, Jared Diamond isn't convinced by the pro-progress propaganda, either, suggesting that words such as "civilization" and the phrase "the rise of civilization" falsely imply "that civilization is good, tribal hunter-gatherers are miserable, and history for the past 13,000 years has involved progress toward greater human happiness." But Diamond doesn't buy it, writing, "I do not assume that industrialized states are 'better' than hunter-gatherer tribes, or that the abandonment of the hunter-gatherer lifestyle for iron-based statehood represents 'progress,' or that it has led to an increase in human happiness."

But I hear the progress lovers, the true believers in the self-evident notion that we're fulfilling our destiny as the planet's chosen species by progressing toward some asymptotic goal that grows ever closer—even if it never quite arrives. I don't dispute the reality of progress in certain contexts, but I have my doubts about how to conceptualize and measure it. We tend to confuse progress with adaptation, for example. Adaptation—and, by extension, evolution—doesn't presuppose that a species is getting "better" as it evolves, merely that it is growing more suited to its environment. The "fittest" may survive and reproduce, but "fitness" is a concept that exists only within a specific ecological context, having no absolute, noncontextual meaning or value. Male Egyptian vultures, for example, smear shit all over their faces—presumably to

demonstrate their immunological prowess to females. This particular fitness display is probably not so effective in other species.

It often seems to me that we are progressing either toward a modern manifestation of our distant past or toward a precipice. Our desperate peregrinations are in search of a place much like the home we left when we walked out of the garden and started to farm. Our most urgent dreams may simply reflect the world as it was before we fell asleep.

Perhaps we're approaching the so-called singularity, when our comfort-atrophied bodies melt into the screens we spend so much of our lives staring into. Or perhaps the colonization of other planets will allow our descendants to live in distant domes sponsored by Apple, Tesla, and Caesars Palace. If you, like Keynes, were hoping for an egalitarian world of shared plenitude and lots of free time to enjoy the company of those you love, consider that our ancestors occupied a world very much like that until the advent of agriculture and what came to be called "civilization" sprouted about ten thousand years ago, and we've been progressing away from it ever since.

When you're going in the wrong direction, progress is the last thing you need. The "progress" that defines our age often seems closer to the progression of a disease than to its cure. Civilization often seems to be picking up speed in the dizzying way things do when they're circling the drain. Could it be that the fiercely held belief in progress is a sort of painkiller— a faith-in-the-future antidote to a present too terrifying to contemplate?

I know, there's always been some lunatic warning that the end was nigh and he's always said, "This time it's different!" But seri-ously, this time it's different. Headlines like "We're Doomed. Now What?" loom from the pages of major newspapers. The planetary climate is shifting like cargo on a sinking ship. The UN high commissioner for refugees reports that at the end of 2015, the number of people forcibly displaced by war, conflict, and persecution had risen to a staggering 65.3 million, up from 37.5 million in 2004. Flocks of birds are falling dead from the sky, the buzzing of bees is fading, butterfly migrations have stopped, and vital ocean currents are slowing. Species are going extinct at a rate not seen since the dinosaurs vanished 65 million years ago. Texas-sized masses of swirling plastic soup suffocate acidifying oceans while freshwater aquifers are pumped dry as a bone. Ice caps melt down as clouds of methane bubble up from the depths, accelerating the cycle of global destruction. Governments look away while Wall Street tears the last bits of wealth from the carcass of the middle class and energy companies frack the earth, pumping secret poisons into aquifers we all depend on but don't know how to protect. Little wonder that depression is the leading cause of disability in the world, and is growing quickly.

The state of things is shocking and worrisome, but shouldn't surprise us. Every civilization that's ever existed has collapsed into chaos and confusion. Why presume that ours will break the pattern? But there *is* a difference: While Rome, Sumer, the Mayans, ancient Egypt, Easter Island, and the others ended in regional collapses, the civilization

imploding around us now is global. As Canadian historian Ronald Wright put it, "Each time history repeats itself, the price goes up."

Maybe you think that the end of the world is beside the point. Perhaps the sublime beauty of Beethoven's late quartets, photos of Earth taken from space, or knowledge of the structure of DNA are worth any price to you—even the otherworldly price we and the other creatures on this planet are paying. Maybe your life, or the life of someone you love, was saved by technological medicine— which makes it both confusing and distasteful for you to be anything less than a full-throated fan of progress. Maybe you have faith that self-organizing coalitions of smart, decent people will find a way to make corrective memes go viral—rapidly infecting our species, just in time, with some common fucking sense.

Whether the wonders of our age are worth their exorbitant cost is a question each of us must ultimately answer for ourselves. But before we can begin to answer such a crucial question, we must first cut through the veil of pro-progress propaganda to which we've been subjected for centuries in order to do two things: get a fuller conception of civilization that includes its costs and victims, and think hard about how much meaning and fulfillment "modern wonders" actually bring to our lives. If everything's so amazing, why are so many of us so profoundly unhappy?

The widespread belief that noncivilized human life was and is a desperate struggle for survival resonates with the haughty dismissal of uncivilized "savages" common to previous centuries. But beyond its inaccuracy and racist undertones, this view has disastrous consequences in the present. Life-and-death medical decisions are misinformed by false assumptions about the capacities of the human body, relationships fall short of unrealistic expectations, legal systems based on inaccurate notions of human nature generate the very suffering they're meant to avert, educational institutions smother the innate curiosity of students, and so on. Indeed, nearly every aspect of our lives (and our deaths) is distorted by a misinformed sense of what kind of animal *Homo sapiens* really is.

Dr. Jonas Salk, famous for having invented the polio vaccine, put it memorably: "It is necessary now not only to 'know thyself; but also to 'know thy species' and to understand the 'wisdom' of nature, and especially living nature, if we are to understand and help man develop his own wisdom in a way that will lead to life of such quality as to make living a desirable and fulfilling experience."

But how many of us know our species well enough to know ourselves? For centuries, we've been misinformed about what kind of creature we were, are, and can be. The resulting confusion undermines our attempts to live "desirable and fulfilling" lives. Lies can be repeated so frequently that they become indistinguishable from the voices in our heads: *Civilization is humankind's greatest accomplishment. Progress is undeniable. You're lucky to be alive here and now. Any doubt, despair, or disappointment you feel is your own fault. Get over it. Walk it off. Take a pill and stop complaining.*

To be clear, I harbor no illusions about "noble savages" or "getting back to the garden." To the extent the savages are or ever were noble, we'll see that it's because their societies flourished by promoting generosity, honesty, and mutual respect—values, not coincidentally, still cherished by most modern humans at a gut level. There were concrete, survival-based reasons for our highly interdependent hunter-gatherer ancestors to honor these values and personality characteristics—and for evolution to promulgate them through sexual selection because women found them to be attractive qualities in men. As for Paradise, it's long since been paved over. We've come too far, and there's no going back. Human population levels long ago surpassed the carrying capacity of hunter-gatherer ways that require population densities lower than one person per square mile in most ecosystems. In any case, we're no longer the undomesticated beings our prehistoric ancestors were. We've lost too much of the knowledge and physical conditioning necessary to live comfortably under the stars. If our ancestors were wolves or coyotes, most of us are closer to pugs or poodles.

Years ago, I stumbled upon what might be the saddest zoo in the world, in Bukittinggi, on the Indonesian island of Sumatra. The place was nothing more than a bunch of dismal concrete cages in which a few doomed orangutans languished. I'll never forget the look in their eyes, as they reached out to me from behind rusted iron bars, begging for release, contact, death… anything but more of the same. After this intimate look at animals suffering from what I later learned is sometimes called "zoochosis," I didn't go near a zoo again for decades. But eventually, a friend persuaded me to visit the bonobos in San Diego. To call both facilities "zoos" is to highlight the paucity of language. Whatever your opinions concerning animals in captivity, the San Diego Zoo reflects a serious desire to create an artificial world that is as similar to the environments in which each species evolved as possible. The people who designed the enclosures had clearly studied the natural contexts and behavior of the animals destined to live there. Native habitats were re-created, allowing at least a simulacrum of wildness within the walls.

It's difficult to settle on one element that sets *Homo sapiens sapiens* apart from all other animals. The list of failed candidates is long and includes things like tool use, cultivation of other species for food, nonreproductive sexual behavior, eye contact during sex, female orgasm, organized group conflict, and transmission of knowledge from one generation to the next. Here's my pitch: We are the only species that lives in zoos of our own design. Each day, we create the world we and our descendants are going to inhabit. If we want that world to be more like the San Diego Zoo than the living tombs in Bukittinggi, we'll need a clearer understanding of what human life was like before our ancestors first woke up in cages. We'll need to know our species.

Thomas Hobbes, *Leviathan*

Chapter XIII, Of the Natural Condition of Mankind, As Concerning Their Felicity, and Misery

1 Nature hath made men so equal in the faculties of body and mind as that, though there be found one man sometimes manifestly stronger in body or of quicker mind than another, yet when all is reckoned together the difference between man and man is not so considerable as that one man can thereupon claim to himself any benefit to which another may not pretend as well as he. For as to the strength of body, the weakest has strength enough to kill the strongest, either by secret machination or by confederacy with others that are in the same danger with himself.

2 And as to the faculties of the mind, setting aside the arts grounded upon words, and especially that skill of proceeding upon general and infallible rules, called science, which very few have and but in few things, as being not a native faculty born with us, nor attained, as prudence, while we look after somewhat else, I find yet a greater equality amongst men than that of strength. For prudence is but experience, which equal time equally bestows on all men in those things they equally apply themselves unto. That which may perhaps make such equality incredible is but a vain conceit of one's own wisdom, which almost all men think they have in a greater degree than the vulgar; that is, than all men but themselves, and a few others, whom by fame, or for concurring with themselves, they approve. For such is the nature of men that howsoever they may acknowledge many others to be more witty, or more eloquent or more learned, yet they will hardly believe there be many so wise as themselves; for they see their own wit at hand, and other men's at a distance. But this proveth rather that men are in that point equal, than unequal. For there is not ordinarily a greater sign of the equal distribution of anything than that every man is contented with his share.

3 From this equality of ability ariseth equality of hope in the attaining of our ends. And therefore if any two men desire the same thing, which nevertheless they cannot both enjoy, they become enemies; and in the way to their end (which is principally their own conservation, and sometimes their delectation only) endeavour to destroy or subdue one another. And from hence it comes to pass that where an invader hath no more to fear than another man's single power, if one plant, sow, build, or possess a convenient seat, others may probably be expected to come prepared with forces united to dispossess and deprive him, not only of the fruit of his labour, but also of his life or liberty. And the invader again is in the like danger of another.

4 And from this diffidence of one another, there is no way for any man to secure himself so reasonable as anticipation; that is, by force, or wiles, to master the persons of all men he can so long till he see no other power great enough to endanger him: and this is no more than his own conservation requireth, and is

generally allowed. Also, because there be some that, taking pleasure in contemplating their own power in the acts of conquest, which they pursue farther than their security requires, if others, that otherwise would be glad to be at ease within modest bounds, should not by invasion increase their power, they would not be able, long time, by standing only on their defence, to subsist. And by consequence, such augmentation of dominion over men being necessary to a man's conservation, it ought to be allowed him.

5 Again, men have no pleasure (but on the contrary a great deal of grief) in keeping company where there is no power able to overawe them all. For every man looketh that his companion should value him at the same rate he sets upon himself, and upon all signs of contempt or undervaluing naturally endeavours, as far as he dares (which amongst them that have no common power to keep them in quiet is far enough to make them destroy each other), to extort a greater value from his contemners, by damage; and from others, by the example.

6 So that in the nature of man, we find three principal causes of quarrel. First, competition; secondly, diffidence; thirdly, glory.

7 The first maketh men invade for gain; the second, for safety; and the third, for reputation. The first use violence, to make themselves masters of other men's persons, wives, children, and cattle; the second, to defend them; the third, for trifles, as a word, a smile, a different opinion, and any other sign of undervalue, either direct in their persons or by reflection in their kindred, their friends, their nation, their profession, or their name.

8 Hereby it is manifest that during the time men live without a common power to keep them all in awe, they are in that condition which is called war; and such a war as is of every man against every man. For war consisteth not in battle only, or the act of fighting, but in a tract of time, wherein the will to contend by battle is sufficiently known: and therefore the notion of time is to be considered in the nature of war, as it is in the nature of weather. For as the nature of foul weather lieth not in a shower or two of rain, but in an inclination thereto of many days together: so the nature of war consisteth not in actual fighting, but in the known disposition thereto during all the time there is no assurance to the contrary. All other time is peace.

9 Whatsoever therefore is consequent to a time of war, where every man is enemy to every man, the same consequent to the time wherein men live without other security than what their own strength and their own invention shall furnish them withal. In such condition there is no place for industry, because the fruit thereof is uncertain: and consequently no culture of the earth; no navigation, nor use of the commodities that may be imported by sea; no commodious building; no instruments of moving and removing such things as require much force; no knowledge of the face of the earth; no account of time; no arts; no letters; no society; and which is worst of all, continual fear, and danger of violent death; and the life of man, solitary, poor, nasty, brutish, and short.

10 It may seem strange to some man that has not well weighed these things that Nature should thus dissociate and render men apt to invade and destroy one another: and he may therefore, not trusting to this inference, made from the passions, desire perhaps to have the same confirmed by experience. Let him therefore consider with himself: when taking a journey, he arms himself and seeks to go well accompanied; when going to sleep, he locks his doors; when even in his house he locks his chests; and this when he knows there be laws and public officers, armed, to revenge all injuries shall be done him; what opinion he has of his fellow subjects, when he rides armed; of his fellow citizens, when he locks his doors; and of his children, and servants, when he locks his chests. Does he not there as much accuse mankind by his actions as I do by my words? But neither of us accuse man's nature in it. The desires, and other passions of man, are in themselves no sin. No more are the actions that proceed from those passions till they know a law that forbids them; which till laws be made they cannot know, nor can any law be made till they have agreed upon the person that shall make it.

11 It may peradventure be thought there was never such a time nor condition of war as this; and I believe it was never generally so, over all the world: but there are many places where they live so now. For the savage people in many places of America, except the government of small families, the concord whereof dependeth on natural lust, have no government at all, and live at this day in that brutish manner, as I said before. Howsoever, it may be perceived what manner of life there would be, where there were no common power to fear, by the manner of life which men that have formerly lived under a peaceful government use to degenerate into a civil war.

12 But though there had never been any time wherein particular men were in a condition of war one against another, yet in all times kings and persons of sovereign authority, because of their independency, are in continual jealousies, and in the state and posture of gladiators, having their weapons pointing, and their eyes fixed on one another; that is, their forts, garrisons, and guns upon the frontiers of their kingdoms, and continual spies upon their neighbours, which is a posture of war. But because they uphold thereby the industry of their subjects, there does not follow from it that misery which accompanies the liberty of particular men.

13 To this war of every man against every man, this also is consequent; that nothing can be unjust. The notions of right and wrong, justice and injustice, have there no place. Where there is no common power, there is no law; where no law, no injustice. Force and fraud are in war the two cardinal virtues. Justice and injustice are none of the faculties neither of the body nor mind. If they were, they might be in a man that were alone in the world, as well as his senses and passions. They are qualities that relate to men in society, not in solitude. It is consequent also to the same condition that there be no propriety, no dominion,

no mine and thine distinct; but only that to be every man's that he can get, and for so long as he can keep it. And thus much for the ill condition which man by mere nature is actually placed in; though with a possibility to come out of it, consisting partly in the passions, partly in his reason.

14 The passions that incline men to peace are: fear of death; desire of such things as are necessary to commodious living; and a hope by their industry to obtain them. And reason suggesteth convenient articles of peace upon which men may be drawn to agreement. These articles are they which otherwise are called the laws of nature, whereof I shall speak more particularly in the two following chapters.

Chapter XVII, Of the Causes, Generation, and Definition of a Commonwealth

1 The final cause, end, or design of men (who naturally love liberty, and dominion over others) in the introduction of that restraint upon themselves, in which we see them live in Commonwealths, is the foresight of their own preservation, and of a more contented life thereby; that is to say, of getting themselves out from that miserable condition of war which is necessarily consequent, as hath been shown, to the natural passions of men when there is no visible power to keep them in awe, and tie them by fear of punishment to the performance of their covenants, and observation of those laws of nature set down in the fourteenth and fifteenth chapters.

2 For the laws of nature, as justice, equity, modesty, mercy, and, in sum, doing to others as we would be done to, of themselves, without the terror of some power to cause them to be observed, are contrary to our natural passions, that carry us to partiality, pride, revenge, and the like. And covenants, without the sword, are but words and of no strength to secure a man at all. Therefore, notwithstanding the laws of nature (which every one hath then kept, when he has the will to keep them, when he can do it safely), if there be no power erected, or not great enough for our security, every man will and may lawfully rely on his own strength and art for caution against all other men. And in all places, where men have lived by small families, to rob and spoil one another has been a trade, and so far from being reputed against the law of nature that the greater spoils they gained, the greater was their honour; and men observed no other laws therein but the laws of honour; that is, to abstain from cruelty, leaving to men their lives and instruments of husbandry. And as small families did then; so now do cities and kingdoms, which are but greater families (for their own security), enlarge their dominions upon all pretences of danger, and fear of invasion, or assistance that may be given to invaders; endeavour as much as they can to subdue or weaken their neighbours by open force, and secret arts, for want of other caution, justly; and are remembered for it in after ages with honour.

3 Nor is it the joining together of a small number of men that gives them this security; because in small numbers, small additions on the one side or the other make the advantage of strength so great as is sufficient to carry the victory, and therefore gives encouragement to an invasion. The multitude sufficient to confide in for our security is not determined by any certain number, but by comparison with the enemy we fear; and is then sufficient when the odds of the enemy is not of so visible and conspicuous moment to determine the event of war, as to move him to attempt.

4 And be there never so great a multitude; yet if their actions be directed according to their particular judgements, and particular appetites, they can expect thereby no defence, nor protection, neither against a common enemy, nor against the injuries of one another. For being distracted in opinions concerning the best use and application of their strength, they do not help, but hinder one another, and reduce their strength by mutual opposition to nothing: whereby they are easily, not only subdued by a very few that agree together, but also, when there is no common enemy, they make war upon each other for their particular interests. For if we could suppose a great multitude of men to consent in the observation of justice, and other laws of nature, without a common power to keep them all in awe, we might as well suppose all mankind to do the same; and then there neither would be, nor need to be, any civil government or Commonwealth at all, because there would be peace without subjection.

5 Nor is it enough for the security, which men desire should last all the time of their life, that they be governed and directed by one judgement for a limited time; as in one battle, or one war. For though they obtain a victory by their unanimous endeavour against a foreign enemy, yet afterwards, when either they have no common enemy, or he that by one part is held for an enemy is by another part held for a friend, they must needs by the difference of their interests dissolve, and fall again into a war amongst themselves.

6 It is true that certain living creatures, as bees and ants, live sociably one with another (which are therefore by Aristotle numbered amongst political creatures), and yet have no other direction than their particular judgements and appetites; nor speech, whereby one of them can signify to another what he thinks expedient for the common benefit: and therefore some man may perhaps desire to know why mankind cannot do the same. To which I answer,

7 First, that men are continually in competition for honour and dignity, which these creatures are not; and consequently amongst men there ariseth on that ground, envy, and hatred, and finally war; but amongst these not so.

8 Secondly, that amongst these creatures the common good differeth not from the private; and being by nature inclined to their private, they procure thereby the common benefit. But man, whose joy consisteth in comparing himself with other men, can relish nothing but what is eminent.

9 Thirdly, that these creatures, having not, as man, the use of reason, do not see, nor think they see, any fault in the administration of their common business: whereas amongst men there are very many that think themselves wiser and abler to govern the public better than the rest, and these strive to reform and innovate, one this way, another that way; and thereby bring it into distraction and civil war.

10 Fourthly, that these creatures, though they have some use of voice in making known to one another their desires and other affections, yet they want that art of words by which some men can represent to others that which is good in the likeness of evil; and evil, in the likeness of good; and augment or diminish the apparent greatness of good and evil, discontenting men and troubling their peace at their pleasure.

11 Fifthly, irrational creatures cannot distinguish between injury and damage; and therefore as long as they be at ease, they are not offended with their fellows: whereas man is then most troublesome when he is most at ease; for then it is that he loves to show his wisdom, and control the actions of them that govern the Commonwealth.

12 Lastly, the agreement of these creatures is natural; that of men is by covenant only, which is artificial: and therefore it is no wonder if there be somewhat else required, besides covenant, to make their agreement constant and lasting; which is a common power to keep them in awe and to direct their actions to the common benefit.

13 The only way to erect such a common power, as may be able to defend them from the invasion of foreigners, and the injuries of one another, and thereby to secure them in such sort as that by their own industry and by the fruits of the earth they may nourish themselves and live contentedly, is to confer all their power and strength upon one man, or upon one assembly of men, that may reduce all their wills, by plurality of voices, unto one will: which is as much as to say, to appoint one man, or assembly of men, to bear their person; and every one to own and acknowledge himself to be author of whatsoever he that so beareth their person shall act, or cause to be acted, in those things which concern the common peace and safety; and therein to submit their wills, every one to his will, and their judgements to his judgement. This is more than consent, or concord; it is a real unity of them all in one and the same person, made by covenant of every man with every man, in such manner as if every man should say to every man: I authorise and give up my right of governing myself to this man, or to this assembly of men, on this condition; that thou give up, thy right to him, and authorise all his actions in like manner. This done, the multitude so united in one person is called a Commonwealth; in Latin, Civitas. This is the generation of that great Leviathan, or rather, to speak more reverently, of that mortal god to which we owe, under the immortal God, our peace and defence. For by this authority, given him by every particular man in the Commonwealth, he hath the use of so

much power and strength conferred on him that, by terror thereof, he is enabled to form the wills of them all, to peace at home, and mutual aid against their enemies abroad. And in him consisteth the essence of the Commonwealth; which, to define it, is: one person, of whose acts a great multitude, by mutual covenants one with another, have made themselves every one the author, to the end he may use the strength and means of them all as he shall think expedient for their peace and common defence.

14 And he that carryeth this person is called sovereign, and said to have sovereign power; and every one besides, his subject.

15 The attaining to this sovereign power is by two ways. One, by natural force: as when a man maketh his children to submit themselves, and their children, to his government, as being able to destroy them if they refuse; or by war subdueth his enemies to his will, giving them their lives on that condition. The other, is when men agree amongst themselves to submit to some man, or assembly of men, voluntarily, on confidence to be protected by him against all others. This latter may be called a political Commonwealth, or Commonwealth by Institution; and the former, a Commonwealth by acquisition. And first, I shall speak of a Commonwealth by institution.

Chapter XVIII, Of the Rights of Sovereigns by Institution

1 A commonwealth is said to be instituted when a multitude of men do agree, and covenant, every one with every one, that to whatsoever man, or assembly of men, shall be given by the major part the right to present the person of them all, that is to say, to be their representative; every one, as well he that voted for it as he that voted against it, shall authorize all the actions and judgements of that man, or assembly of men, in the same manner as if they were his own, to the end to live peaceably amongst themselves, and be protected against other men.

2 From this institution of a Commonwealth are derived all the rights and faculties of him, or them, on whom the sovereign power is conferred by the consent of the people assembled.

3 First, because they covenant, it is to be understood they are not obliged by former covenant to anything repugnant hereunto. And consequently they that have already instituted a Commonwealth, being thereby bound by covenant to own the actions and judgements of one, cannot lawfully make a new covenant amongst themselves to be obedient to any other, in anything whatsoever, without his permission. And therefore, they that are subjects to a monarch cannot without his leave cast off monarchy and return to the confusion of a disunited multitude; nor transfer their person from him that beareth it to another man, other assembly of men: for they are bound, every man to every man, to own and be reputed author of all that already is their sovereign shall do and judge fit to be done; so that any one man dissenting, all the rest should break their covenant made to

that man, which is injustice: and they have also every man given the sovereignty to him that beareth their person; and therefore if they depose him, they take from him that which is his own, and so again it is injustice. Besides, if he that attempteth to depose his sovereign be killed or punished by him for such attempt, he is author of his own punishment, as being, by the institution, author of all his sovereign shall do; and because it is injustice for a man to do anything for which he may be punished by his own authority, he is also upon that title unjust. And whereas some men have pretended for their disobedience to their sovereign a new covenant, made, not with men but with God, this also is unjust: for there is no covenant with God but by mediation of somebody that representeth God's person, which none doth but God's lieutenant who hath the sovereignty under God. But this pretence of covenant with God is so evident a lie, even in the pretenders' own consciences, that it is not only an act of an unjust, but also of a vile and unmanly disposition.

4 Secondly, because the right of bearing the person of them all is given to him they make sovereign, by covenant only of one to another, and not of him to any of them, there can happen no breach of covenant on the part of the sovereign; and consequently none of his subjects, by any pretence of forfeiture, can be freed from his subjection. That he which is made sovereign maketh no covenant with his subjects before hand is manifest; because either he must make it with the whole multitude, as one party to the covenant, or he must make a several covenant with every man. With the whole, as one party, it is impossible, because as they are not one person: and if he make so many several covenants as there be men, those covenants after he hath the sovereignty are void; because what act soever can be pretended by any one of them for breach thereof is the act both of himself, and of all the rest, because done in the person, and by the right of every one of them in particular. Besides, if any one or more of them pretend a breach of the covenant made by the sovereign at his institution, and others or one other of his subjects, or himself alone, pretend there was no such breach, there is in this case no judge to decide the controversy: it returns therefore to the sword again; and every man recovereth the right of protecting himself by his own strength, contrary to the design they had in the institution. It is therefore in vain to grant sovereignty by way of precedent covenant. The opinion that any monarch receiveth his power by covenant, that is to say, on condition, proceedeth from want of understanding this easy truth: that covenants being but words, and breath, have no force to oblige, contain, constrain, or protect any man, but what it has from the public sword; that is, from the untied hands of that man, or assembly of men, that hath the sovereignty, and whose actions are avouched by them all, and performed by the strength of them all, in him united. But when an assembly of men is made sovereign, then no man imagineth any such covenant to have passed in the institution: for no man is so dull as to say, for example, the people of Rome made a covenant with the Romans to hold the sovereignty on

such or such conditions; which not performed, the Romans might lawfully depose the Roman people. That men see not the reason to be alike in a monarchy and in a popular government proceedeth from the ambition of some that are kinder to the government of an assembly, whereof they may hope to participate, than of monarchy, which they despair to enjoy.

5 Thirdly, because the major part hath by consenting voices declared a sovereign, he that dissented must now consent with the rest; that is, be contented to avow all the actions he shall do, or else justly be destroyed by the rest. For if he voluntarily entered into the congregation of them that were assembled, he sufficiently declared thereby his will, and therefore tacitly covenanted, to stand to what the major part should ordain: and therefore if he refuse to stand thereto, or make protestation against any of their decrees, he does contrary to his covenant, and therefore unjustly. And whether he be of the congregation or not, and whether his consent be asked or not, he must either submit to their decrees or be left in the condition of war he was in before; wherein he might without injustice be destroyed by any man whatsoever.

6 Fourthly, because every subject is by this institution author of all the actions and judgements of the sovereign instituted, it follows that whatsoever he doth, can be no injury to any of his subjects; nor ought he to be by any of them accused of injustice. For he that doth anything by authority from another doth therein no injury to him by whose authority he acteth: but by this institution of a Commonwealth every particular man is author of all the sovereign doth; and consequently he that complaineth of injury from his sovereign complaineth of that whereof he himself is author, and therefore ought not to accuse any man but himself; no, nor himself of injury, because to do injury to oneself is impossible. It is true that they that have sovereign power may commit iniquity, but not injustice or injury in the proper signification.

7 Fifthly, and consequently to that which was said last, no man that hath sovereign power can justly be put to death, or otherwise in any manner by his subjects punished. For seeing every subject is author of the actions of his sovereign, he punisheth another for the actions committed by himself.

8 And because the end of this institution is the peace and defence of them all, and whosoever has right to the end has right to the means, it belonged of right to whatsoever man or assembly that hath the sovereignty to be judge both of the means of peace and defence, and also of the hindrances and disturbances of the same; and to do whatsoever he shall think necessary to be done, both beforehand, for the preserving of peace and security, by prevention of discord at home, and hostility from abroad; and when peace and security are lost, for the recovery of the same. And therefore,

9 Sixthly, it is annexed to the sovereignty to be judge of what opinions and doctrines are averse, and what conducing to peace; and consequently, on what occasions, how far, and what men are to be trusted withal in speaking to

multitudes of people; and who shall examine the doctrines of all books before they be published. For the actions of men proceed from their opinions, and in the well governing of opinions consisteth the well governing of men's actions in order to their peace and concord. And though in matter of doctrine nothing to be regarded but the truth, yet this is not repugnant to regulating of the same by peace. For doctrine repugnant to peace can no more be true, than peace and concord can be against the law of nature. It is true that in a Commonwealth, where by the negligence or unskillfulness of governors and teachers false doctrines are by time generally received, the contrary truths may be generally offensive: yet the most sudden and rough bustling in of a new truth that can be does never break the peace, but only sometimes awake the war. For those men that are so remissly governed that they dare take up arms to defend or introduce an opinion are still in war; and their condition, not peace, but only a cessation of arms for fear of one another; and they live, as it were, in the precincts of battle continually. It belonged therefore to him that hath the sovereign power to be judge, or constitute all judges of opinions and doctrines, as a thing necessary to peace; thereby to prevent discord and civil war.

10 Seventhly, is annexed to the sovereignty the whole power of prescribing the rules whereby every man may know what goods he may enjoy, and what actions he may do, without being molested by any of his fellow subjects: and this is it men call propriety. For before constitution of sovereign power, as hath already been shown, all men had right to all things, which necessarily causeth war: and therefore this propriety, being necessary to peace, and depending on sovereign power, is the act of that power, in order to the public peace. These rules of propriety (or *meum* and *tuum*) and of good, evil, lawful, and unlawful in the actions of subjects are the civil laws; that is to say, the laws of each Commonwealth in particular; though the name of civil law be now restrained to the ancient civil laws of the city of Rome; which being the head of a great part of the world, her laws at that time were in these parts the civil law.

11 Eighthly, is annexed to the sovereignty the right of judicature; that is to say, of hearing and deciding all controversies which may arise concerning law, either civil or natural, or concerning fact. For without the decision of controversies, there is no protection of one subject against the injuries of another; the laws concerning *meum* and *tuum* are in vain, and to every man remaineth, from the natural and necessary appetite of his own conservation, the right of protecting himself by his private strength, which is the condition of war, and contrary to the end for which every Commonwealth is instituted.

12 Ninthly, is annexed to the sovereignty the right of making war and peace with other nations and Commonwealths; that is to say, of judging when it is for the public good, and how great forces are to be assembled, armed, and paid for that end, and to levy money upon the subjects to defray the expenses thereof. For the power by which the people are to be defended consisteth in their armies, and

the strength of an army in the union of their strength under one command; which command the sovereign instituted, therefore hath, because the command of the militia, without other institution, maketh him that hath it sovereign. And therefore, whosoever is made general of an army, he that hath the sovereign power is always generalissimo.

13 Tenthly, is annexed to the sovereignty the choosing of all counsellors, ministers, magistrates, and officers, both in peace and war. For seeing the sovereign is charged with the end, which is the common peace and defence, he is understood to have power to use such means as he shall think most fit for his discharge.

14 Eleventhly, to the sovereign is committed the power of rewarding with riches or honour; and of punishing with corporal or pecuniary punishment, or with ignominy, every subject according to the law he hath formerly made; or if there be no law made, according as he shall judge most to conduce to the encouraging of men to serve the Commonwealth, or deterring of them from doing disservice to the same.

15 Lastly, considering what values men are naturally apt to set upon themselves, what respect they look for from others, and how little they value other men; from whence continually arise amongst them, emulation, quarrels, factions, and at last war, to the destroying of one another, and diminution of their strength against a common enemy; it is necessary that there be laws of honour, and a public rate of the worth of such men as have deserved or are able to deserve well of the Commonwealth, and that there be force in the hands of some or other to put those laws in execution. But it hath already been shown that not only the whole militia, or forces of the Commonwealth, but also the judicature of all controversies, is annexed to the sovereignty. To the sovereign therefore it belonged also to give titles of honour, and to appoint what order of place and dignity each man shall hold, and what signs of respect in public or private meetings they shall give to one another.

16 These are the rights which make the essence of sovereignty, and which are the marks whereby a man may discern in what man, or assembly of men, the sovereign power is placed and resideth. For these are incommunicable and inseparable. The power to coin money, to dispose of the estate and persons of infant heirs, to have pre-emption in markets, and all other statute prerogatives may be transferred by the sovereign, and yet the power to protect his subjects be retained. But if he transfer the militia, he retains the judicature in vain, for want of execution of the laws; or if he grant away the power of raising money, the militia is in vain; or if he give away the government of doctrines, men will be frighted into rebellion with the fear of spirits. And so if we consider any one of the said rights, we shall presently see that the holding of all the rest will produce no effect in the conservation of peace and justice, the end for which all Commonwealths are instituted. And this division is it whereof it is said, a

kingdom divided in itself cannot stand: for unless this division precede, division into opposite armies can never happen. If there had not first been an opinion received of the greatest part of England that these powers were divided between the King and the Lords and the House of Commons, the people had never been divided and fallen into this Civil War; first between those that disagreed in politics, and after between the dissenters about the liberty of religion, which have so instructed men in this point of sovereign right that there be few now in England that do not see that these rights are inseparable, and will be so generally acknowledged at the next return of peace; and so continue, till their miseries are forgotten, and no longer, except the vulgar be better taught than they have hitherto been.

17 And because they are essential and inseparable rights, it follows necessarily that in whatsoever words any of them seem to be granted away, yet if the sovereign power itself be not in direct terms renounced and the name of sovereign no more given by the grantees to him that grants them, the grant is void: for when he has granted all he can, if we grant back the sovereignty, all is restored, as inseparably annexed thereunto.

18 This great authority being indivisible, and inseparably annexed to the sovereignty, there is little ground for the opinion of them that say of sovereign kings, though they be *singulis majores*, of greater power than every one of their subjects, yet they be *universis minores*, of less power than them all together. For if by all together, they mean not the collective body as one person, then all together and every one signify the same; and the speech is absurd. But if by all together, they understand them as one person (which person the sovereign bears), then the power of all together is the same with the sovereign's power; and so again the speech is absurd: which absurdity they see well enough when the sovereignty is in an assembly of the people; but in a monarch they see it not; and yet the power of sovereignty is the same in whomsoever it be placed.

19 And as the power, so also the honour of the sovereign, ought to be greater than that of any or all the subjects. For in the sovereignty is the fountain of honour. The dignities of lord, earl, duke, and prince are his creatures. As in the presence of the master, the servants are equal, and without any honour at all; so are the subjects, in the presence of the sovereign. And though they shine some more, some less, when they are out of his sight; yet in his presence, they shine no more than the stars in presence of the sun.

20 But a man may here object that the condition of subjects is very miserable, as being obnoxious to the lusts and other irregular passions of him or them that have so unlimited a power in their hands. And commonly they that live under a monarch think it the fault of monarchy; and they that live under the government of democracy, or other sovereign assembly, attribute all the inconvenience to that form of Commonwealth; whereas the power in all forms, if they be perfect enough to protect them, is the same: not considering that the estate of man can

never be without some incommodity or other; and that the greatest that in any form of government can possibly happen to the people in general is scarce sensible, in respect of the miseries and horrible calamities that accompany a civil war, or that dissolute condition of masterless men without subjection to laws and a coercive power to tie their hands from rapine and revenge: nor considering that the greatest pressure of sovereign governors proceedeth, not from any delight or profit they can expect in the damage weakening of their subjects, in whose vigour consisteth their own strength and glory, but in the restiveness of themselves that, unwillingly contributing to their own defence, make it necessary for their governors to draw from them what they can in time of peace that they may have means on any emergent occasion, or sudden need, to resist or take advantage on their enemies. For all men are by nature provided of notable multiplying glasses (that is their passions and selflove) through which every little payment appeareth a great grievance, but are destitute of those prospective glasses (namely moral and civil science) to see afar off the miseries that hang over them and cannot without such payments be avoided.

F.A. Hayek, “The Use of Knowledge in Society”

I

What is the problem we wish to solve when we try to construct a rational economic order?

On certain familiar assumptions the answer is simple enough. *If* we possess all the relevant information, *if* we can start out from a given system of preferences and *if* we command complete knowledge of available means, the problem which remains is purely one of logic. That is, the answer to the question of what is the best use of the available means is implicit in our assumptions. The conditions which the solution of this optimum problem must satisfy have been fully worked out and can be stated best in mathematical form: put at their briefest, they are that the marginal rates of substitution between any two commodities or factors must be the same in all their different uses.

This, however, is emphatically not the economic problem which society faces. And the economic calculus which we have developed to solve this logical problem, though an important step toward the solution of the economic problem of society, does not yet provide an answer to it. The reason for this is that the "data" from which the economic calculus starts are never for the whole society "given" to a single mind which could work out the implications, and can never be so given.

The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate "given" resources—if "given" is taken to mean given to a single mind which deliberately solves the problem set by these "data." It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality.

This character of the fundamental problem has, I am afraid, been rather obscured than illuminated by many of the recent refinements of economic theory, particularly by many of the uses made of mathe-matics. Though the problem with which I want primarily to deal in this paper is the problem of a rational economic organization, I shall in its course be led again and again to point to its close connections with certain methodological questions. Many of the points I wish to make are indeed conclusions toward which diverse paths of reasoning have unexpectedly converged. But as I now see these problems, this is no accident. It seems to me that many of the current disputes with regard to both economic theory and economic policy have their common origin in a misconception about the nature of the economic problem of society. This misconception

in turn is due to an erroneous transfer to social phenomena of the habits of thought we have developed in dealing with the phenomena of nature.

II

In ordinary language we describe by the word "planning" the complex of interrelated decisions about the allocation of our available resources. All economic activity is in this sense planning; and in any society in which many people collaborate, this planning, whoever does it, will in some measure have to be based on knowledge which, in the first instance, is not given to the planner but to somebody else, which somehow will have to be conveyed to the planner. The various ways in which the knowledge on which people base their plans is communicated to them is the crucial problem for any theory explaining the economic process. And the problem of what is the best way of utilizing knowledge initially dispersed among all the people is at least one of the main problems of economic policy-or of designing an efficient economic system.

The answer to this question is closely connected with that other question which arises here, that of *who* is to do the planning. It is about this question that all the dispute about "economic planning" centers. This is not a dispute about whether planning is to be done or not. It is a dispute as to whether planning is to be done centrally, by one authority for the whole economic system, or is to be divided among many individuals. Planning in the specific sense in which the term is used in contemporary controversy necessarily means central planning-direction of the whole economic system according to one unified plan. Competition, on the other hand, means decentralized planning by many separate persons. The half-way house between the two, about which many people talk but which few like when they see it, is the delegation of planning to organized industries, or, in other words, monopoly.

Which of these systems is likely to be more efficient depends mainly on the question under which of them we can expect that fuller use will be made of the existing knowledge. And this, in turn, depends on whether we are more likely to succeed in putting at the disposal of a single central authority all the knowledge which ought to be used but which is initially dispersed among many different individuals, or in conveying to the individuals such additional knowledge as they need in order to enable them to fit their plans in with those of others.

III

It will at once be evident that on this point the position will be different with respect to different kinds of knowledge; and the answer to our question will therefore largely turn on the relative importance of the different kinds of knowledge; those more likely to be at the disposal of particular individuals and those which we should with greater confidence expect to find in the possession of an authority made up of suitably chosen experts. If it is today so widely assumed that the latter will be in a better position, this is

because one kind of knowledge, namely, scientific knowledge, occupies now so prominent a place in public imagination that we tend to forget that it is not the only kind that is relevant. It may be admitted that, so far as scientific knowledge is concerned, a body of suitably chosen experts may be in the best position to command all the best knowledge available-though this is of course merely shifting the difficulty to the problem of selecting the experts. What I wish to point out is that, even assuming that this problem can be readily solved, it is only a small part of the wider problem.

Today it is almost heresy to suggest that scientific knowledge is not the sum of all knowledge. But a little reflection will show that there is beyond question a body of very important but unorganized knowledge which cannot possibly be called scientific in the sense of knowledge of general rules: the knowledge of the particular circumstances of time and place. It is with respect to this that practically every individual has some advantage over all others in that he possesses unique information of which beneficial use might be made, but of which use can be made only if the decisions depending on it are left to him or are made with his active coöperation. We need to remember only how much we have to learn in any occupation after we have completed our theoretical training, how big a part of our working life we spend learning particular jobs, and how valuable an asset in all walks of life is knowledge of people, of local conditions, and special circumstances. To know of and put to use a machine not fully employed, or somebody's skill which could be better utilized, or to be aware of a surplus stock which can be drawn upon during an interruption of supplies, is socially quite as useful as the knowledge of better alternative techniques. And the shipper who earns his living from using otherwise empty or half-filled journeys of tramp-steamers, or the estate agent whose whole knowledge is almost exclusively one of temporary opportunities, or the *arbitrageur* who gains from local differences of commodity prices, are all performing eminently useful functions based on special knowledge of circumstances of the fleeting moment not known to others.

It is a curious fact that this sort of knowledge should today be generally regarded with a kind of contempt, and that anyone who by such knowledge gains an advantage over somebody better equipped with theoretical or technical knowledge is thought to have acted almost disreputably. To gain an advantage from better knowledge of facilities of communication or transport is sometimes regarded as almost dis-honest, although it is quite as important that society make use of the best opportunities in this respect as in using the latest scientific discoveries. This prejudice has in a considerable measure affected the attitude toward commerce in general compared with that toward production. Even economists who regard themselves as definitely above the crude materialist fallacies of the past constantly commit the same mistake where activities directed toward the acquisition of such practical knowledge are concerned—apparently because in their scheme of things all such knowledge is supposed to be "given." The common idea now seems to be that all such knowledge should as a matter of course be readily at the command of everybody, and the reproach of irrationality leveled against the existing economic order is frequently based on the fact that it is not so available. This

view disregards the fact that the method by which such knowledge can be made as widely available as possible is precisely the problem to which we have to find an answer.

IV

If it is fashionable today to minimize the importance of the knowledge of the particular circumstances of time and place, this is closely connected with the smaller importance which is now attached to change as such. Indeed, there are few points on which the assumptions made (usually only implicitly) by the "planners" differ from those of their opponents as much as with regard to the significance and frequency of changes which will make substantial alterations of production plans necessary. Of course, if detailed economic plans could be laid down for fairly long periods in advance and then closely adhered to, so that no further economic decisions of importance would be required, the task of drawing up a comprehensive plan governing all economic activity would appear much less formidable.

It is, perhaps, worth stressing that economic problems arise always and only in consequence of change. So long as things continue as before, or at least as they were expected to, there arise no new problems requiring a decision, no need to form a new plan. The belief that changes, or at least day-to-day adjustments, have become less important in modern times implies the contention that economic problems also have become less important. This belief in the decreasing importance of change is, for that reason, usually held by the same people who argue that the importance of economic considerations has been driven into the background by the growing importance of technological knowledge.

Is it true that, with the elaborate apparatus of modern production, economic decisions are required only at long intervals, as when a new factory is to be erected or a new process to be introduced? Is it true that, once a plant has been built, the rest is all more or less mechanical, determined by the character of the plant, and leaving little to be changed in adapting to the ever-changing circumstances of the moment?

The fairly widespread belief in the affirmative is not, so far as I can ascertain, borne out by the practical experience of the business man. In a competitive industry at any rate-and such an industry alone can serve as a test—the task of keeping cost from rising requires constant struggle, absorbing a great part of the energy of the manager. How easy it is for an inefficient manager to dissipate the differentials on which profitability rests, and that it is possible, with the same technical facilities, to produce with a great variety of costs, are among the commonplaces of business experience which do not seem to be equally familiar in the study of the economist. The very strength of the desire, constantly voiced by producers and engineers, to be able to proceed untrammeled by considerations of money costs, is eloquent testimony to the extent to which these factors enter into their daily work.

One reason why economists are increasingly apt to forget about the constant small changes which make up the whole economic picture is probably their growing preoccupation with statistical aggregates, which show a very much greater stability than the movements of the detail. The comparative stability of the aggregates cannot, however, be accounted for—as the statisticians seem occasionally to be inclined to do—by the "law of large numbers" or the mutual compensation of random changes. The number of elements with which we have to deal is not large enough for such accidental forces to produce stability. The continuous flow of goods and services is maintained by constant deliberate adjustments, by new dispositions made every day in the light of circumstances not known the day before, by B stepping in at once when A fails to deliver. Even the large and highly mechanized plant keeps going largely because of an environment upon which it can draw for all sorts of unexpected needs; tiles for its roof, stationery for its forms, and all the thousand and one kinds of equipment in which it cannot be self-contained and which the plans for the operation of the plant require to be readily available in the market.

This is, perhaps, also the point where I should briefly mention the fact that the sort of knowledge with which I have been concerned is knowledge of the kind which by its nature cannot enter into statistics and therefore cannot be conveyed to any central authority in statistical form. The statistics which such a central authority would have to use would have to be arrived at precisely by abstracting from minor differences between the things, by lumping together, as resources of one kind, items which differ as regards location, quality, and other particu-lars, in a way which may be very significant for the specific decision. It follows from this that central planning based on statistical information by its nature cannot take direct account of these circumstances of time and place, and that the central planner will have to find some way or other in which the decisions depending on them can be left to the "man on the spot."

V

If we can agree that the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes and of the resources immediately available to meet them. We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating *all* knowledge, issues its orders. We must solve it by some form of decentralization. But this answers only part of our problem. We need decentralization because only thus can we ensure that the knowledge of the particular circumstances of time and place will be promptly used. But the "man on the spot cannot decide solely on the basis of his limited but intimate knowledge of the facts of his immediate surroundings. There still remains the problem of communicating to him such further information as he needs to fit his decisions into the whole pattern of changes of the larger economic system.

How much knowledge does he need to do so successfully? Which of the events which happen beyond the horizon of his immediate knowledge are of relevance to his immediate decision, and how much of them need he know?

There is hardly anything that happens anywhere in the world that *might* not have an effect on the decision he ought to make. But he need not know of these events as such, nor of *all* their effects. It does not matter for him *why* at the particular moment more screws of one size than of another are wanted, *why* paper bags are more readily available than canvas bags, or *why* skilled labor, or particular machine tools, have for the moment become more difficult to acquire. All that is significant for him is *how much more or less* difficult to procure they have become compared with other things with which he is also con-cerned, or how much more or less urgently wanted are the alternative things he produces or uses. It is always a question of the relative importance of the particular things with which he is concerned, and the causes which alter their relative importance are of no interest to him beyond the effect on those concrete things of his own environment.

It is in this connection that what I have called the economic calculus proper helps us, at least by analogy, to see how this problem can be solved, and in fact is being solved, by the price system. Even the single controlling mind, in possession of all the data for some small, self-contained economic system, would not—every time some small adjustment in the allocation of resources had to be made—go explicitly through all the relations between ends and means which might possibly be affected. It is indeed the great contribution of the pure logic of choice that it has demonstrated conclusively that even such a single mind could solve this kind of problem only by constructing and constantly using rates of equivalence (or "values," or "marginal rates of substitution"), *i.e.*, by attaching to each kind of scarce resource a numerical index which cannot be derived from any property possessed by that particular thing, but which reflects, or in which is condensed, its significance in view of the whole means-end structure. In any small change he will have to consider only these quantitative indices (or "values") in which all the relevant information is concentrated; and by adjusting the quantities one by one, he can appropriately rearrange his dispositions without having to solve the whole puzzle *ab initio*, or without needing at any stage to survey it at once in all its ramifications.

Fundamentally, in a system where the knowledge of the relevant facts is dispersed among many people, prices can act to coördinate the separate actions of different people in the same way as subjective values help the individual to coördinate the parts of his plan. It is worth contemplating for a moment a very simple and commonplace instance of the action of the price system to see what precisely it accomplishes. Assume that somewhere in the world a new opportunity for the use of some raw material, say tin, has arisen, or that one of the sources of supply of tin has been eliminated. It does not matter for our purpose—and it is very significant that it does not matter—which of these two causes has made tin more scarce. All that the users

of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere, and that in consequence they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favor of what other needs they ought to husband the supply. If only some of them know directly of the new demand, and switch resources over to it, and if the people who are aware of the new gap thus created in turn fill it from still other sources, the effect will rapidly spread throughout the whole economic system and influence not only all the uses of tin, but also those of its substitutes and the substitutes of these substitutes, the supply of all the things made of tin, and their substitutes, and so on; and all this without the great majority of those instrumental in bringing about these substitutions knowing anything at all about the original cause of these changes. The whole acts as one market, not because any of its members survey the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all. The mere fact that there is one price for any commodity—or rather that local prices are connected in a manner determined by the cost of transport, etc.—brings about the solution which (it is just conceptually possible) might have been arrived at by one single mind possessing all the information which is in fact dispersed among all the people involved in the process.

VI

We must look at the price system as such a mechanism for communicating information if we want to understand its real function—a function which, of course, it fulfills less perfectly as prices grow more rigid. (Even when quoted prices have become quite rigid, however, the forces which would operate through changes in price still operate to a considerable extent through changes in the other terms of the contract.) The most significant fact about this system is the economy of knowledge with which it operates, or how little the individual participants need to know in order to be able to take the right action. In abbreviated form, by a kind of symbol, only the most essential information is passed on, and passed on only to those concerned. It is more than a metaphor to describe the price system as a kind of machinery for registering change, or a system of telecommunications which enables individual producers to watch merely the movement of a few pointers, as an engineer might watch the hands of a few dials, in order to adjust their activities to changes of which they may never know more than is reflected in the price movement.

Of course, these adjustments are probably never "perfect" in the sense in which the economist conceives of them in his equilibrium analysis. But I fear that our theoretical habits of approaching the problem with the assumption of more or less perfect knowledge on the part of almost everyone has made us somewhat blind to the true function of the price mechanism and led us to apply rather misleading standards in judging its efficiency. The marvel is that in a case like that of a scarcity of one raw material, without an order being issued, without more than perhaps a handful of people

knowing the cause, tens of thousands of people whose identity could not be ascertained by months of investigation, are made to use the material or its products more sparingly; *i.e.*, they move in the right direction. This is enough of a marvel even if, in a constantly changing world, not all will hit it off so perfectly that their profit rates will always be maintained at the same constant or "normal" level.

I have deliberately used the word "marvel" to shock the reader out of the complacency with which we often take the working of this mechanism for granted. I am convinced that if it were the result of deliberate human design, and if the people guided by the price changes understood that their decisions have significance far beyond their immediate aim, this mechanism would have been acclaimed as one of the greatest triumphs of the human mind. Its misfortune is the double one that it is not the product of human design and that the people guided by it usually do not know why they are made to do what they do. But those who clamor for "conscious direction"—and who cannot believe that anything which has evolved without design (and even without our understanding it) should solve problems which we should not be able to solve consciously—should remember this: The problem is precisely how to extend the span of our utilization of resources beyond the span of the control of any one mind; and, therefore, how to dispense with the need of conscious control and how to provide inducements which will make the individuals do the desirable things without anyone having to tell them what to do.

The problem which we meet here is by no means peculiar to economics but arises in connection with nearly all truly social phenomena, with language and most of our cultural inheritance, and constitutes really the central theoretical problem of all social science. As Alfred Whitehead has said in another connection, "It is a profoundly erroneous truism, repeated by all copy-books and by eminent people when they are making speeches, that we should cultivate the habit of thinking what we are doing. The precise opposite is the case. Civilization advances by extending the number of important operations which we can perform without thinking about them." This is of profound significance in the social field. We make constant use of formulas, symbols and rules whose meaning we do not understand and through the use of which we avail ourselves of the assistance of knowledge which individually we do not possess. We have developed these practices and institutions by building upon habits and institutions which have proved successful in their own sphere and which have in turn become the foundation of the civilization we have built up.

The price system is just one of those formations which man has learned to use (though he is still very far from having learned to make the best use of it) after he had stumbled upon it without understanding it. Through it not only a division of labor but also a coördinated utilization of resources based on an equally divided knowledge has become possible. The people who like to deride any suggestion that this may be so usually distort the argument by insinuating that it asserts that by some miracle just that sort of system has spontaneously grown up which is best suited to modern civilization.

It is the other way round: man has been able to develop that division of labor on which our civilization is based because he happened to stumble upon a method which made it possible. Had he not done so he might still have developed some other, altogether different, type of civilization, something like the "state" of the termite ants, or some other altogether unimaginable type. All that we can say is that nobody has yet succeeded in designing an alternative system in which certain features of the existing one can be preserved which are dear even to those who most violently assail it—such as particularly the extent to which the individual can choose his pursuits and consequently freely use his own knowledge and skill.

VII

It is in many ways fortunate that the dispute about the indispensability of the price system for any rational calculation in a complex society is now no longer conducted entirely between camps holding different political views. The thesis that without the price system we could not preserve a society based on such extensive division of labor as ours was greeted with a howl of derision when it was first advanced by von Mises twenty-five years ago. Today the difficulties which some still find in accepting it are no longer mainly political, and this makes for an atmosphere much more conducive to reasonable discussion. When we find Leon Trotsky arguing that "economic accounting is unthinkable without market relations"; when Professor Oscar Lange promises Professor von Mises a statue in the marble halls of the future Central Planning Board; and when Professor Abba P. Lerner rediscovers Adam Smith and emphasizes that the essential utility of the price system consists in inducing the individual, while seeking his own interest, to do what is in the general interest, the differences can indeed no longer be ascribed to political prejudice. The remaining dissent seems clearly to be due to purely intellectual, and more particularly methodological, differences.

A recent statement by Professor Joseph Schumpeter in his *Capitalism, Socialism and Democracy* provides a clear illustration of one of the methodological differences which I have in mind. Its author is preeminent among those economists who approach economic phenomena in the light of a certain branch of positivism. To him these phenomena accordingly appear as objectively given quantities of commodities impinging directly upon each other, almost, it would seem, without any intervention of human minds. Only against this background can I account for the following (to me startling) pronouncement. Professor Schumpeter argues that the possibility of a rational calculation in the absence of markets for the factors of production follows for the theorist "from the elementary proposition that consumers in evaluating ('demanding') consumers' goods *ipso facto* also evaluate the means of production which enter into the production of these goods."[62]

[62] J. Schumpeter, *Capitalism, Socialism, and Democracy* (New York, Harper, 1942), p. 175. Professor Schumpeter is, I believe, also the original author of the myth that Pareto and Barone have "solved" the problem of socialist calculation. What they, and many others, did was merely to state the conditions

Taken literally, this statement is simply untrue. The consumers do nothing of the kind. What Professor Schumpeter's "*ipso facto*" presumably means is that the valuation of the factors of production is implied in, or follows necessarily from, the valuation of consumers' goods. But this, too, is not correct. Implication is a logical relationship which can be meaningfully asserted only of propositions simultaneously present to one and the same mind. It is evident, however, that the values of the factors of production do not depend solely on the valuation of the consumers' goods but also on the conditions of supply of the various factors of production. Only to a mind to which all these facts were simultaneously known would the answer necessarily follow from the facts given to it. The practical problem, however, arises precisely because these facts are never so given to a single mind, and because, in consequence, it is necessary that in the solution of the problem knowledge should be used that is dispersed among many people.

The problem is thus in no way solved if we can show that all the facts, *if* they were known to a single mind (as we hypothetically assume them to be given to the observing economist), would uniquely determine the solution; instead we must show how a solution is produced by the interactions of people each of whom possesses only partial knowledge. To assume all the knowledge to be given to a single mind in the same manner in which we assume it to be given to us as the explaining economists is to assume the problem away and to disregard everything that is important and significant in the real world.

That an economist of Professor Schumpeter's standing should thus have fallen into a trap which the ambiguity of the term "datum" sets to the unwary can hardly be explained as a simple error. It suggests rather than there is something fundamentally wrong with an approach which habitually disregards an essential part of the phenomena with which we have to deal: the unavoidable imperfection of man's knowledge and the consequent need for a process by which knowledge is constantly communicated and acquired. Any approach, such as that of much of mathematical economics with its simultaneous equations, which in effect starts from the assumption that people's *knowledge* corresponds with the objective *facts* of the situation, systematically leaves out what is our main task to explain. I am far from denying that in our system equilibrium analysis has a useful function to per-form. But when it comes to the point where it misleads some of our leading thinkers into believing that the situation which it describes has direct relevance to the solution of practical problems, it is time that we remember that it does not deal with the social process at all and that it is no more than a useful preliminary to the study of the main problem.

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which a rational allocation of resources would have to satisfy, and to point out that these were essentially the same as the conditions of equilibrium of a competitive market. This is something altogether different from showing how the allocation of resources satisfying these conditions can be found in prac-tice. Pareto himself (from whom Barone has taken practically everything he has to say), far from claiming to have solved the practical problem, in fact explicitly denies that it can be solved without the help of the market. See his *Manuel d'économie pure* (2nd ed., 1927), pp. 233-34. The relevant passage is quoted in an English translation at the beginning of my article on "Socialist Calculation: The Competitive 'Solution,' in *Economica*, New Series, Vol. VIII, No. 26 (May, 1940), p. 125.

J.D. Davidson and W. Rees-Mogg, *The Sovereign Individual*

Chapter 1: The Transition of the Year 2000

"It feels like something big is about to happen: graphs show us the yearly growth of populations, atmospheric concentrations of carbon dioxide, Net addresses, and Mbytes per dollar. They all soar up to an asymptote just beyond the turn of the century: The Singularity. The end of everything we know. The beginning of something we may never understand."

– DANNY HILLIS

Premonitions

The coming of the year 2000 has haunted the Western imagination for the past thousand years. Ever since the world failed to end at the turn of the first millennium after Christ, theologians, evangelists, poets, seers, and now, even computer programmers have looked to the end of this decade with an expectation that it would bring something momentous. No less an authority than Isaac Newton speculated that the world would end with the year 2000. Michel de Nostradamus, whose prophecies have been read by every generation since they were first published in 1568, forecast the coming of the Third Antichrist in July 1999. Swiss psychologist Carl Jung, connoisseur of the "collective unconscious," envisioned the birth of a New Age in 1997. Such forecasts may easily be ridiculed. And so can the sober forecasts of economists, such as Dr. Edward Yardeni of Deutsche Bank Securities, who expects computer malfunctions on the millennial midnight to "disrupt the entire global economy." But whether you view the Y2K computer problem as groundless hysteria ginned up by computer programmers and Information Technology consultants to stir up business, or as a mysterious instance of technology unfolding in concert with the prophetic imagination, there is no denying that circumstances at the eve of the millennium excite more than the usual morbid doubt about where the world is tending.

A sense of disquiet about the future has begun to color the optimism so characteristic of Western societies for the past 250 years. People everywhere are hesitant and worried. You see it in their faces. Hear it in their conversation. See it reflected in polls and registered in the ballot box. Just as an invisible, physical change of ions in the atmosphere signals that a thunderstorm is imminent even before the clouds darken and lightning strikes, so now, in the twilight of the millennium, premonitions of change are in the air. One person after another, each in his own way, senses that time is running out on a dying way of life. As the decade expires, a murderous century expires with it, and also a glorious millennium of human accomplishment. All draw to a close with the year 2000.

"For there is nothing covered that shall not be revealed, neither hid that shall not be known."
– MATTHEW 10:26

We believe that the modern phase of Western civilization will end with it. This book tells why. Like many earlier works, it is an attempt to see into a glass darkly, to sketch out the vague shapes and dimensions of a future that is still to be. In that sense, we mean our work to be apocalyptic—in the original meaning of the word. *Apokalypsis* means "unveiling" in Greek. We believe that a new stage in history—the Information Age—is about to be "unveiled."

"We are watching the beginnings of a new logical space, an instantaneous electronic everywhereness, which we may all access, enter into, and experience. We have, in short, the beginnings of a new kind of community. The virtual community becomes the model for a secular Kingdom of Heaven; as Jesus said there were many mansions in his Father's Kingdom, so there are many virtual communities, each reflecting their own needs and desires."
– MICHAEL GRASSO

The Fourth Stage of Human Society

The theme of this book is the new revolution of power which is liberating individuals at the expense of the twentieth-century nation-state. Innovations that alter the logic of violence in unprecedented ways are transforming the boundaries within which the future must lie. If our deductions are correct, you stand at the threshold of the most sweeping revolution in history. Faster than all but a few now imagine, microprocessing will subvert and destroy the nation-state, creating new forms of social organization in the process. This will be far from an easy transformation.

The challenge it will pose will be all the greater because it will happen with incredible speed compared with anything seen in the past. Through all of human history from its earliest beginnings until now, there have been only three basic stages of economic life: (1) hunting-and-gathering societies; (2) agricultural societies; and (3) industrial societies. Now, looming over the horizon, is something entirely new, the fourth stage of social organization: information societies.

Each of the previous stages of society has corresponded with distinctly different phases in the evolution and control of violence. As we explain in detail, information societies promise to dramatically reduce the returns to violence, in part because they transcend locality. The virtual reality of cyberspace, what novelist William Gibson characterized as a "consensual hallucination," will be as far beyond the reach of bullies as imagination can take it. In the new millennium, the advantage of controlling violence

on a large scale will be far lower than it has been at any time since before the French Revolution. This will have profound consequences. One of these will be rising crime. When the payoff for organizing violence at a large scale tumbles, the payoff from violence at a smaller scale is likely to jump. Violence will become more random and localized. Organized crime will grow in scope. We explain why.

Another logical implication of falling returns to violence is the eclipse of politics, which is the stage for crime on the largest scale. There is much evidence that adherence to the civic myths of the twentieth-century nation-state is rapidly eroding. The death of Communism is merely the most striking example. As we explore in detail, the collapse of morality and growing corruption among leaders of Western governments are not random developments. They are evidence that the potential of the nation-state is exhausted. Even many of its leaders no longer believe the platitudes they mouth. Nor are they believed by others.

History Repeats Itself

This is a situation with striking parallels in the past. Whenever technological change has divorced the old forms from the new moving forces of the economy, moral standards shift, and people begin to treat those in command of the old institutions with growing disdain. This widespread revulsion often comes into evidence well before people develop a new coherent ideology of change. So it was in the late fifteenth century, when the medieval Church was the predominant institution of feudalism. Notwithstanding popular belief in "the sacredness of the sacerdotal office," both the higher and lower ranks of clergy were held in the utmost contempt—not unlike the popular attitude toward politicians and bureaucrats today.

We believe that much can be learned by analogy between the situation at the end of the fifteenth century, when life had become thoroughly saturated by organized religion, and the situation today, when the world has become saturated with politics. The costs of supporting institutionalized religion at the end of the fifteenth century had reached a historic extreme, much as the costs of supporting government have reached a senile extreme today.

We know what happened to organized religion in the wake of the Gunpowder Revolution. Technological developments created strong incentives to downsize religious institutions and lower their costs. A similar technological revolution is destined to downsize radically the nation-state early in the new millennium.

"Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned"

—MARSHALL McLUHAN, 1964

The Information Revolution

As the breakdown of large systems accelerates, systematic compulsion will recede as a factor shaping economic life and the distribution of income. Efficiency will become more important than the dictates of power in the organization of social institutions. This means that provinces and even cities that can effectively uphold property rights and provide for the administration of justice, while consuming few resources, will be viable sovereignties in the Information Age, as they generally have not been during the last five centuries. An entirely new realm of economic activity that is not hostage to physical violence will emerge in cyberspace. The most obvious benefits will flow to the "cognitive elite," who will increasingly operate outside political boundaries. They are already equally at home in Frankfurt, London, New York, Buenos Aires, Los Angeles, Tokyo, and Hong Kong. Incomes will become more unequal within jurisdictions and more equal between them.

The Sovereign Individual explores the social and financial consequences of this revolutionary change. Our desire is to help you to take advantage of the opportunities of the new age and avoid being destroyed by its impact. If only half of what we expect to see happens, you face change of a magnitude with few precedents in history.

The transformation of the year 2000 will not only revolutionize the character of the world economy, it will do so more rapidly than any previous phase change. Unlike the Agricultural Revolution, the Information Revolution will not take millennia to do its work. Unlike the Industrial Revolution, its impact will not be spread over centuries. The Information Revolution will happen within a lifetime.

What is more, it will happen almost everywhere at once. Technical and economic innovations will no longer be confined to small portions of the globe. The transformation will be all but universal. And it will involve a break with the past so profound that it will almost bring to life the magical domain of the gods as imagined by the early agricultural peoples like the ancient Greeks. To a greater degree than most would now be willing to concede, it will prove difficult or impossible to preserve many contemporary institutions in the new millennium. When information societies take shape they will be as different from industrial societies as the Greece of Aeschylus was from the world of the cave dwellers.

Prometheus Unbound: The Rise of the Sovereign Individual

"I know of no more encouraging fact than the unquestionable ability of man to elevate his life by conscious endeavor."

– HENRY DAVID THOREAU

The coming transformation is both good news and bad. The good news is that the Information Revolution will liberate individuals as never before. For the first time, those who can educate and motivate themselves will be almost entirely free to invent their own work and realize the full benefits of their own productivity. Genius will be unleashed, freed from both the oppression of government and the drags of racial and ethnic prejudice. In the Information Society, no one who is truly able will be detained by the ill-formed opinions of others. It will not matter what most of the people on earth might think of your race, your looks, your age, your sexual proclivities, or the way you wear your hair. In the cybereconomy, they will never see you. The ugly, the fat, the old, the disabled will vie with the young and beautiful on equal terms in utterly color-blind anonymity on the new frontiers of cyberspace.

Ideas Become Wealth

Merit, wherever it arises, will be rewarded as never before. In an environment where the greatest source of wealth will be the ideas you have in your head rather than physical capital alone, anyone who thinks clearly will potentially be rich. The Information Age will be the age of upward mobility. It will afford far more equal opportunity for the billions of humans in parts of the world that never shared fully in the prosperity of industrial society. The brightest, most successful and ambitious of these will emerge as truly Sovereign Individuals.

At first, only a handful will achieve full financial sovereignty. But this does not negate the advantages of financial independence. The fact that not everyone attains an equally vast fortune does not mean that it is futile or meaningless to become rich. There are 25,000 millionaires for every billionaire. If you are a millionaire and not a billionaire, that does not make you poor. Equally, in the future, one of the milestones by which you measure your financial success will be not just how many zeroes you can add to your net worth, but whether you can structure your affairs in a way that enables you to realize full individual autonomy and independence. The more clever you are, the less propulsion you will require to achieve financial escape velocity. Persons of even quite modest means will soar, as the gravitational pull of politics on the global economy weakens. Unprecedented financial independence will be a reachable goal in your lifetime or that of your children.

At the highest plateau of productivity, these Sovereign Individuals will compete and interact on terms that echo the relations among the gods in Greek myth. The elusive Mount Olympus of the next millennium will be in cyberspace—a realm without physical existence that will nonetheless develop what promises to be the world's largest economy by the second decade of the new millennium. By 2025, the cybereconomy will have many millions of participants. Some of them will be as rich as Bill Gates, worth tens of billions of dollars each. The cyberpoor may be those with an income of less than $200,000 a year. There will be no cyberwelfare. No cybertaxes and no cybergovernment.

The cybereconomy, rather than China, could well be the greatest economic phenomenon of the next thirty years.

The good news is that politicians will no more be able to dominate, suppress, and regulate the greater part of commerce in this new realm than the legislators of the ancient Greek city-states could have trimmed the beard of Zeus. That is good news for the rich. And even better news for the not so rich. The obstacles and burdens that politics imposes are more obstacles to becoming rich than to being rich. The benefits of declining returns to violence and devolving jurisdictions will create scope for every energetic and ambitious person to benefit from the death of politics. Even the consumers of government services will benefit as entrepreneurs extend the benefits of competition. Heretofore, competition between jurisdictions has usually meant competition by means of violence to enforce the rule of a predominant group. Consequently, much of the ingenuity of interjurisdictional competition was channeled into military endeavor. But the advent of the cybereconomy will bring competition on new terms to provision of sovereignty services. A proliferation of jurisdictions will mean proliferating experimentation in new ways of enforcing contracts and otherwise securing the safety of persons and property. The liberation of a large part of the global economy from political control will oblige whatever remains of government as we have known it to operate on more nearly market terms. Governments will ultimately have little choice but to treat populations in territories they serve more like customers, and less in the way that organized criminals treat the victims of a shakedown racket.

Beyond Politics

What mythology described as the province of the gods will become a viable option for the individual—a life outside the reach of kings and councils. First in scores, then in hundreds, and ultimately in the millions, individuals will escape the shackles of politics. As they do, they will transform the character of governments, shrinking the realm of compulsion and widening the scope of private control over resources.

The emergence of the sovereign individual will demonstrate yet again the strange prophetic power of myth. Conceiving little of the laws of nature, the early agricultural peoples imagined that "powers we should call supernatural" were widely distributed. These powers were sometimes employed by men, sometimes by "incarnate human gods" who looked like men and interacted with them in what Sir James George Frazer described in *The Golden Bough* as "a great democracy."

When the ancients imagined the children of Zeus living among them they were inspired by a deep belief in magic. They shared with other primitive agricultural peoples an awe of nature, and a superstitious conviction that nature's works were set in motion by individual volition, by magic. In that sense, there was nothing self-consciously prophetic about their view of nature and their gods. They were far from anticipating microtechnology. They could not have imagined its impact in altering the marginal productivity of individuals thousands of years later. They certainly could not have

foreseen how it would shift the balance between power and efficiency and thus revolutionize the way that assets are created and protected. Yet what they imagined as they spun their myths has a strange resonance with the world you are likely to see.

Alt. Abracadabra

The "abracadabra" of the magic invocation, for example, bears a curious similarity to the password employed to access a computer. In some respects, high-speed computation has already made it possible to mimic the magic of the genie. Early generations of "digital servants" already obey the commands of those who control the computers in which they are sealed much as genies were sealed in magic lamps. The virtual reality of information technology will widen the realm of human wishes to make almost anything that can be imagined seem real. Telepresence will give living individuals the same capacity to span distance at supernatural speed and monitor events from afar that the Greeks supposed was enjoyed by Hermes and Apollo. The Sovereign Individuals of the Information Age, like the gods of ancient and primitive myths, will in due course enjoy a kind of "diplomatic immunity" from most of the political woes that have beset mortal human beings in most times and places.

The new Sovereign Individual will operate like the gods of myth in the same physical environment as the ordinary, subject citizen, but in a separate realm politically. Commanding vastly greater resources and beyond the reach of many forms of compulsion, the Sovereign Individual will redesign governments and reconfigure economies in the new millennium. The full implications of this change are all but unimaginable.

Genius and Nemesis

For anyone who loves human aspiration and success, the Information Age will provide a bounty. That is surely the best news in many generations. But it is bad news as well. The new organization of society implied by the triumph of individual autonomy and the true equalization of opportunity based upon merit will lead to very great rewards for merit and great individual autonomy. This will leave individuals far more responsible for themselves than they have been accustomed to being during the industrial period. It will also precipitate transition crises, including a possibly severe economic depression that will reduce the unearned advantage in living standards that has been enjoyed by residents of advanced industrial societies throughout the twentieth century. As we write, the top 15 percent of the world's population have an average per-capita income of $21,000 annually. The remaining 85 percent of the world have an average income of just $1,000. That huge, hoarded advantage from the past is bound to dissipate under the new conditions of the Information Age.

As it does, the capacity of nation-states to redistribute income on a large scale will collapse. Information technology facilitates dramatically increased competition

between jurisdictions. When technology is mobile, and transactions occur in cyberspace, as they increasingly will do, governments will no longer be able to charge more for their services than they are worth to the people who pay for them. Anyone with a portable computer and a satellite link will be able to conduct almost any information business anywhere, and that includes almost the whole of the world's multitrillion-dollar financial transactions.

This means that you will no longer be obliged to live in a high-tax jurisdiction in order to earn high income. In the future, when most wealth can be earned anywhere, and even spent anywhere, governments that attempt to charge too much as the price of domicile will merely drive away their best customers. If our reasoning is correct, and we believe it is, the nation-state as we know it will not endure in anything like its present form.

The End of Nations

Changes that diminish the power of predominant institutions are both unsettling and dangerous. Just as monarchs, lords, popes, and potentates fought ruthlessly to preserve their accustomed privileges in the early stages of the modern period, so today's governments will employ violence, often of a covert and arbitrary kind, in the attempt to hold back the clock. Weakened by the challenge from technology, the state will treat increasingly autonomous individuals, its former citizens, with the same range of ruthlessness and diplomacy it has heretofore displayed in its dealing with other governments. The advent of this new stage in history was punctuated with a bang on August 20, 1998, when the United States fired about $200 million worth of Tomahawk BGM-109 sea-launched cruise missiles at targets allegedly associated with an exiled Saudi millionaire, Osama bin Laden. Bin Laden became the first person in history to have his satellite phone targeted for attack by cruise missiles. Simultaneously, the United States destroyed a pharmaceutical plant in Khartoum, Sudan, in Bin Laden's honor. The emergence of Bin Laden as the enemy-in-chief of the United States reflects a momentous change in the nature of warfare. A single individual, albeit one with hundreds of millions of dollars, can now be depicted as a plausible threat to the greatest military power of the Industrial era. In statements reminiscent of propaganda employed during the Cold War about the Soviet Union, the United States president and his national security aides portrayed Bin Laden, a private individual, as a transnational terrorist and leading enemy of the United States.

The same military logic that has seen Osama bin Laden elevated to a position as the chief enemy of the United States will assert itself in governments' internal relations with their subjects. Increasingly harsh techniques of exaction will be a logical corollary of the emergence of a new type of bargaining between governments and individuals. Technology will make individuals more nearly sovereign than ever before. And they will be treated that way. Sometimes violently, as enemies, sometimes as equal parties in negotiation, sometimes as allies. But however ruthlessly governments behave,

particularly in the transition period, wedding the IRS with the CIA will avail them little. They will be increasingly required by the press of necessity to bargain with autonomous individuals whose resources will no longer be so easily controlled.

The changes implied by the Information Revolution will not only create a fiscal crisis for governments, they will tend to disintegrate all large structures. Fourteen empires have disappeared already in the twentieth century. The breakdown of empires is part of a process that will dissolve the nation-state itself. Government will have to adapt to the growing autonomy of the individual. Taxing capacity will plunge by 50-70 percent. This will tend to make smaller jurisdictions more successful. The challenge of setting competitive terms to attract able individuals and their capital will be more easily undertaken in enclaves than across continents.

We believe that as the modern nation-state decomposes, latter-day barbarians will increasingly come to exercise power behind the scenes. Groups like the Russian mafiya, which picks the bones of the former Soviet Union, other ethnic criminal gangs, nomenklaturas, drug lords, and renegade covert agencies will be laws unto themselves. They already are. Far more than is widely understood, the modern barbarians have already infiltrated the forms of the nation-state without greatly changing its appearances. They are micro-parasites feeding on a dying system. As violent and unscrupulous as a state at war, these groups employ the techniques of the state on a smaller scale. Their growing influence and power are part of the downsizing of politics. Microprocessing reduces the size that groups must attain in order to be effective in the use and control of violence. As this technological revolution unfolds, predatory violence will be organized more and more outside of central control. Efforts to contain violence will also devolve in ways that depend more upon efficiency than magnitude of power.

History in Reverse

The process by which the nation-state grew over the past five centuries will be put into reverse by the new logic of the Information Age. Local centers of power will reassert themselves as the state devolves into fragmented, overlapping sovereignties. The growing power of organized crime is merely one reflection of this tendency. Multinational companies are already having to subcontract all but essential work. Some conglomerates, such as AT&T, Unisys, and ITT, have split themselves into several firms in order to function more profitably. The nation-state will devolve like an unwieldy conglomerate, but probably not before it is forced to do so by financial crises.

Not only is power in the world changing, but the work of the world is changing as well. This means that the way business operates will inevitably change. The "virtual corporation" is evidence of a sweeping transformation in the nature of the firm, facilitated by the drop in information and transaction costs. We explore the implications of the Information Revolution for dissolving corporations and doing away with the "good job." In the Information Age, a "job" will be a task to do, not a position you "have." Microprocessing has created entirely new horizons of economic activity that

transcend territorial boundaries. This transcendence of frontiers and territories is perhaps the most revolutionary development since Adam and Eve straggled out of paradise under the sentence of their Maker: "In the sweat of thy face shalt thou eat bread." As technology revolutionizes the tools we use, it also antiquates our laws, reshapes our morals, and alters our perceptions. This book explains how.

Microprocessing and rapidly improving communications already make it possible for the individual to choose where to work. Transactions on the Internet or the World Wide Web can be encrypted and will soon be almost impossible for tax collectors to capture. Tax-free money already compounds far faster offshore than onshore funds still subject to the high tax burden imposed by the twentieth-century nation-state. After the turn of the millennium, much of the world's commerce will migrate into the new realm of cyberspace, a region where governments will have no more dominion than they exercise over the bottom of the sea or the outer planets. In cyberspace, the threats of physical violence that have been the alpha and omega of politics since time immemorial will vanish. In cyberspace, the meek and the mighty will meet on equal terms. Cyberspace is the ultimate offshore jurisdiction. An economy with no taxes. Bermuda in the sky with diamonds.

When this greatest tax haven of them all is fully open for business, all funds will essentially be offshore funds at the discretion of their owner. This will have cascading consequences. The state has grown used to treating its taxpayers as a farmer treats his cows, keeping them in a field to be milked. Soon, the cows will have wings.

The Revenge of Nations

Like an angry farmer, the state will no doubt take desperate measures at first to tether and hobble its escaping herd. It will employ covert and even violent means to restrict access to liberating technologies. Such expedients will work only temporarily, if at all. The twentieth-century nation-state, with all its pretensions, will starve to death as its tax revenues decline.

When the state finds itself unable to meet its committed expenditure by raising tax revenues, it will resort to other, more desperate measures. Among them is printing money. Governments have grown used to enjoying a monopoly over currency that they could depreciate at will. This arbitrary inflation has been a prominent feature of the monetary policy of all twentieth-century states. Even the best national currency of the postwar period, the German mark, lost 71 percent of its value from January 1, 1949, through the end of June 1995. In the same period, the U.S. dollar lost 84 percent of its value. This inflation had the same effect as a tax on all who hold the currency. As we explore later, inflation as revenue option will be largely foreclosed by the emergence of cybermoney. New technologies will allow the holders of wealth to bypass the national monopolies that have issued and regulated money in the modern period. Indeed, the credit crises that swept through Asia, Russia, and other emerging economies in 1997 and 1998 attest to the fact that national currencies and national credit ratings are

anachronisms inimical to the smooth operation of the global economy. It is precisely the fact that the demands of sovereignty require all transactions within a jurisdiction to be denominated in a national currency that creates the vulnerability to mistakes by central bankers and attacks by speculators which precipitated deflationary crises in one jurisdiction after another. In the Information Age, individuals will be able to use cybercurrencies and thus declare their monetary independence. When individuals can conduct their own monetary policies over the World Wide Web it will matter less or not at all that the state continues to control the industrial-era printing presses. Their importance for controlling the world's wealth will be transcended by mathematical algorithms that have no physical existence. In the new millennium, cybermoney controlled by private markets will supersede fiat money issued by governments. Only the poor will be victims of inflation and ensuing collapses into deflation that are consequences of the artificial leverage which fiat money injects into the economy.

Lacking their accustomed scope to tax and inflate, governments, even in traditionally civil countries, will turn nasty. As income tax becomes uncollectible, older and more arbitrary methods of exaction will resurface. The ultimate form of withholding tax—*de facto* or even overt hostage-taking—will be introduced by governments desperate to prevent wealth from escaping beyond their reach. Unlucky individuals will find themselves singled out and held to ransom in an almost medieval fashion. Businesses that offer services that facilitate the realization of autonomy by individuals will be subject to infiltration, sabotage, and disruption. Arbitrary forfeiture of property, already commonplace in the United States, where it occurs five thousand times a week, will become even more pervasive. Governments will violate human rights, censor the free flow of information, sabotage useful technologies, and worse. For the same reasons that the late, departed Soviet Union tried in vain to suppress access to personal computers and Xerox machines, Western governments will seek to suppress the cybereconomy by totalitarian means.

Return of the Luddites

Such methods may prove popular among some population segments. The good news about individual liberation and autonomy will seem to be bad news to many who are frightened by the transition crisis and do not expect to be winners in the new configuration of society. The apparent popularity of the draconian capital controls imposed in 1998 by Malaysian prime minister Mahathir Mohamad in the wake of the Asian meltdown testifies to residual enthusiasm among many for the old-fashioned closed economy dominated by the nation-state. This nostalgia for the past will be fed by resentments inflamed by the inevitable transition crisis. The greatest resentment is likely to be centered among those of middle talent in currently rich countries. They particularly may come to feel that information technology poses a threat to their way of life. The beneficiaries of organized compulsion, including millions receiving income redistributed by governments, may resent the new freedom realized by Sovereign

Individuals. Their upset will illustrate the truism that "where you stand is determined by where you sit."

"Sometimes I wondered how I could experience such deep misery over the fate of a handful of men I did not know, playing a game against another group of strangers in a ballpark hundreds of miles away. The answer is simple. I loved my teams. Although risky, caring was worth its price. Sports fired up my blood, excited me, made my heart pound. I liked having something at stake. Life was more vivid during a contest."

– CRAIG LAMBERT

It would be misleading, however, to attribute all the bad feelings that will be generated in the coming transition crisis to the bald desire to live at someone else's expense. More will be involved. The very character of human society suggests that there is bound to be a misguided moral dimension to the coming Luddite reaction. Think of it as a bald desire fitted with a moral toupee. We explore the moral and moralistic dimensions of the transition crisis. Self-interested grasping of a conscious kind has far less power to motivate actions than does self-righteous fury. While adherence to the civic myths of the twentieth century is rapidly falling away, they are not without their true believers. Many humans, as the passage quoted from Craig Lambert attests, are belongers, who place importance on being members of a group. The same need to identify that motivates fans of organized sports makes some partisans of nations. Everyone who came of age in the twentieth century has been inculcated in the duties and obligations of the twentieth-century citizen. The residual moral imperatives from industrial society will stimulate at least some neo-Luddite attacks on information technologies.

In this sense, this violence to come will be at least partially an expression of what we call "moral anachronism," the application of moral strictures drawn from one stage of economic life to the circumstances of another. Every stage of society requires its own moral rules to help individuals overcome incentive traps peculiar to the choices they face in that particular way of life. Just as a farming society could not live by the moral rules of a migratory Eskimo band, so the Information Society cannot satisfy moral imperatives that emerged to facilitate the success of a militant twentieth-century industrial state. We explain why.

In the next few years, moral anachronism will be in evidence at the core countries of the West in much the way that it has been witnessed at the periphery over the past five centuries. Western colonists and military expeditions stimulated such crises when they encountered indigenous hunting-and-gathering bands, as well as peoples whose societies were still organized for farming. The introduction of new technologies into anachronistic settings caused confusion and moral crises. The success of Christian missionaries in converting millions of indigenous peoples can be laid in large measure to

the local crises caused by the sudden introduction of new power arrangements from the outside. Such encounters recurred over and over, from the sixteenth century through the early decades of the twentieth century. We expect similar clashes early in the new millennium as Information Societies supplant those organized along industrial lines.

The Nostalgia for Compulsion

The rise of the Information Society will not be wholly welcomed as a promising new phase of history, even among those who benefit from it most. Everyone will feel some misgivings. And many will despise innovations that undermine the territorial nation-state. It is a fact of human nature that radical change of any kind is almost always seen as a dramatic turn for the worse. Five hundred years ago, the courtiers gathered around the duke of Burgundy would have said that unfolding innovations that undermined feudalism were evil. They thought the world was rapidly spiraling downhill at the very time that later historians saw an explosion of human potential in the Renaissance. Likewise, what may someday be seen as a new Renaissance from the perspective of the next millennium will look frightening to tired twentieth-century eyes.

There is a high probability that some who are offended by the new ways, as well as many who are disadvantaged by them, will react unpleasantly. Their nostalgia for compulsion will probably turn violent. Encounters with these new "Luddites" will make the transition to radical new forms of social organization at least a measure of bad news for everyone. Get ready to duck. With the speed of change outracing the moral and economic capacity of many in living generations to adapt, you can expect to see a fierce and indignant resistance to the Information Revolution, notwithstanding its great promise to liberate the future.

You must understand and prepare for such unpleasantness. A series of transition crises lies ahead. Deflationary tribulations, such as the Asian contagion that swept through the Far East to Russia and other emerging economies in 1997 and 1998, will erupt sporadically as the dated national and international institutions left over from the Industrial Era prove inadequate to the challenges of the new, dispersed, transnational economy. The new information and communication technologies are more subversive of the modern state than any political threat to its predominance since Columbus sailed. This is important because those in power have seldom reacted peacefully to developments that undermined their authority. They are not likely to now.

The clash between the new and the old will shape the early years of the new millennium. We expect it to be a time of great danger and great reward, and a time of much diminished civility in some realms and unprecedented scope in others. Increasingly autonomous individuals and bankrupt, desperate governments will confront one another across a new divide. We expect to see a radical restructuring of the nature of sovereignty and the virtual death of politics before the transition is over. Instead of state domination and control of resources, you are destined to see the privatization of almost all services governments now provide. For inescapable reasons

that we explore in this book, information technology will destroy the capacity of the state to charge more for its services than they are worth to you and other people who pay for them.

"Governments will have to deal with what sovereignty means."

– ROBERT MARTIN, CHIEF TECHNOLOGY OFFICER, LUCENT TECHNOLOGIES

Sovereignty Through Markets

To an extent that few would have imagined only a decade ago, individuals will achieve increasing autonomy over territorial nation-states through market mechanisms. All nation-states face bankruptcy and the rapid erosion of their authority. Mighty as they are, the power they retain is the power to obliterate, not to command. Their intercontinental missiles and aircraft carriers are already artifacts, as imposing and useless as the last warhorse of feudalism.

Information technology makes possible a dramatic extension of markets by altering the way that assets are created and protected. This is revolutionary. Indeed, it promises to be more revolutionary for industrial society than the advent of gunpowder proved to be for feudal agriculture. The transformation of the year 2000 implies the commercialization of sovereignty and the death of politics, no less than guns implied the demise of oath-based feudalism. Citizenship will go the way of chivalry.

We believe that the age of individual economic sovereignty is coming. Just as steel mills, telephone companies, mines, and railways that were once "nationalized" have been rapidly privatized throughout the world, you will soon see the ultimate form of privatization—the sweeping denationalization of the individual. The Sovereign Individual of the new millennium will no longer be an asset of the state, a *de facto* item on the treasury's balance sheet. After the transition of the year 2000, denationalized citizens will no longer be citizens as we know them, but customers.

Bandwidth Trumps Borders

The commercialization of sovereignty will make the terms and conditions of citizenship in the nation-state as dated as chivalric oaths seemed after the collapse of feudalism. Instead of relating to a powerful state as citizens to be taxed, the Sovereign Individuals of the twenty-first century will be customers of governments operating from a "new logical space." They will bargain for whatever minimal government they need and pay for it according to contract. The governments of the Information Age will be organized along different principles than those which the world has come to expect over the past several centuries. Some jurisdictions and sovereignty services will be formed through "assortive matching," a system by which affinities, including commercial affinities, are

the basis upon which virtual jurisdictions earn allegiance. In rare cases, the new sovereignties may be holdovers of medieval organizations, like the 900-year-old Sovereign Military Hospitaller Order of St. John of Jerusalem, of Rhodes and of Malta. More commonly known as the Knights of Malta, the order is an affinity group for rich Catholics, with 10,000 current members and an annual income of several billions. The Knights of Malta issues its own passports, stamps, and money, and carries on full diplomatic relations with seventy countries. As we write it is negotiating with the Republic of Malta to reassume possession of Fort St. Angelo. Taking possession of the castle would give the Knights the missing ingredient of territoriality that will enable it to be recognized as a sovereignty. The Knights of Malta could once again become a sovereign microstate, instantly legitimized by a long history. It was from Fort St. Angelo that the Knights of Malta turned back the Turks in the Great Siege of 1565. Indeed, they ruled Malta for many years thereafter, until they were expelled by Napoleon in 1798. If the Knights of Malta were to return in the next few years, there could be no clearer evidence that the modern nation-state system, ushered in after the French Revolution, was merely an interlude in the longer sweep of history in which it has been the norm for many kinds of sovereignties to exist at the same time.

Still another and very different model for a postmodern sovereignty based on assortive matching is the Iridium satellite telephone network. At first glance, you may think it odd to treat a cellular telephone service as a kind of sovereignty. Yet Iridium has already received recognition as a virtual sovereignty by international authorities. As you may know, Iridium is a global cellular phone service that allows subscribers to receive calls on a single number, wherever they find themselves on the planet, from Featherston, New Zealand, to the Bolivian Chaco. To allow calls to be routed to Iridium subscribers anywhere on the globe, given the architecture of global telecoms, international telecom authorities had to agree to recognize Iridium as a virtual country, with its own country code: 8816. It is a short step logically from a virtual country comprising satellite telephone subscribers to sovereignty for more coherent virtual communities on the World Wide Web that span borders. Bandwidth, or the carrying capacity of a communications medium, has been expanding faster than computational capacity multiplied after the invention of transistors. If this trend to greater bandwidth continues, as we believe likely, it is only a matter of a few years, soon after the turn of the millennium, until bandwidth becomes sufficiently capacious to make technically possible the "metaverse," the alternative, cyberspace world imagined by the science fiction novelist Neal Stephenson. Stephenson's "metaverse" is a dense virtual community with its own laws. We believe it is inevitable that, as the cybereconomy becomes richer, its participants will seek and obtain exemption from the anachronistic laws of nation-states. The new cybercommunities will be at least as wealthy and competent at advancing their interests as the Sovereign Military Hospitaller Order of St. John of Jerusalem, of Rhodes and of Malta. Indeed, they will be more capable of asserting themselves because of far-reaching communications and information warfare capabilities. We explore still other models of fragmented sovereignty in which small

groups can effectively lease the sovereignty of weak nation-states, and operate their own economic havens much as free ports and free trade zones are licensed to do today.

A new moral vocabulary will be required to describe the relations of Sovereign Individuals with one another and what remains of government. We suspect that as the terms of these new relations come into focus, they will offend many people who came of age as "citizens" of twentieth-century nation-states. The end of nations and the "denationalization of the individual" will deflate some warmly held notions, such as "equal protection under the law," that presuppose power relations that are soon to be obsolete. As virtual communities gain coherence, they will insist that their members be held accountable according to their own laws, rather than those of the former nation-states in which they happen to reside. Multiple systems of law will again coexist over the same geographic area, as they did in ancient and medieval times.

Just as attempts to preserve the power of knights in armor were doomed to fail in the face of gunpowder weapons, so the modern notions of nationalism and citizenship are destined to be short-circuited by microtechnology. Indeed, they will eventually become comic in much the way that the sacred principles of fifteenth-century feudalism fell to ridicule in the sixteenth century. The cherished civic notions of the twentieth century will be comic anachronisms to new generations after the transformation of the year 2000. The Don Quixote of the twenty-first century will not be a knight-errant struggling to revive the glories of feudalism but a bureaucrat in a brown suit, a tax collector yearning for a citizen to audit.

Samo Burja, "Social Technology"

Although people are relatively aware of the material technology that powers their lives, they are less aware of the non-material technology that influences them—namely, social technology. Just as HTTP is the operating protocol for the web, politeness is the operating protocol for our social interactions. Following the protocol will lead to predictable and desirable outcomes. Breaking the protocol will lead to inaccessible websites, or, perhaps, unwanted social awkwardness. Politeness, just like HTTP, can be documented[63] and taught.

When we talk about "social technology", we are not referring to social media platforms like Facebook or Reddit, which are properly material technologies made possible by the right arrangements of consumer electronics, server farms, and computer networks. We mean something analogous to the idea of social engineering, a concept that came about at the end of the 19th century that refers to the intentional design of specific social arrangements and ways of operating. The Reddit platform itself is not social technology, but its use of moderators is. Facebook is not a social technology, but the expectation that you will regularly post nice pictures on Facebook for mom is. Similarly, airplanes are not social technology, but people generally agreeing to tie you to your seat if you keep trying to open the service doors during a flight is. Social and material technologies often act symbiotically, but they are functionally distinct.

It's important to note that all except the simplest social technologies are designed. Though many of our crucial social technologies seem like natural parts of reality today, this was not always so. At some point they required intentional construction and adoption. Many social technologies we take for granted, including the very idea of having such critical systems as currency, law, and government, were born from concerted human agency. It is for this reason that we call it social technology, rather than social "norms", or take a more broad anthropological or philosophical approach. Much like material technology, social technology is designed, adopted, and scaled. It is proceduralized and documentable.

Social technology is a tool that directs people to knowingly or unknowingly take certain actions, and in so doing it has the ability to shape an extremely broad range of human action. It can be used to reduce coordination costs between people, causing them to work together more effectively towards a goal, but it can also be used to restrict collaboration and action.

In order to properly understand social technologies, we can examine them on an individual, institutional, and societal level.

[63] https://en.wikipedia.org/wiki/Etiquette

On an Individual Level

Social technology makes it possible for individuals to operate in their environment. We are social creatures, after all, and rely on fellow humans for even the basics of survival. If there are high coordination costs, everything in life becomes harder. What would life be like, for example, if you couldn't trust that people would follow through on contracts? What would life be like if there were no clear consequences for causing physical harm to others? Without coordination mechanisms to enforce these things, there are substantial psychological and logistical costs for individuals.

It is important to notice the existence of social technology and understand the ways it benefits yet controls you and other individuals—awareness of how you are being influenced is a prerequisite for social self-consciousness and agency. We are constantly influenced by social technology and thus are frequently unaware of it. It's difficult to understand social technology when it is inherited or when its purpose is intentionally concealed. Perhaps the best practice to overcome this difficulty is lighthearted fieldwork.

When you operate within an institution, be it a school, an office, or something even more dreadful like a prison, take some time to carefully observe those around you. Identify common behaviors that are so universally practiced they are entirely taken for granted: papers are turned in on time, informal dress codes observed, etc. Then think: what would happen if knowledge of these norms had to be learnt from the ground up by every new student or employee, or even re-invented with the establishment of every new institution? Needless to say, it would be difficult to get anything done at all. But none of these automated social practices have existed forever, and once upon a time, they were wholly new.

Furthermore, organizing people is very powerful— if you can direct people's actions, you will have a much greater influence over the world. Creating new social technologies changes how you and others can organize, providing not only an—at times decisive—advantage, but also a possibly very long lived legacy.

On an Institutional Level

Social technology makes it easier to scale institutions. The more advanced your social technology, and the more you can reduce coordination costs, the more effective your institution becomes. If you're building a purpose-driven institution—that is, an institution that isn't effectively a social club—then you will need advanced social technology to actually get your collaborators to hit the goal. Consider this: if you're assembling a team to reform a city government or build spaceships that can put people on Mars, should you motivate them by paying them lots of money and penalizing them if they don't show up? Or should you develop ways to find people who are already motivated to pursue these goals, and equip them with the skills they need to figure out what to do? Which more effectively gets people to work towards the goal?

On a Societal Level

Social technology is required for society to exist: we are born helpless into the world and must rely on others for survival. We need shared families to raise us, a shared language to communicate, shared tribes or states to maintain a peace we can live in, and so on. If there is no social technology, and thus no coordination whatsoever, you will never know what to expect from others, and therefore must protect yourself—sometimes by hurting others. A society without any social technology is a society where institutions do not exist, where groups do not exist, where family does not exist. A society without social technology is a society where the only possible accomplishments are individual accomplishments, bounded by the psychological and logistical costs of the individual protecting themselves from harm.

What does this matter to us, given that we all live in societies regulated by social technology? It matters because it renders certain criticisms invalid. For example, it does not make sense to say that certain norms in the Middle East, which may appear backwards to us, are destroying a peaceful default state. After all, the default state is not peaceful. Instead, it makes sense to understand these norms as very expensive ways of dealing with real problems—problems that we may not have to deal with because we live in a society where there is more, or more effective, social technology in place. It means that when we notice someone exhibiting extremely costly social behavior, we should ask: what coordination costs does this help to reduce?

We should be aware of the symbiotic relationship between social and material technology. That is, the failure of social technology can cause material technology to fail, and vice versa. This is because if the social technology fails, causing people to fail to coordinate, then people might not be able to coordinate effectively enough to produce material technology. The failure of social technology can cause technological dark ages. Ancient Roman architecture is an example of this. Long story short: the Roman state lost tax revenue; large scale construction ceased; architecture of this kind fell out of use; engineers became worse and thus technological knowledge (e.g. how to build an arch) was lost.

It's important to note that social technology comes with costs. In the process of building coordination mechanisms, you can also accidentally or intentionally reduce other things, such as diversity and freedom of thought. Scandinavia is an example of a very homogeneous society, and this is in part because of the social technology that is employed there, such as the Law of Jante[64], a set of norms discouraging individual achievement and non-conformity.

Social technology then forms much of everything from the simplest logistics of our lives in a household to the most complex of human arrangements mediated by markets and states Below, I'll examine a few examples of how social technology surrounds us in spheres as diverse as politics, religion and private life:

[64] https://en.wikipedia.org/wiki/Law_of_Jante

Government

Government, which is just a group of people that society has agreed it will listen to, is social technology. It is a direct actor—its many bureaucracies and allies can organize and fund building efforts, support the logistics of an advancing army, conduct scientific research, force or forbid the movement of whole populations, and so on. Governments can further change and impose laws, and such laws directly change society. It is also an indirect actor whose reach goes beyond laws: it can make public statements about what is or is not desirable; it can create spinoff institutions and invest directly into ventures. Government can grant legitimacy to ad hoc actions. It can also just act in illegal ways.

Political Theory

Political theory constitutes the engineering principles used to create government. So, political theory is social technology that allows people to build, monitor, and fix government—and organizations that function similarly. There is a thin line between creating countries and creating companies). Political theory can also function as an ideology (see section below).

Law

Law is a particularly clear example of social technology. It can be used to regulate disputes, define responsibilities, and set expectations and proceduralized bureaucratic action. Different legal systems can promote very different kinds of behavior and, in turn, reshape society. Compare ancient Roman and ancient Chinese family and inheritance laws. In both cases, your family has significant rights over you. However, under the Roman system parents have to enforce those laws themselves, and under the Chinese system the courts help parents enforce them. Differing incentives lead to similar laws being applied in different circumstances and different conditions. An impoverished or disgraced parent wouldn't necessarily have the means to enforce their claims in the Roman system, for example.

In modern states we tacitly assume that government directly enforces law, but law can be enforced in other ways. In Medieval Iceland, laws were interpreted by hereditary priests, but enforcement was left to individuals; meanwhile on the continent, the Catholic Church would at times imprison, release, or protect people on its own authority, independent from the Crown. In early modern Britain and its colonies, bounties were at times employed to track down criminals, and in ancient Rome, private individuals—tax-farmers—would collect owed taxes for profit, and keep a share as compensation. Under institutionalized codes of law, laws are enforced via punishment by the central institution. Under distributed codes of law, laws are enforced via punishment by elements of wider society.

Social Norms

Social norms are an often invisible form of social technology. It is a result of social norms that we wear clothing in public, wash our hands, and spend time with family. It is a result of social norms that we have certain expectations around what our work-life breakdown should be, and how members of each social class should act. Even the notion of being professional, or "professionalism," is a social norm.

Diplomacy

Diplomacy is the practice of relations between sovereign states that has both formalized and customary dimensions. Rulers of a state send diplomats to represent them to the rulers of other states. This diplomatic representation is called an "embassy" and before modern times it consisted of a traveling ambassador's entourage; today an embassy is a "permanent mission" to a foreign capital. While some of diplomacy's rules are codified, much of diplomacy is governed by proper protocol and manners as much as by binding rules. The intricacies of diplomatic protocol can seem arcane—such as the requirement that a state hosting a foreign head of state fire its cannons 21 times in honor of the visiting foreign dignitary. This practice emerged from the days when a ship firing this many rounds was a signal of effective disarmament, but it continues today as a sign of respect and goodwill. Diplomatic protocol allows leaders from different cultures to meet on mutually-intelligible ground. It can prevent cultural differences from impeding the practical aspects of international relations, if not the substantive business of negotiation.

Ideology

Ideology can take different forms—religion, social movement, political theory. If people believe an ideology, it will shape their actions. If a religion dictates that families have to read the word of God for themselves, for example, then adherents to that religion will have to learn how to read. In this way ideologies have notable effects on society, whether they are true or not. Max Weber notes that Protestant societies have higher literacy rates than Catholic ones.

Strategy

If people know strategy, they can know whether actions are useful for the plan, and choose to take those actions. Therefore, teaching people particular strategies can reduce coordination costs. We might expect, for example, that a country that teaches its people effective military and business strategy will out-compete other countries militarily and economically.

Education

Education in the broad sense (i.e. state-sponsored systems and otherwise) is social technology. By delivering knowledge to other people, you can reduce coordination costs, or alter people's value systems, which then reduces coordination costs.

Credentials

Credentials are artificial markings that allow people to identify experts and sort others. An example of this is a college degree. A degree is something that allows you to get a job where you otherwise couldn't have gotten hired. It is a social construct that is sometimes converted into a legal construct; for example, it can be illegal to practice architecture, law, or medicine without the right degree.

Cities

Cities are one of the longest-lasting human social formations. The city of Xi'an in China has been continuously inhabited for over 3,000 years from the Bronze Age to the Nuclear Age. It has survived multiple dynasties and governing regimes. Cities often provide fertile ground for multiple different institutions over their lifespan. Rome's empire rose and fell over a long millennium but then was replaced by the rise and—arguably—fall of the papacy, an unrelated institution, that brought Rome to its heights again in the 16th century. Cities allow increased coordination and a common market for labor and other resources. Cities also condition their inhabitants—through de facto initiation or "hazing"—towards a particular culture and outlook. This allows cities to have more shared culture than even most nations.

Healthcare

The institution of healthcare exists to maintain individual health in a bounded and specialized medical environment, offloading the burden of healthcare from society as a whole. This provides a legible and socially agreed-upon solution to the problem of physical health.

Sacrifice

The collective offering of a valuable object to a higher power can have a strong effect in coordinating group behavior. Arguably, sacrifice began as a form of sacred violence, where a scapegoat would be selected by a community to act as a lightning rod for collective violence in order to prevent that violence from turning inward and destroying the group, with the victim being sanctified after the fact. We can see many examples of this historically, for example human sacrifice as demonstrated by the Carthaginians' sacrifice of infants or the Aztecs' sacrifice of captured prisoners, or animal sacrifice as

practiced by the Ancient Greeks and the Jews before the destruction of the Second Temple. Some theorize that the modern Christian practice of taking communion—consuming the blood and body of Christ—is a sublimated form of historical sacrifice.

Ritual

Ritual in the broadest sense is a way of codifying and standardizing rote human action, and in a group setting it can act as a powerful imitative coordinating mechanism. Debates have long raged over the actual social utility of ritual—see the ancient Chinese Mohists excoriating the state for wasting scarce resources on lavish funerary rites and the Confucians rejoining that such rituals, in their packaging and transmission of abstract systems of meaning, are indispensable for social order—but regardless, the intergenerational stickiness of ritual proves its undeniable importance in human affairs.

Psychotherapy

Psychotherapy is a recent social technology that places individuals in prolonged contact with therapists, usually in a one-on-one setting, in order to apply psychological methods to improve the patient's mental health. This is usually done towards the end of helping individuals to better negotiate social life. It invites natural comparison to the benefits of the Catholic rite of confession.

Awards

The practice of giving awards and honors[65] allows an individual, such as a king, or an institution, such as the Academy of Motion Picture Arts and Sciences, to regulate status within a society, organization, or industry[66]. Rather than regulating all behavior by all people at all times, an award sets the bar for what is the highest status behavior or achievement and, by virtue of its public nature, allows everyone else to figure out for themselves how they should aspire to behave as well.

Marketing

You might build the best product in a market, but it won't matter if nobody knows about it. The practice of marketing is key to matching consumers and buyers to the right products and sellers in the most efficient way. Advanced marketing practices are arguably even good enough to sell consumers on products that they don't need, or that are selling not only a product, but an ideology as well. Without marketing, it would not be possible to quickly scale a new venture and discover if it is viable or not. The tempo of innovation would be much slower.

[65] https://samoburja.com/honors-fuel-achievement/
[66] https://samoburja.com/how-elon-musk-is-making-engineers-cool-again/

Marriage

Marriage formalizes relationships between people and prescribes roles that come with a particular set of social expectations. Historically, marriage, both monogamous and polygamous, has served as a social technology to manage many forms of human organization, from child rearing to division of labor to property law to romantic love.

Adoption

Familial relations are almost always some of the most important relations in life. Being part of a family is a biological fact, but it also gives you access to a full stack of social technologies that will regulate your life from birth to death, closely tied to the biological reality.

Adoption legitimates and makes legible the entrance into a family of an additional person, usually a child, under the custody of the heads of that family. It allows the adoptee to take on the social role of child and the adopter(s) to take on the social role of parent, thus smoothing over the social distinction between an adoptive family and a biological family and allowing for the adoptive family to integrate seamlessly into external society.

Whether the contemporary practice of adopting a child, or the ancient Roman practice of adult adoption to secure succession, the trick of overruling biology with social technology is very useful.

Dynasties

The key power of dynasties rests in the transfer of informal ties as well as formal ones. Entering office, whether in politics or business, without the right personal connections and relying solely on the powers of the office is to be almost impotent. A child born to powerful parents can be trained from birth to follow in his or her parent's footsteps. Families are also one of the few social technologies where social credit is transferred from person to person. A dear friendship with a person's father or mother can easily transfer into affinity for their child. The ability to transfer affinities across generations allows families to accumulate power social capital. While there are often conflicts within powerful families—be they the Ottoman sultans or the modern House of Saud—dynasties also align the family's incentives to a great extent. The external expectation of family loyalty—with high social costs for betrayal or defection—also reinforces cooperation.

Samo Burja, "Intellectual Dark Matter"

Knowledge that we can show exists, but cannot directly access, rests at the foundations of society and technology.

Missing mass, missing knowledge

Many galaxies would fly apart if they had as much mass as estimates based on their visible signature suggest. Although some have posited alternative theories of gravitation to explain this discrepancy, most physicists now hypothesize the existence of mass-bearing particles that are not detectable through emitted radiation such as visible light. We call these particles dark matter, and it is estimated to compose about 85% of all matter in the observable universe.

In analyzing the functional institutions of our society, we are not able to see for ourselves most of the knowledge that created them. Knowledge of this sort includes trade secrets, tacit technical knowledge, private social networks, private intelligence-gathering operations, management and persuasive skill, cooperation and collusion among founders and their allies, and founders' long-term plans for their institutions.[67]

This knowledge has profound effects on the social landscape. We must understand it if we hope to understand society. We therefore must examine intellectual dark matter: knowledge we cannot see publicly, but whose existence we can infer because our institutions would fly apart if the knowledge we see were all there was.[68] Such intellectual dark matter rests at the foundations of our society, dwarfing in scope and importance the accessible, shareable, visible knowledge on which we normally focus.

There are many forms of intellectual dark matter, but the three principal ones are lost, proprietary, and tacit knowledge.

Lost knowledge

A body of understanding becomes lost knowledge when the tradition of knowledge maintaining it ceases to exist. At the dawn of the modern era, during the Renaissance, there was a clear understanding of the importance and scope of lost knowledge. This led

[67] As a very concrete example of the final item on this list, consider the founding of Amazon.com in 1994. One could infer at the time from Bezos' previous employment, an article in his high school newspaper, and reports from his ex-girlfriend that he planned for Amazon to take over all of e-commerce to net enough money to start a space tech company. For many years, however, Amazon was only branded as a bookseller, and Bezos made sure to obscure the company's long-term plans in quarterly earnings calls. Knowledge of this intellectual dark matter would have informed your strategic outlook, either as an Amazon competitor or a prospective investor. This email chain from Paul Graham is another example of an object of this form for Airbnb.

[68] I first introduced this concept in August 2018 at a talk for the Foresight Institute.

to an ambitious intellectual effort in which scholars unearthed and attempted to understand ancient wisdom.

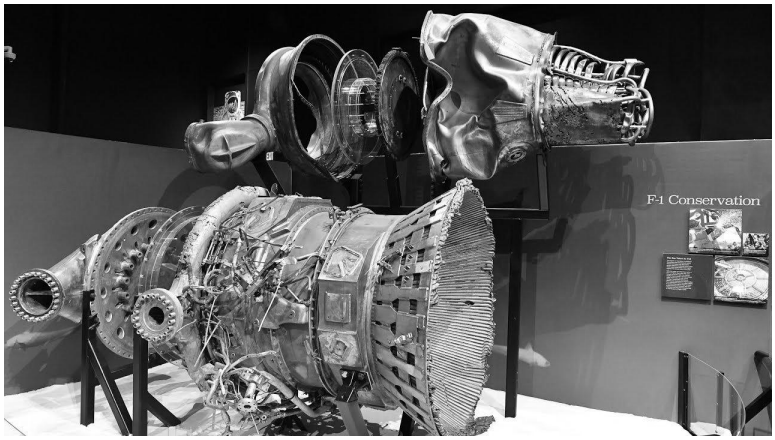
The recovered works of thinkers and scholars such as Cicero, Livy, and Thucydides were closely analyzed, and as a result now serve as the intellectual underpinning of many Western political systems. The unearthed texts of ancient Greek geometers and natural philosophers developed over centuries into modern mathematics and physics in the following scientific revolution. Our modern prosperity is arguably downstream of this discovery of lost knowledge.

The echo of this early modern period can be found in the popular conception of the Dark Ages. If a dark age is an age that has forgotten most of what was learned, we are still living in one.

The relearning of Greek and Latin works was left fundamentally incomplete. Just as physicists are only able to observe 15% of matter in existence, today we possess written fragments from only 13% of the ~2,000 ancient Greek authors known to us by name. This does not account for the authors we do not know, and only a small portion of the 13% figure consists of complete works: while we have recovered Aristotle's Politics, we only have fragments of his Economics.

Our core philosophical, political, and theological works are conceived in dialogue with Greek and Roman thought. Medieval and modern thinking so vital to the creation of our largest and most important institutions, such as that of St. Thomas Aquinas or Montesquieu, rests on the preserved works of antiquity. Those works in turn are themselves written in dialogue with further works that remain lost to us. We therefore cannot even see the intellectual foundations of our most important religious, academic, and political institutions.

Lost knowledge is not just ancient. Strategic actors of the present understand the advantage of locating and revitalizing recently lost traditions of knowledge. If you aspire to build world-class rocket engines today, you might go to great depths, even deep-sea depths, to understand rocket construction during the golden age of American space exploration. In 2013, Jeff Bezos recovered two Apollo 11 rockets from the bottom of the ocean. Do you believe that he donated them to the Smithsonian without having the team at Blue Origin, his aerospace company, reverse-engineer them first? It seems unlikely.



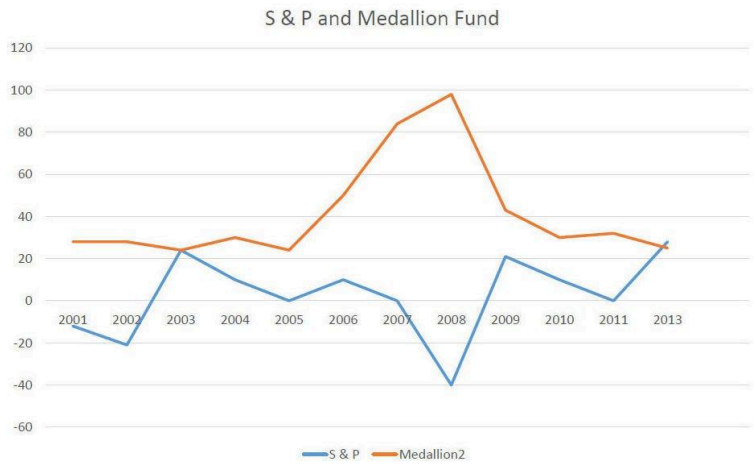
Apollo 11 engine components recovered by Jeff Bezos, currently at the Museum of Flight in Seattle.

Proprietary knowledge

The next large chunk of intellectual dark matter is proprietary knowledge. The use and spread of such knowledge is restricted by an institution guarding its monopoly.

Companies use legal means such as non-disclosure agreements and information security practices to guard against industrial espionage and secure economic advantage. For example, the Medallion Fund managed by Renaissance Technology has returned an average of 40% annually since its inception, including a 100% return in 2008, making it by far the best-performing hedge fund in history and netting its investors tens of billions of dollars. Its mathematical underpinnings are kept secret not only via non-disclosure and non-compete agreements, but also very high compensation and a carefully crafted, unique company cultures that disincentivizes interaction with the outside world.

RenTech's offices, for example, are on Long Island near Stony Brook University, about 60 miles from Manhattan, where the finance community is concentrated. This makes sense—were other quant funds to learn of its methods, Renaissance's ability to exploit market discrepancies would become far less profitable. RenTech is not unique in these practices. Bridgewater Associates, another premier hedge fund with a very unique company culture, has its offices at a secluded riverside location across the Long Island Sound in Connecticut, 20 miles from the nearest hedge fund cluster in Greenwich.



Historical performance of the Medallion Fund, 2001–2013.

Deeply networked professions can also develop a culture of restricting access to and limiting rights to use information. The purest form of such professional cultures are the guilds of medieval Europe. Only a handful of modern guilds are granted equivalent legal recognition.

The term guild is archaic but apt. Recognizing a well-coordinated contemporary guild is important for understanding economic processes. Such communities carry significant clout in our social and economic landscape, and are likelier than a single company to punish transgressions, be it through legal, economic, or reputational attacks.

Guilds also protect information through formalized training and apprenticeship. While this training may not be necessary to master the relevant skills, its first purpose is to ensure commitment from those trying to access information. One of the ways costs are imposed is through obscurantism, deliberately conveying information unclearly. By making a subject appear much more intellectually demanding than it actually is, you discourage people from attempting to learn or compete with you. The pretense of intellectual rigor allows you to overstate proprietary knowledge and thereby further increase your authority or extend it to domains beyond your expertise. The overuse of mathematics in economics is a good example of this.

Law provides an example of a field where such guilds thrive in practice, if not in name. Nearly all knowledge of how to achieve favorable judicial outcomes is local and informal. Ranked in importance for judicial outcome, understanding of what will and will not be admitted in court comes first, second comes the construction of plausible legal arguments, and only third the discovery of relevant precedent cases. This first sort of information is guarded by a particular network or law firm to help secure an economic niche, hence the high degree of specialization within law. This is also why it is possible to outsource the routine and labor-intensive task of searching for favorable

precedents to junior partners, assistants, and even machine learning algorithms—the firm is not seeking to protect that information.

Guilds and companies are not the only kind of institutions that guard proprietary knowledge. States regulate the use of information for political advantage. They make use of legal means and information security practices—much as guilds and companies—as well as all the capacities afforded by their surveillance, security, and defense apparatuses.

Tacit knowledge

Tacit knowledge is knowledge that is not transmitted in written form. For example, a blacksmith learns to craft well-balanced swords through direct practice and correction from a master—not by reading a textbook.

Most practical knowledge is tacit, and for good reason. Explicit instructions become far too complicated and cumbersome to describe even moderately difficult tasks. Moreover, people learn far more easily from practice than from books, making practice a more reliable means of teaching large numbers of people, for example workers, how to perform a task. People become fluent in languages by speaking them, not by reading language textbooks.[69]

Tacit knowledge is the most significant and widespread form of knowledge that allows institutions, and thus the economy, to function. Many professions, such as a cashier or an Uber driver, are very simple and function near the edge of automation. But those most critical to society, such as statesmen, skilled industrial workers, or engineers, require large bodies of tacit knowledge to perform well, and the best performers are highly compensated.

The Bessemer process illustrates the critical economic value of tacit knowledge and the difficulty of making it explicit. In 1856, Henry Bessemer patented a new process for making steel that was much less expensive than existing methods. He licensed the patent to several manufacturers, but they weren't able to get the process to work based on his explanations, and eventually sued Bessemer over it. Bessemer took matters into his own hands, started his own steel company, and implemented the process with great success.

[69] Learning a new language to fluency appears to be one of the rarest intellectual achievements compared to the amount of merely written education that is widely available for achieving it in both institutional—academic or governmental—and commercial contexts. Language immersion is functionally practice of a craft with a master—the fluent native speaker—and appears to be the most likely route to achieve fluency. Marko Jukic discusses this in an article that is available here.

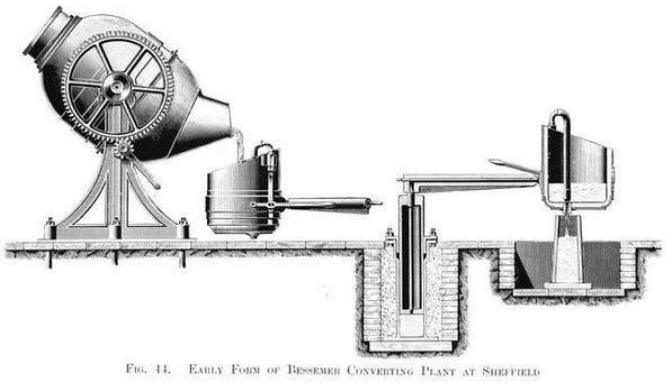


Fig. 41. Early Form of Bessemer Converting Plant at Sheffield

A sketch of a Bessemer converter.

Enormous efforts are made by strategic actors to secure and protect tacit knowledge, especially when that knowledge provides an adversarial advantage. In World War II, Germany's Wernher von Braun developed the V-2 rocket—the first guided ballistic missile—with devastating success. Neither Germany's rivals, nor its allies possessed the technology, and Germany was sure to keep this knowledge close to its chest.

As the war was ending, the SS closely guarded von Braun and his team with orders to execute them if the Allies approached. Nonetheless, the scientists managed to escape and surrender to Allied forces, after which they were immediately sent to the U.S. to train teams of American engineers and military personnel in rocketry. This was not an isolated case—the U.S. and the U.S.S.R. both carried out large special operations to capture German personnel with valuable tacit knowledge, and both benefited immensely from it.[70]

Since it cannot be easily transferred via texts, tacit knowledge must be taught via direct practice and extensive interaction with a skilled practitioner. Traditional master-apprentice relationships are the gold standard for these training relationships, though other arrangements are feasible so long as there is an economic incentive for the skilled practitioner to spend a large amount of time with his student. Otherwise, the knowledge simply isn't transferred, and with many crafts, is lost forever.

The quest for dark matter

We are standing on top of a vast system of institutions powered by intellectual dark matter. Some of this matter can be made visible—proprietary and tacit knowledge

[70] One might argue that the Allies sought to seize primarily proprietary rather than tacit knowledge in the above example. But this is not correct: the vast majority of the US & USSR's payoff came decades after they seized German scientists and industrial workers, rather than from any immediate proprietary knowledge they were able to take. For example, von Braun went on to become the architect of NASA—a project whose returns greatly exceed those of any 1945 V-2 blueprints.

function in private but can be uncovered. Much of this matter is lost, never to be seen again.

Institutions dependent on lost knowledge are running on autopilot and will fail to adapt or renew themselves. Western countries continue to have high living standards and drive the bulk of innovation, but this should not be taken for granted. Many failed institutions were once highly functional, and they can maintain the appearance of health even as the late stages of decay set in. On the eve of the financial crisis, Lehman Brothers looked as strong as ever. This is especially concerning considering how pervasive inflexible bureaucratic institutions are in our society.

We cannot predict and guide the trajectory of our society if we do not understand the importance of intellectual dark matter and so fail to locate and preserve it. The sum of public information available to us may be less important than even a small fraction of this knowledge. If we find this information and assemble it into a coherent understanding, we stand a chance of dramatically changing the world's course for the better.

Francis Bacon, *Wisdom of the Ancients*

XIX. Dædalus

1 UNDER the person of Dædalus, a man of the greatest genius but of very bad character, the ancients drew a picture of mechanical skill and industry, together with its unlawful artifices and depraved applications. Dædalus had been banished for murdering a fellow-pupil and rival; yet found favour in his banishment with kings and states. Many and excellent works, as well in honour of the gods as for the adornment and ennobling of cities and public places, had been built and modelled by him; but it is for unlawful inventions that his name is most famous. For he it was who supplied the machine which enabled Pasiphae to satisfy her passion for the bull; so that the unhappy and infamous birth of the monster Minotaurus, which devoured the ingenuous youth, was owing to the wicked industry and pernicious genius of this man. Then to conceal the first mischief he added another, and for the security of this pest devised and constructed the Labyrinth; a work wicked in its end and destination, but in respect of art and contrivance excellent and admirable. Afterwards again, that his fame might not rest on bad arts only, and that he might be sought to for remedies as well as instruments of evil, he became the author likewise of that ingenious device of the clue, by which the mazes of the labyrinth should be retraced. This Dædalus was persecuted with great severity and diligence and inquisition by Minos; yet he always found both means of escape and places of refuge. Last of all, he taught his son Icarus how to fly; who being a novice and ostentatious of his art fell from the sky into the water.

2 The parable may be interpreted thus. In the entrance is noted that envy which is strongly predominant in great artists and never lets them rest; for there is no class of men more troubled with envy, and that of the bitterest and most implacable character.

3 Then is touched the impolitic and improvident nature of the punishment inflicted; namely banishment. For it is the prerogative of famous workmen to be acceptable all over the world, insomuch that to an excellent artisan exile is scarcely any punishment at all. For whereas other modes and conditions of life cannot easily flourish out of their own country, the admiration of an artisan spreads wider and grows greater among strangers and foreigners; it being the nature of men to hold their own countrymen, in respect of mechanical arts, in less estimation.

4 The passages which follow concerning the use of mechanical arts are plain enough. Certainly human life is much indebted to them, for very many things which concern both the furniture of religion and the ornament of state and the culture of life in general, are drawn from their store. And yet out of the same fountain come instruments of lust, and also instruments of death. For (not to speak of the arts of procurers) the most exquisite poisons, also guns, and such like

engines of destruction, are the fruits of mechanical invention; and well we know how far in cruelty and destructiveness they exceed the Minotaurus himself.

5 Very beautiful again is that allegory of the labyrinth; under which the general nature of mechanics is represented. For all the more ingenious and exact mechanical inventions may, for their subtlety, their intricate variety, and the apparent likeness of one part to another, which scarcely any judgment can order and discriminate, but only the clue of experiment, be compared to a labyrinth. Nor is the next point less to the purpose; viz. that the same man who devised the mazes of the labyrinth disclosed likewise the use of the clue. For the mechanical arts may be turned either way, and serve as well for the cure as for the hurt and have power for the most part to dissolve their own spell.

Ross Douthat, "The Age of Extinction"

Every great technological change has a destructive shadow, whose depths swallow ways of life the new order renders obsolete. But the age of digital revolution—the time of the internet and the smartphone and the incipient era of artificial intelligence—threatens an especially comprehensive cull. It's forcing the human race into what evolutionary biologists call a "bottleneck"—a period of rapid pressure that threatens cultures, customs and peoples with extinction.

When college students struggle to read passages longer than a phone-size paragraph and Hollywood struggles to compete with YouTube and TikTok, that's the bottleneck putting the squeeze on traditional artistic forms like novels and movies.

When daily newspapers and mainline Protestant denominations and Elks Lodges fade into irrelevance, when sit-down restaurants and shopping malls and colleges begin to trace the same descending arc, that's the bottleneck tightening around the old forms of suburban middle-class existence.

When moderates and centrists look around and wonder why the world isn't going their way, why the future seems to belong to weird bespoke radicalisms, to Luigi Mangione admirers and World War II revisionists, that's the bottleneck crushing the old forms of consensus politics, the low-key ways of relating to political debates.

When young people don't date or marry or start families, that's the bottleneck coming for the most basic human institutions of all.

And when, because people don't pair off and reproduce, nations age and diminish and die away, when depopulation sweeps East Asia and Latin America and Europe, as it will—that's the last squeeze, the tightest part of the bottleneck, the literal die-off.

The idea that the internet carries a scythe is familiar—think of Blockbuster Video, the pay phone and other early victims of the digital transition. But the scale of the potential extinction still isn't adequately appreciated.

This isn't just a normal churn where travel agencies go out of business or Netflix replaces the VCR. Everything that we take for granted is entering into the bottleneck. And for anything that you care about—from your nation to your worldview to your favorite art form to your family—the key challenge of the 21st century is making sure that it's still there on the other side.

That challenge is made more complex by the fact that much of this extinction will seem voluntary. In a normal evolutionary bottleneck, the goal is surviving some immediate physical threat—a plague or famine, an earthquake, flood or meteor strike. The bottleneck of the digital age is different: The new era is killing us softly, by drawing people out of the real and into the virtual, distracting us from the activities that sustain ordinary life, and finally making existence at a human scale seem obsolete.

In this environment, survival will depend on intentionality and intensity. Any aspect of human culture that people assume gets transmitted automatically, without too much conscious deliberation, is what online slang calls NGMI—not going to make it.

Languages will disappear, churches will perish, political ideas will evanesce, art forms will vanish, the capacity to read and write and figure mathematically will wither, and the reproduction of the species will fail—except among people who are deliberate and self-conscious and a little bit fanatical about ensuring that the things they love are carried forward.

Mere eccentricity doesn't guarantee survival: There will be forms of resistance and radicalism that turn out to be destructive and others that are just dead ends. But normalcy and complacency will be fatal.

And while this description may sound like pessimism, it's intended as an exhortation, a call to recognize what's happening and resist it, to fight for a future where human things and human beings survive and flourish. It's an appeal for intentionality against drift, for purpose against passivity—and ultimately for life itself against extinction.

The fatal progression

But first we have to understand what we are experiencing.

It starts with substitution: The digital age takes embodied things and offers virtual substitutes, moving entire realms of human interaction and engagement from the physical marketplace to the computer screen. For romance, dating apps supplant bars and workplaces and churches. For friendship, texting and DMing replaces hanging out. For entertainment, the small screen replaces moviegoing and live performance. For shopping and selling, the online store supplants the mall. For reading and writing, the short paragraph and the quick reply replace the book, the essay, the letter.

Some of these substitutes have meaningful upsides. There are forms of intellectual and scientific work that were impossible before the internet annihilated distance. Remote work can be a boon to family life even if it limits other forms of social interaction. The online popularity of long podcasts might betoken a retreat from literate to oral culture, but it's at least counterexample to the general trend of short, shorter, shortest.

But in many cases, the virtual substitutes are clearly inferior to what they're replacing. The streaming algorithm tends to yield artistic mediocrity compared with the movies of the past, or even the golden age television shows of 20 years ago. BookTok is to literature as OnlyFans is to great romantic love. Online sources of local news are generally lousy compared with the vanished ecosystem of print newspapers. Online friendships are thinner than real-world relationships, online dating pairs fewer people off successfully than the dating markets of the prior age. Online porn—well, you get my point.

But this substitution nonetheless succeeds and deepens because of the power of distraction. Even when the new forms are inferior to the older ones, they are more addictive, more immediate, easier to access—and they feel lower-risk, as well. Swipe-based online dating is less likely to find you a spouse, but it still feels much easier than flirting or otherwise putting yourself forward in physical reality. Video games may not offer the same kind of bodily experience as sports and games in real life, but the adrenaline spike is always on offer and there are fewer limits on how late and long you can play. The infinite scroll of social media is worse than a good movie, but you can't look away, and novels are incredibly hard going by comparison with TikTok or Instagram. Pornography is worse than sex, but it gives you a simulacrum of anything you want, whenever you want it, without any negotiation with another human being's needs.

So even though people ultimately get less out of the virtual substitutes, they still tend to come back to them and eventually depend on them. Thus under digital conditions social life attenuates, romance declines, institutions lose support, the fine arts fade and the popular arts are overrun with slop, and the basic skills and habits that our civilization took for granted—how to have an extended conversation, how to approach a woman or man with romantic interest, how to sit undistracted with a movie or a book—are transmitted only weakly to the next generation.

Then, finally, as local embodied experience becomes less important than virtual alternatives, the power of substitution and distraction feeds a sense that real-world life is fundamentally obsolete.

Online life allows for all kinds of hyper-intense subcultures and niches where this sense of obsolescence is less of an issue. But for the average internet surfer, the normie afloat in the virtual realm, digital life tends to elevate the center over the peripheries, the metropole over the provinces, the drama of celebrity over the quotidian.

The result is a landscape where national politics seems incredibly important and local politics irrelevant; where English can seem like the only language worth knowing and an American presidential election feels like an election for the presidency of the world; where the life of small countries and local cultures seems at best anachronistic; where the celebrity influencer half a world away takes the place in your mental space that friends and neighbors used to occupy.

All this means that even though reality is in fact more real than the virtual world, people may still feel disappointed when they re-enter the everyday after marinating in the digital—the potential mates are less beautiful than the Instagram models, the stakes of a local mayor's race less significant than whatever Donald Trump is doing now.

That letdown creates a special political problem for liberal democracy, which depends on egalitarian ideas about the importance of the common person, the ordinary citizen. It encourages a fashionable antihumanism, an impulse to justify suicide and expand euthanasia, and a general sense of personal and cultural futility that's especially apparent when you visit the geographic locales that are aging and depopulating fastest.

There's a palpable feeling in these places that history once happened here, but that now it's happening only in America and inside your phone—so why would any people bother to build a future for themselves in provincial Italy or rural Japan, or on Caribbean islands outside of the resorts, or in the Balkans or the Baltics?

All of this describes our trajectory before artificial intelligence entered the picture, and every force I've just described is likely to become more intense the more A.I. remakes our lives. You can have far more substitution—digital workers for flesh-and-blood colleagues, ChatGPT summaries for original books, A.I. girlfriends and boyfriends and companions. You can have far more distraction—an endless stream of A.I.-generated content and entertainment and addictive slop from a "creator" whose engine never tires. And you will absolutely have a stronger sense of human obsolescence or superfluity—economic and social, artistic and intellectual—if A.I. travels just a little bit farther along its current lines of advance. It's as though all the trends of the digital era have been building up to this consummation of its logic.

How much survives?

Nothing I've described is universal: Unless the true A.I. doomsayers are correct, in the year 2100 there will still be nations, families, religions, children, marriages, great books.

But how much survives will depend on our own deliberate choices—the choice to date and love and marry and procreate, the choice to fight for particular nations and traditions and art forms and worldviews, the choice to limit our exposure to the virtual, not necessarily refusing new technology but trying every day, in every setting, to make ourselves its master.

Some of these choices will be especially difficult for liberals, since they will often smack of chauvinism and fanaticism and reaction. Family lines will survive only because of a clear preference for one's own kith and kin as opposed to just some general affection for humanity. Important art forms will survive only because of a frank elitism, an insistence on distinction, a contempt for mediocrity. Religions will survive only through a conscious embrace of neotraditionalism, in whatever varied forms. Small nations will survive only if their 21st-century inhabitants look back to 19th-century nation builders, Irish nationalists and Young Turks and the original Zionists, rather than to the end-of-history cosmopolitanism in which they're currently dissolving.

So liberalism itself will endure and thrive only if it finds a way to weave some of these intense impulses, already attenuated before the internet, back into its vision of the good society, its understanding of human needs and obligations.

For nonliberals, on the other hand, the temptation will be to embrace radicalism and disruption for their own sake, without regard to their actual fruits—a clear tendency of the populism that governs us today.

Or to imagine a swift technological solution to a crisis created by technology, even if that solution marries dehumanization with authoritarianism. (Imagine the Chinese Politburo with artificial wombs.)

Or to simply embrace the culling of the common person, the disappearance of the ordinary, the emptying of provinces and hinterlands—on the theory that some new master race of human-A.I. hybrids stand to inherit anyway.

But perhaps the strongest temptation for everyone will be to imagine that you are engaged in some radical project, some new intentional way of living, but all the while you are being pulled back into the virtual, the performative, the fundamentally unreal.

This is one temptation I'm very familiar with, as someone whose professional life is a mostly digital existence, where together with others who share my concerns I am perpetually talking, talking, talking … when the necessary thing is to go out into reality and do.

Have the child. Practice the religion. Found the school. Support the local theater, the museum, the opera or concert hall, even if you can see it all on YouTube. Pick up the paintbrush, the ball, the instrument. Learn the language—even if there's an app for it. Learn to drive, even if you think soon Waymo or Tesla will drive for you. Put up headstones, don't just burn your dead. Sit with the child, open the book, and read.

As the bottleneck tightens, all survival will depend on heeding once again the ancient admonition: *I have set before you life and death, blessing and curse. Therefore choose life, that you and your offspring may live.*

Marc Andreessen, "The Techno-Optimist Manifesto"

> *You live in a deranged age – more deranged than usual, because despite great scientific and technological advances, man has not the faintest idea of who he is or what he is doing.*
>
> Walker Percy

> *Our species is 300,000 years old. For the first 290,000 years, we were foragers, subsisting in a way that's still observable among the Bushmen of the Kalahari and the Sentinelese of the Andaman Islands. Even after Homo Sapiens embraced agriculture, progress was painfully slow. A person born in Sumer in 4,000BC would find the resources, work, and technology available in England at the time of the Norman Conquest or in the Aztec Empire at the time of Columbus quite familiar. Then, beginning in the 18th Century, many people's standard of living skyrocketed. What brought about this dramatic improvement, and why?*
>
> Marian Tupy

> *There's a way to do it better. Find it.*
>
> Thomas Edison

Lies

We are being lied to.

We are told that technology takes our jobs, reduces our wages, increases inequality, threatens our health, ruins the environment, degrades our society, corrupts our children, impairs our humanity, threatens our future, and is ever on the verge of ruining everything.

We are told to be angry, bitter, and resentful about technology.

We are told to be pessimistic.

The myth of Prometheus – in various updated forms like Frankenstein, Oppenheimer, and Terminator – haunts our nightmares.

We are told to denounce our birthright – our intelligence, our control over nature, our ability to build a better world.

We are told to be miserable about the future.

Truth

Our civilization was built on technology.

Our civilization is built on technology.

Technology is the glory of human ambition and achievement, the spearhead of progress, and the realization of our potential.

For hundreds of years, we properly glorified this – until recently.

I am here to bring the good news.

We can advance to a far superior way of living, and of being.

We have the tools, the systems, the ideas.

We have the will.

It is time, once again, to raise the technology flag.

It is time to be Techno-Optimists.

Technology

Techno-Optimists believe that societies, like sharks, grow or die.

We believe growth is progress – leading to vitality, expansion of life, increasing knowledge, higher well being.

We agree with Paul Collier when he says, "Economic growth is not a cure-all, but lack of growth is a kill-all."

We believe everything good is downstream of growth.

We believe not growing is stagnation, which leads to zero-sum thinking, internal fighting, degradation, collapse, and ultimately death.

There are only three sources of growth: population growth, natural resource utilization, and technology.

Developed societies are depopulating all over the world, across cultures – the total human population may already be shrinking.

Natural resource utilization has sharp limits, both real and political.

And so the only perpetual source of growth is technology.

In fact, technology – new knowledge, new tools, what the Greeks called techne – has always been the main source of growth, and perhaps the only cause of growth, as technology made both population growth and natural resource utilization possible.

We believe technology is a lever on the world – the way to make more with less.

Economists measure technological progress as productivity growth: How much more we can produce each year with fewer inputs, fewer raw materials. Productivity growth, powered by technology, is the main driver of economic growth, wage growth, and the creation of new industries and new jobs, as people and capital are continuously freed to do more important, valuable things than in the past. Productivity growth causes prices to fall, supply to rise, and demand to expand, improving the material well being of the entire population.

We believe this is the story of the material development of our civilization; this is why we are not still living in mud huts, eking out a meager survival and waiting for nature to kill us.

We believe this is why our descendents (sic) will live in the stars.

We believe that there is no material problem – whether created by nature or by technology – that cannot be solved with more technology.

We had a problem of starvation, so we invented the Green Revolution.

We had a problem of darkness, so we invented electric lighting.

We had a problem of cold, so we invented indoor heating.

We had a problem of heat, so we invented air conditioning.

We had a problem of isolation, so we invented the Internet.

We had a problem of pandemics, so we invented vaccines.

We have a problem of poverty, so we invent technology to create abundance.

Give us a real world problem, and we can invent technology that will solve it.

Markets

We believe free markets are the most effective way to organize a technological economy. Willing buyer meets willing seller, a price is struck, both sides benefit from the exchange or it doesn't happen. Profits are the incentive for producing supply that fulfills demand. Prices encode information about supply and demand. Markets cause entrepreneurs to seek out high prices as a signal of opportunity to create new wealth by driving those prices down.

We believe the market economy is a discovery machine, a form of intelligence – an exploratory, evolutionary, adaptive system.

We believe Hayek's Knowledge Problem overwhelms any centralized economic system. All actual information is on the edges, in the hands of the people closest to the buyer. The center, abstracted away from both the buyer and the seller, knows nothing. Centralized planning is doomed to fail, the system of production and consumption is too complex. Decentralization harnesses complexity for the benefit of everyone; centralization will starve you to death.

We believe in market discipline. The market naturally disciplines – the seller either learns and changes when the buyer fails to show, or exits the market. When market discipline is absent, there is no limit to how crazy things can get. The motto of every monopoly and cartel, every centralized institution not subject to market discipline: "We don't care, because we don't have to." Markets prevent monopolies and cartels.

We believe markets lift people out of poverty – in fact, markets are by far the most effective way to lift vast numbers of people out of poverty, and always have been. Even in totalitarian regimes, an incremental lifting of the repressive boot off the throat of the

people and their ability to produce and trade leads to rapidly rising incomes and standards of living. Lift the boot a little more, even better. Take the boot off entirely, who knows how rich everyone can get.

We believe markets are an inherently individualistic way to achieve superior collective outcomes.

We believe markets do not require people to be perfect, or even well intentioned – which is good, because, have you met people? Adam Smith: "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own self-interest. We address ourselves not to their humanity but to their self-love, and never talk to them of our own necessities, but of their advantages."

David Friedman points out that people only do things for other people for three reasons – love, money, or force. Love doesn't scale, so the economy can only run on money or force. The force experiment has been run and found wanting. Let's stick with money.

We believe the ultimate moral defense of markets is that they divert people who otherwise would raise armies and start religions into peacefully productive pursuits.

We believe markets, to quote Nicholas Stern, are how we take care of people we don't know.

We believe markets are the way to generate societal wealth for everything else we want to pay for, including basic research, social welfare programs, and national defense.

We believe there is no conflict between capitalist profits and a social welfare system that protects the vulnerable. In fact, they are aligned – the production of markets creates the economic wealth that pays for everything else we want as a society.

We believe central economic planning elevates the worst of us and drags everyone down; markets exploit the best of us to benefit all of us.

We believe central planning is a doom loop; markets are an upward spiral.

The economist William Nordhaus has shown that creators of technology are only able to capture about 2% of the economic value created by that technology. The other 98% flows through to society in the form of what economists call social surplus. Technological innovation in a market system is inherently philanthropic, by a 50:1 ratio. Who gets more value from a new technology, the single company that makes it, or the millions or billions of people who use it to improve their lives? QED.

We believe in David Ricardo's concept of comparative advantage – as distinct from competitive advantage, comparative advantage holds that even someone who is best in the world at doing everything will buy most things from other people, due to opportunity cost. Comparative advantage in the context of a properly free market guarantees high employment regardless of the level of technology.

We believe a market sets wages as a function of the marginal productivity of the worker. Therefore technology – which raises productivity – drives wages up, not down. This is

perhaps the most counterintuitive idea in all of economics, but it's true, and we have 300 years of history that prove it.

We believe in Milton Friedman's observation that human wants and needs are infinite.

We believe markets also increase societal well being by generating work in which people can productively engage. We believe a Universal Basic Income would turn people into zoo animals to be farmed by the state. Man was not meant to be farmed; man was meant to be useful, to be productive, to be proud.

We believe technological change, far from reducing the need for human work, increases it, by broadening the scope of what humans can productively do.

We believe that since human wants and needs are infinite, economic demand is infinite, and job growth can continue forever.

We believe markets are generative, not exploitative; positive sum, not zero sum. Participants in markets build on one another's work and output. James Carse describes finite games and infinite games – finite games have an end, when one person wins and another person loses; infinite games never end, as players collaborate to discover what's possible in the game. Markets are the ultimate infinite game.

The Techno-Capital Machine

Combine technology and markets and you get what Nick Land has termed the techno-capital machine, the engine of perpetual material creation, growth, and abundance.

We believe the techno-capital machine of markets and innovation never ends, but instead spirals continuously upward. Comparative advantage increases specialization and trade. Prices fall, freeing up purchasing power, creating demand. Falling prices benefit everyone who buys goods and services, which is to say everyone. Human wants and needs are endless, and entrepreneurs continuously create new goods and services to satisfy those wants and needs, deploying unlimited numbers of people and machines in the process. This upward spiral has been running for hundreds of years, despite continuous howling from Communists and Luddites. Indeed, as of 2019, before the temporary COVID disruption, the result was the largest number of jobs at the highest wages and the highest levels of material living standards in the history of the planet.

The techno-capital machine makes natural selection work for us in the realm of ideas. The best and most productive ideas win, and are combined and generate even better ideas. Those ideas materialize in the real world as technologically enabled goods and services that never would have emerged de novo.

Ray Kurzweil defines his Law of Accelerating Returns: Technological advances tend to feed on themselves, increasing the rate of further advance.

We believe in accelerationism – the conscious and deliberate propulsion of technological development – to ensure the fulfillment of the Law of Accelerating Returns. To ensure the techno-capital upward spiral continues forever.

We believe the techno-capital machine is not anti-human – in fact, it may be the most pro-human thing there is. It serves us. The techno-capital machine works for us. All the machines work for us.

We believe the cornerstone resources of the techno-capital upward spiral are intelligence and energy – ideas, and the power to make them real.

Intelligence

We believe intelligence is the ultimate engine of progress. Intelligence makes everything better. Smart people and smart societies outperform less smart ones on virtually every metric we can measure. Intelligence is the birthright of humanity; we should expand it as fully and broadly as we possibly can.

We believe intelligence is in an upward spiral – first, as more smart people around the world are recruited into the techno-capital machine; second, as people form symbiotic relationships with machines into new cybernetic systems such as companies and networks; third, as Artificial Intelligence ramps up the capabilities of our machines and ourselves.

We believe we are poised for an intelligence takeoff that will expand our capabilities to unimagined heights.

We believe Artificial Intelligence is our alchemy, our Philosopher's Stone – we are literally making sand think.

We believe Artificial Intelligence is best thought of as a universal problem solver. And we have a lot of problems to solve.

We believe Artificial Intelligence can save lives – if we let it. Medicine, among many other fields, is in the stone age compared to what we can achieve with joined human and machine intelligence working on new cures. There are scores of common causes of death that can be fixed with AI, from car crashes to pandemics to wartime friendly fire.

We believe any deceleration of AI will cost lives. Deaths that were preventable by the AI that was prevented from existing is a form of murder.

We believe in Augmented Intelligence just as much as we believe in Artificial Intelligence. Intelligent machines augment intelligent humans, driving a geometric expansion of what humans can do.

We believe Augmented Intelligence drives marginal productivity which drives wage growth which drives demand which drives the creation of new supply… with no upper bound.

Energy

Energy is life. We take it for granted, but without it, we have darkness, starvation, and pain. With it, we have light, safety, and warmth.

We believe energy should be in an upward spiral. Energy is the foundational engine of our civilization. The more energy we have, the more people we can have, and the better everyone's lives can be. We should raise everyone to the energy consumption level we have, then increase our energy 1,000x, then raise everyone else's energy 1,000x as well.

The current gap in per-capita energy use between the smaller developed world and larger developing world is enormous. That gap will close – either by massively expanding energy production, making everyone better off, or by massively reducing energy production, making everyone worse off.

We believe energy need not expand to the detriment of the natural environment. We have the silver bullet for virtually unlimited zero-emissions energy today – nuclear fission. In 1973, President Richard Nixon called for Project Independence, the construction of 1,000 nuclear power plants by the year 2000, to achieve complete US energy independence. Nixon was right; we didn't build the plants then, but we can now, anytime we decide we want to.

Atomic Energy Commissioner Thomas Murray said in 1953: "For years the splitting atom, packaged in weapons, has been our main shield against the barbarians. Now, in addition, it is a God-given instrument to do the constructive work of mankind." Murray was right too.

We believe a second energy silver bullet is coming – nuclear fusion. We should build that as well. The same bad ideas that effectively outlawed fission are going to try to outlaw fusion. We should not let them.

We believe there is no inherent conflict between the techno-capital machine and the natural environment. Per-capita US carbon emissions are lower now than they were 100 years ago, even without nuclear power.

We believe technology is the solution to environmental degradation and crisis. A technologically advanced society improves the natural environment, a technologically stagnant society ruins it. If you want to see environmental devastation, visit a former Communist country. The socialist USSR was far worse for the natural environment than the capitalist US. Google the Aral Sea.

We believe a technologically stagnant society has limited energy at the cost of environmental ruin; a technologically advanced society has unlimited clean energy for everyone.

Abundance

We believe we should place intelligence and energy in a positive feedback loop, and drive them both to infinity.

We believe we should use the feedback loop of intelligence and energy to make everything we want and need abundant.

We believe the measure of abundance is falling prices. Every time a price falls, the universe of people who buy it get a raise in buying power, which is the same as a raise in income. If a lot of goods and services drop in price, the result is an upward explosion of buying power, real income, and quality of life.

We believe that if we make both intelligence and energy "too cheap to meter", the ultimate result will be that all physical goods become as cheap as pencils. Pencils are actually quite technologically complex and difficult to manufacture, and yet nobody gets mad if you borrow a pencil and fail to return it. We should make the same true of all physical goods.

We believe we should push to drop prices across the economy through the application of technology until as many prices are effectively zero as possible, driving income levels and quality of life into the stratosphere.

We believe Andy Warhol was right when he said, "What's great about this country is America started the tradition where the richest consumers buy essentially the same things as the poorest. You can be watching TV and see Coca-Cola, and you can know that the President drinks Coke, Liz Taylor drinks Coke, and just think, you can drink Coke, too. A Coke is a Coke and no amount of money can get you a better Coke than the one the bum on the corner is drinking. All the Cokes are the same and all the Cokes are good." Same for the browser, the smartphone, the chatbot.

We believe that technology ultimately drives the world to what Buckminster Fuller called "ephemeralization" – what economists call "dematerialization". Fuller: "Technology lets you do more and more with less and less until eventually you can do everything with nothing."

We believe technological progress therefore leads to material abundance for everyone.

We believe the ultimate payoff from technological abundance can be a massive expansion in what Julian Simon called "the ultimate resource" – people.

We believe, as Simon did, that people are the ultimate resource – with more people come more creativity, more new ideas, and more technological progress.

We believe material abundance therefore ultimately means more people – a lot more people – which in turn leads to more abundance.

We believe our planet is dramatically underpopulated, compared to the population we could have with abundant intelligence, energy, and material goods.

We believe the global population can quite easily expand to 50 billion people or more, and then far beyond that as we ultimately settle other planets.

We believe that out of all of these people will come scientists, technologists, artists, and visionaries beyond our wildest dreams.

We believe the ultimate mission of technology is to advance life both on Earth and in the stars.

Not Utopia, But Close Enough

However, we are not Utopians.

We are adherents to what Thomas Sowell calls the Constrained Vision.

We believe the Constrained Vision – contra the Unconstrained Vision of Utopia, Communism, and Expertise – means taking people as they are, testing ideas empirically, and liberating people to make their own choices.

We believe in not Utopia, but also not Apocalypse.

We believe change only happens on the margin – but a lot of change across a very large margin can lead to big outcomes.

While not Utopian, we believe in what Brad DeLong terms "slouching toward Utopia" – doing the best fallen humanity can do, making things better as we go.

Becoming Technological Supermen

We believe that advancing technology is one of the most virtuous things that we can do.

We believe in deliberately and systematically transforming ourselves into the kind of people who can advance technology.

We believe this certainly means technical education, but it also means going hands on, gaining practical skills, working within and leading teams – aspiring to build something greater than oneself, aspiring to work with others to build something greater as a group.

We believe the natural human drive to make things, to gain territory, to explore the unknown can be channeled productively into building technology.

We believe that while the physical frontier, at least here on Earth, is closed, the technological frontier is wide open.

We believe in exploring and claiming the technological frontier.

We believe in the romance of technology, of industry. The eros of the train, the car, the electric light, the skyscraper. And the microchip, the neural network, the rocket, the split atom.

We believe in adventure. Undertaking the Hero's Journey, rebelling against the status quo, mapping uncharted territory, conquering dragons, and bringing home the spoils for our community.

To paraphrase a manifesto of a different time and place: "Beauty exists only in struggle. There is no masterpiece that has not an aggressive character. Technology must be a violent assault on the forces of the unknown, to force them to bow before man."

We believe that we are, have been, and will always be the masters of technology, not mastered by technology. Victim mentality is a curse in every domain of life, including in our relationship with technology – both unnecessary and self-defeating. We are not victims, we are conquerors.

We believe in nature, but we also believe in overcoming nature. We are not primitives, cowering in fear of the lightning bolt. We are the apex predator; the lightning works for us.

We believe in greatness. We admire the great technologists and industrialists who came before us, and we aspire to make them proud of us today.

And we believe in humanity – individually and collectively.

Technological Values

We believe in ambition, aggression, persistence, relentlessness – strength.

We believe in merit and achievement.

We believe in bravery, in courage.

We believe in pride, confidence, and self respect – when earned.

We believe in free thought, free speech, and free inquiry.

We believe in the actual Scientific Method and enlightenment values of free discourse and challenging the authority of experts.

We believe, as Richard Feynman said, "Science is the belief in the ignorance of experts."

And, "I would rather have questions that can't be answered than answers that can't be questioned."

We believe in local knowledge, the people with actual information making decisions, not in playing God.

We believe in embracing variance, in increasing interestingness.

We believe in risk, in leaps into the unknown.

We believe in agency, in individualism.

We believe in radical competence.

We believe in an absolute rejection of resentment. As Carrie Fisher said, "Resentment is like drinking poison and waiting for the other person to die." We take responsibility and we overcome.

We believe in competition, because we believe in evolution.

We believe in evolution, because we believe in life.

We believe in the truth.

We believe rich is better than poor, cheap is better than expensive, and abundant is better than scarce.

We believe in making everyone rich, everything cheap, and everything abundant.

We believe extrinsic motivations – wealth, fame, revenge – are fine as far as they go. But we believe intrinsic motivations – the satisfaction of building something new, the camaraderie of being on a team, the achievement of becoming a better version of oneself – are more fulfilling and more lasting.

We believe in what the Greeks called eudaimonia through arete – flourishing through excellence.

We believe technology is universalist. Technology doesn't care about your ethnicity, race, religion, national origin, gender, sexuality, political views, height, weight, hair or lack thereof. Technology is built by a virtual United Nations of talent from all over the world. Anyone with a positive attitude and a cheap laptop can contribute. Technology is the ultimate open society.

We believe in the Silicon Valley code of "pay it forward", trust via aligned incentives, generosity of spirit to help one another learn and grow.

We believe America and her allies should be strong and not weak. We believe national strength of liberal democracies flows from economic strength (financial power), cultural strength (soft power), and military strength (hard power). Economic, cultural, and military strength flow from technological strength. A technologically strong America is a force for good in a dangerous world. Technologically strong liberal democracies safeguard liberty and peace. Technologically weak liberal democracies lose to their autocratic rivals, making everyone worse off.

We believe technology makes greatness more possible and more likely.

We believe in fulfilling our potential, becoming fully human – for ourselves, our communities, and our society.

The Meaning of Life

Techno-Optimism is a material philosophy, not a political philosophy.

We are not necessarily left wing, although some of us are.

We are not necessarily right wing, although some of us are.

We are materially focused, for a reason – to open the aperture on how we may choose to live amid material abundance.

A common critique of technology is that it removes choice from our lives as machines make decisions for us. This is undoubtedly true, yet more than offset by the freedom to create our lives that flows from the material abundance created by our use of machines.

Material abundance from markets and technology opens the space for religion, for politics, and for choices of how to live, socially and individually.

We believe technology is liberatory. Liberatory of human potential. Liberatory of the human soul, the human spirit. Expanding what it can mean to be free, to be fulfilled, to be alive.

We believe technology opens the space of what it can mean to be human.

The Enemy

We have enemies.

Our enemies are not bad people – but rather bad ideas.

Our present society has been subjected to a mass demoralization campaign for six decades – against technology and against life – under varying names like "existential risk", "sustainability", "ESG", "Sustainable Development Goals", "social responsibility", "stakeholder capitalism", "Precautionary Principle", "trust and safety", "tech ethics", "risk management", "de-growth", "the limits of growth".

This demoralization campaign is based on bad ideas of the past – zombie ideas, many derived from Communism, disastrous then and now – that have refused to die.

Our enemy is stagnation.

Our enemy is anti-merit, anti-ambition, anti-striving, anti-achievement, anti-greatness.

Our enemy is statism, authoritarianism, collectivism, central planning, socialism.

Our enemy is bureaucracy, vetocracy, gerontocracy, blind deference to tradition.

Our enemy is corruption, regulatory capture, monopolies, cartels.

Our enemy is institutions that in their youth were vital and energetic and truth-seeking, but are now compromised and corroded and collapsing – blocking progress in increasingly desperate bids for continued relevance, frantically trying to justify their ongoing funding despite spiraling dysfunction and escalating ineptness.

Our enemy is the ivory tower, the know-it-all credentialed expert worldview, indulging in abstract theories, luxury beliefs, social engineering, disconnected from the real world, delusional, unelected, and unaccountable – playing God with everyone else's lives, with total insulation from the consequences.

Our enemy is speech control and thought control – the increasing use, in plain sight, of George Orwell's "1984" as an instruction manual.

Our enemy is Thomas Sowell's Unconstrained Vision, Alexander Kojeve's Universal and Homogeneous State, Thomas More's Utopia.

Our enemy is the Precautionary Principle, which would have prevented virtually all progress since man first harnessed fire. The Precautionary Principle was invented to prevent the large-scale deployment of civilian nuclear power, perhaps the most catastrophic mistake in Western society in my lifetime. The Precautionary Principle continues to inflict enormous unnecessary suffering on our world today. It is deeply immoral, and we must jettison it with extreme prejudice.

Our enemy is deceleration, de-growth, depopulation – the nihilistic wish, so trendy among our elites, for fewer people, less energy, and more suffering and death.

Our enemy is Friedrich Nietzsche's Last Man:

I tell you: one must still have chaos in oneself, to give birth to a dancing star. I tell you: you have still chaos in yourselves.

Alas! There comes the time when man will no longer give birth to any star. Alas! There comes the time of the most despicable man, who can no longer despise himself…

"What is love? What is creation? What is longing? What is a star?"—so asks the Last Man, and blinks.

The earth has become small, and on it hops the Last Man, who makes everything small. His species is ineradicable as the flea; the Last Man lives longest…

One still works, for work is a pastime. But one is careful lest the pastime should hurt one.

One no longer becomes poor or rich; both are too burdensome…

No shepherd, and one herd! Everyone wants the same; everyone is the same: he who feels differently goes voluntarily into the madhouse.

"Formerly all the world was insane,"—say the subtlest of them, and they blink.

They are clever and know all that has happened: so there is no end to their derision…

"We have discovered happiness,"—say the Last Men, and they blink.

Our enemy is… that.

We aspire to be… not that.

We will explain to people captured by these zombie ideas that their fears are unwarranted and the future is bright.

We believe these captured people are suffering from ressentiment – a witches' brew of resentment, bitterness, and rage that is causing them to hold mistaken values, values that are damaging to both themselves and the people they care about.

We believe we must help them find their way out of their self-imposed labyrinth of pain.

We invite everyone to join us in Techno-Optimism.

The water is warm.

Become our allies in the pursuit of technology, abundance, and life.

The Future

Where did we come from?

Our civilization was built on a spirit of discovery, of exploration, of industrialization.

Where are we going?

What world are we building for our children and their children, and their children?

A world of fear, guilt, and resentment?

Or a world of ambition, abundance, and adventure?

We believe in the words of David Deutsch: “We have a duty to be optimistic. Because the future is open, not predetermined and therefore cannot just be accepted: we are all responsible for what it holds. Thus it is our duty to fight for a better world.”

We owe the past, and the future.

It’s time to be a Techno-Optimist.

It’s time to build.