

Sketch for an Historical Picture of the Advances of the Human Mind

Nicolas de Condorcet

1795

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[Brackets] enclose editorial explanations. Small ·dots· enclose material that has been added, but can be read as though it were part of the original text. Occasional •bullets, and also indenting of passages that are not quotations, are meant as aids to grasping the structure of a sentence or a thought. Every four-point ellipsis indicates the omission of a brief passage that seems to present more difficulty than it is worth. Longer omissions are reported between brackets in normal-sized type.—The author's frequent first-person plural ('We shall show. . .') is replaced through out by the singular. In the work's final paragraph he refers to himself only as 'the philosopher'.—The many quiet switches from a past tense to the present tense (e.g. in the long paragraph on page 3) all occur in the French.—The A-B-C section-headings in two of the chapters are added. So are cross-headings in small capitals; each of these marks the place where a substantial new theme is launched, but there is no special indication of where it ends.—The title indicates that this was to be a preliminary sketch for a fuller picture, referred to as 'the work itself' on pages 7, 105 and 109, which explains the author's frequent mentions of what he *will* show.—His full name was Marie-Jean-Antoine-Nicolas Caritat, Marquis de Condorcet.

First launched: May 2015

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Glossary

advance: Translates *progrès* in the many places—including the work's title—where *progrès* is used as a plural noun. Its singular occurrences are translated by 'progress'.

alter: To be understood in the same sense as the French *altérer*, which it everywhere translates. The French means 'change for the worse'; we have no English word with that meaning; hence this note, which also applies to 'alteration'.

anathema: A formal act of consigning someone to damnation.

arbitrary: In early modern uses, this means 'chosen', resulting from someone's decision, or the like, with no implication (as there is in today's usage) that there weren't good reasons for the choice. On pages 16 and 69 the emphasis is on contrasting what happens because of what •some powerful person decides and what happens because of what •the law says.

art: Any practical activity that is governed by rules and (same thing?) requires skill. Portraiture, sculpting, farming, carpentry, weaving, . . .

caste: This translates *caste*. As used on pages 18–22 the word refers to cults, cliques, self-proclaimed 'professions', or the like. The meaning is vague but definitely derisive.

Christ: Condorcet uses this in its original meaning, as a general term meaning the same as 'messiah'. He gives both terms initial capitals but does not mean them as proper names. The hyphenated phrase on page 58 should be thought of as 'Jesus, the Christ'.

'civilised': In quotation marks (on pages 12–13 and 53) this word translates *politicés*, which means 'gentler, less rough' or the like.

deism: A deist is someone who believes there is a god (opposite of 'atheist'), but whose theology is *thin* compared with Christianity—e.g. the deist doesn't think of God as intervening in the world.

elysium: The home of the blessed after death in Greek mythology. In the last sentence of this work it occurs translating *élycée*, which was also the name of a royal palace in Paris.

era: Translates *époque*. 'A period of history characterised by a particular state of affairs, series of events, etc.' (OED). That isn't quite what 'epoch' means today, but it was and is the meaning of *époque*.

faculty: *faculté* This means 'basic ability', 'fundamental capacity'—an ability that a man is born with, or possesses in such a way that we can't investigate how or through what mechanism he has it.

irritability: High responsiveness to stimuli.

magistrate: Here, as elsewhere in early modern writings, a 'magistrate' is anyone with an official role in government. The magistracy is the set of all such officials, thought of as a single body.

mœurs: The *mœurs* of a people include their morality, their basic customs, their attitudes and expectations about how people will behave, their ideas about what is decent. . . and so on. This word—rhyming roughly with 'worse'—is left untranslated because it has no English equivalent. Good *English* dictionaries include it, for the same reason they have for including *Schadenfreude*.

nation: This always translates the French *nation*, though

in Condorcet's day a *nation* could be quite small, really no more than a tribe.

observation: In a good many places this translates *observation* in its sense of 'controlled, purposeful, disciplined collection of facts'. That explains why 'observations' are sometimes treated as additional to 'facts' in contexts where clearly *observed* facts are the topic. See for example page 93.

opinion: The six occurrences of this word on page 69 and one each on pages 16, 17, 55 and 79 translate the French *opinion* in a sense that doesn't correspond to any one English word. It's not **an** *opinion* or **the** *opinion* of. . . , but just *opinion*. The definition of it in the Petit Robert dictionary equates it with 'set of mental attitudes dominant in a society'.

Philosophe: As used on page 49 this is a standard French label (and sometimes an English one) for the public intellectuals of the Enlightenment in the 18th century; not necessarily philosophers.

picture: Translates *tableau*, which can also mean 'view' or 'chart' (see page 108).

popular: In early modern times this means 'of the people' or 'accessible to the people'; not (usually) 'liked by the people'.

positive: A positive law (or right) is one that has been made by men; it always stands in contrast with 'natural law (or right)', which is supposed to be inherent in nature and not an upshot of anything humans have done.

prejudice: In Condorcet's time, a *préjugé* could be any preconceived opinion; he mainly uses the word unfavourably, but not as narrowly as we do today in using 'prejudice' to refer to something pre-judged concerning race, sex, etc.

pyrrhonism: The doctrine of Pyrrho, the founder of ancient Greek scepticism, who held that nothing can be known.

speculative: This means 'having to do with non-moral propositions'. Chemistry is a 'speculative' discipline; ethics is a 'practical' one (and so is carpentry; on page 6 and elsewhere speculative/practical is aligned with science/art).

subtleties: *subtilités* When used in the plural in this work, it means 'hair-splitting', 'logic-chopping', or the like. Definitely dyslogistic.

theurgy: A system of white magic, originally practised by the Egyptian Neoplatonists, performed by the invocation and employment of beneficent spirits (Shorter OED).

tribe: This translates both *peuplade* and *tribu*. Condorcet uses *peuplade* when writing about the first three eras and the tenth; and uses *tribu* when writing about the second, third (page 15) and sixth (pages 42 and 47) eras. On page 11 the first 'tribe' is *peuplade* and the other five are *tribu*. If there's a shade of difference in their intended meanings, the present translator can't find it.

vulgar: Applied to people who have no social rank, are not much educated, and (the suggestion often is) not very intelligent.

[Condorcet's work in political science and philosophy (he was also a notable mathematician) made him a fertile source of ideas animating the French revolution, in which he was a participant until his criticisms of the Robespierre faction's excesses led to his being condemned. He hid in a friend's house for some months; then came out, was arrested and imprisoned, and died the next day—perhaps by poison (self-administered or not), perhaps through heart-failure. The present work's relation to these events is hinted at in its moving last paragraph, stated in this plaque that is now affixed to the friend's house, and explained in the anonymous Preface to its first publication.]



Preface

When Condorcet was condemned, he briefly thought of presenting to his fellow-citizens an account of his principles and his conduct as a public man. He wrote a few lines; but then, poised to recall thirty years of useful work, including all his writings since the revolution ·began·, writings

in which he had constantly attacked all the institutions that were contrary to liberty, he saw that this attempt at self-justification would be useless, and he gave it up. Being utterly free of passions ·such as resentment·, he didn't want to pollute his thought by thinking about his persecutors; so—with a sublime and continual lack of any thought about *himself*—he devoted the short amount of life left to him to something useful and lasting. This is the work presented here. It rests on many other works ·by Condorcet· in which, over many years,

- human rights were discussed and established,
- fatal blows were inflicted on superstition,
- the methods of the mathematical sciences were given new applications which open up new paths to knowledge in politics and morals,
- the true principles of social well-being were developed and demonstrated in absolutely new ways, and
- there were marks everywhere of the profound morality that banishes ·all the vices·, even the frailties of self-love; marks of the unchangeable virtues that one can't encounter without feeling a religious veneration.

What happened to Condorcet was a deplorable instance of wonderful talents lost to the country, to the cause of liberty, and to the progress of science and what it can do to meet the needs of civilized man. May it arouse regrets that will do good to the republic! This death will loom large in the pages of history, as a black mark against the era in which it has occurred. May it inspire an unbreakable attachment to the rights of which it was a violation! That is •the only homage worthy of the sage who, with the fatal sword suspended over his head, calmly meditated on how things could become better for his fellow-men; and •the only consolation possible for those who have been the objects of his affections and have known the full extent of his virtue.

Introduction

Man is born with the ability •to receive sensations, •to perceive and distinguish the simple sensations they are composed of, •to remember, recognise and combine them, •to compare their different combinations, •to grasp what they have in common and what distinguishes them from one another, and •to attach signs to all these items so as to recognise them better and more easily form new combinations from them.

This faculty [see Glossary] is developed in him

- by the action of external objects, i.e. by the presence of certain complex sensations whose constancy is independent of himself (I mean the constancy of •staying the same or •changing according to laws),
- by communication with individuals of his kind, and
- by all the artificial means that men have managed to invent ever since they first acquired this faculty.

Sensations are accompanied by pleasure and by pain; and man has the faculty of converting these momentary impressions into durable feelings—pleasurable or painful—which he experiences when he sees or remembers other sentient beings experiencing pleasures or pains.

Finally, this faculty unites with the faculty of forming and combining ideas to create ties of •interest and •duty between him and his fellow creatures—ties to which nature itself has chosen to attach our most precious episodes of happiness and our most painful sufferings.

If we observe and study only the general facts and unvarying laws in the development of these faculties, confining ourselves to what is common to the different individuals of the human species, we are engaging in the science called **metaphysics**.

But if we •consider this same development's results for the mass of individuals living at one time in one region, and •follow it down through the generations, that gives us **the picture of the advances of the human mind**. This progress is governed by the same general laws as can be seen in the development of the faculties of individuals, because it is just the upshot [*résultat*] of that individual development considered at once in many individuals united in society. That upshot at any instant depends on the upshots at the preceding instants and has an influence on future ones.

So this picture is *historical*, because it is a record of continual change based on the successive observation of human societies in the different eras they have gone through. The aim is •to exhibit the order in which the changes have occurred, •to reveal the influence of each instant on the next, and thus •to show—by the changes the human species has undergone in continually renewing itself as the centuries have unrolled—the path it has followed, the steps it has taken towards truth and happiness. These observations of what man has been and of what he is today will lead us to ways of assuring and accelerating the further advances that his nature allows him still to hope for.

That is the goal of the work I have undertaken. Its outcome will be to show, from reasoning and from facts, •that no limit has been set to how much the human faculties can improve; •that the perfectibility of man really is indefinite; •that the advances in this perfectibility—from now on they'll rise above every power that would block them—have no limit except the duration of the planet that nature has placed us on. No doubt these advances won't always go at the same rate, but they'll never be reversed—at least while the earth

keeps its present place in the system of the universe, and the general laws of this system don't subject our planet to •a general upheaval or to •changes that would block the human race from preserving and exercising the same faculties and finding the same resources.

The first state of civilisation observable in the human species is that of a small society of men •living by hunting and fishing, •having no arts [see Glossary] except for making crude weapons and household utensils and building or excavating places to live in, but •having already a language with which to communicate their needs, and a few moral ideas from which they derive common rules of conduct, •living in families, •conforming to general customs that serve for them as laws, and even •having a crude form of government.

You can see that the uncertainty and difficulty of making a living, demanding extreme physical effort alternating with absolute rest, don't leave a man with spare time in which to give himself over to his ideas and enrich his mind with new combinations of them. His ways of meeting his needs depend too much on chance and the seasons to provide a role for any occupation whose advances might be passed on; so each man focuses only on improving his own individual skill and nimbleness.

Thus the advances of the human species had to be very slow back then; they could occur only here or there when special circumstances made them possible. However, we see •the results of hunting, fishing and gathering replaced by •the food man can get from animals that he has domesticated and knows how to keep and breed. Then he adds a rough and ready agriculture: he doesn't settle for merely gathering the fruits or plants that chance throws in his way; he learns to store them, to sow or to plant them, to cultivate them so that they will reproduce.

In the first state of things a man owned only •the animals he killed, his weapons, his nets and his household utensils; then he came to own •his flock, and after that •the land he had cleared and was cultivating. When the head of a family dies, his property naturally goes to the •rest of family. Some people have surplus goods that can be preserved. If someone has a surplus of everything, that will give rise to new needs; if it is a surplus of only one commodity, and there's a shortage of some other, that leads to the idea of *exchange*; and from then on moral relations become more complicated and more numerous. [The 'new needs' remark foreshadows Condorcet's view [see page 109] that extreme wealth is a misfortune; but his present point is just to brush total surplus aside so as to get, through partial surplus, to the topic of *exchange*.] Greater security as well as more (and more certain) leisure-time enable people to engage in meditation or at least in systematic observation [see Glossary]. The practice is introduced for some people to give •part of their surplus in exchange for •work, which they then don't have to do themselves. So there exists a class of men whose time is not taken up by physical labour and whose desires extend beyond their bare needs. Industry is born; the arts that men already have expand and improve; as men become more experienced and attentive, quite casual information suggests new arts to them; as the means of living become less dangerous and less precarious, population increases accordingly; agriculture replaces other means of livelihood that can't sustain as many people per acre as agriculture can—and it favours population growth which in turn speeds up advances in agriculture. In a society that has become less nomadic, more connected, more intimate, new ideas are passed around more quickly and retained more securely. The dawn of the sciences begins to appear; man shows himself to be unlike other animal species in no longer being confined, as they are, to merely individual improvement.

As their inter-relations become more extensive, numerous and complicated, men come to need a way of

- communicating their ideas to someone who is absent,
- preserving the records of past facts more precisely than oral tradition can do it,
- fixing the conditions of an agreement more securely than by the memory of witnesses, and
- recording in a more stable way the respected customs that the members of a given society agree to conform to.

So they felt the need for writing—and they invented it. It seems at first to have consisted in straightforward pictures, then conventional pictures that presented only the characteristic features of the objects. Later on, by a kind of metaphor analogous to the metaphors already introduced into their language, the image of a *physical* object came to express *moral* ideas. The origin of those signs, like the origin of words, were inevitably forgotten in the course of time, and writing became the art of attaching a conventional sign to every idea, to every word, and then to every variant or version of each idea and word.

So now there was a written language and a spoken language, and a correspondence between them had to be established.

Some men of genius—eternal benefactors of the human race, though their names and their country are forever buried in oblivion—noticed •that all the words of a language were merely combinations of a very few basic sounds, and •that these sounds, few as they were, could form an almost infinite number of different combinations. They had the idea of using visible signs to represent not the corresponding ideas or words but the basic elements the words are composed of.

That was when alphabetic writing came on the scene: a small number of signs could be used to write anything, just

as a small number of sounds could be used to say anything. The written language was the same as the spoken language; one needed only to be able to recognise and to form these few signs; and this last step secured the advances of the human race for ever.

It might be useful *now* to invent a written language which—

- intended only for use in the sciences,
- expressing only combinations of simple ideas that are exactly the same in every mind, and
- used only in logically strict reasonings, i.e. precise and determinate operations of the mind

—would be understood by men of every country, and be translated into all their idioms without being—as those idioms themselves are—liable to be altered [see Glossary] by passing into common use.

•If we had had •this kind of writing •down the centuries, it •would only have served to prolong ignorance; but *now*, by a remarkable switch-over, it would in philosophy's hands become a useful instrument for the swift spread of enlightenment and for the improvement of scientific method.

All the peoples whose histories are known to us lie somewhere between •this level of civilisation and •the level at which we still find the savage tribes. Looking back, we see them

- sometimes making new advances,
- sometimes plunging back into ignorance,
- sometimes floating between the two alternatives or stopping at a certain limit;
- in some cases totally disappearing from the earth under the sword of conquerors, mixing with those conquerors or living in slavery, and finally
- sometimes receiving knowledge from a more enlightened people, to transmit it to other nations.

All these events form an unbroken chain of connection between the earliest periods of history and the century in which we live, between the first peoples known to us and the present nations of Europe.

So the picture that I have set out to draw can be seen to have three quite distinct parts .

•(1) **The first three eras** (pages 7–21)•

In the first part, in which travellers' tales show us the human condition among the least civilised nations •today•, we can only *guess* by what steps men who were utterly isolated—or anyway as isolated as they could be consistently with propagating the species!—were able to take the first steps leading eventually to the use of a structured language (which is what, back then, mainly distinguished them from other social animals, along with a few other differences—more extensive moral ideas and the bare beginnings of social order). •In this part of my picture•, therefore, •with no historical knowledge of the actual course of •events•, I can have no **guide** except theoretical observations regarding the development of our intellectual and moral •faculties.

•(2) **The fourth through ninth eras** (pages 22–94)•

To trace man to the point where

- he exercises arts,
- the light of science begins to shine on him,
- trade brings men together into nations, and finally
- alphabetical writing is invented,

we can add to that first **guide** the history of the various societies that have been observed in almost every intermediate state, though we can't follow any one society all the way between those two great eras of the human race.

Here the picture starts to rely to a great extent on the sequences of events that we know about from history; but •we shan't uncritically gulp down all these historical facts•; if

we are to construct a hypothetical history of a single people and depict the advances it has made, we have to select events from the histories of different nations and inter-relate and combine them.

From •the era when alphabetical writing was first known in Greece through to •the present state of mankind in the most enlightened countries of Europe we have an uninterrupted series of historical facts and observations [see Glossary], so that our picture of the journey and the advances of the human mind becomes strictly historical. Philosophy no longer has to guess at anything, has no more hypothetical surmises to make; it has only to collect and arrange facts, and exhibit the useful truths that arise from their inter-connections and from them as a whole.

•(3) **The tenth era** (pages 94–110)•

•When that is all done• there would be one last picture to be drawn—the picture of our hopes, of the advances that •are left to future generations to make and •seem to be assured by the constancy of the laws of nature. Drawing this would require showing

- by what steps things that would now seem quite out of reach must gradually become possible, and even easy;
- why, despite the transient successes of prejudices and the support they get from the corruption of governments or peoples, truth is bound to have the only lasting victory;
- by what ties nature has indissolubly united the advances of •knowledge with those of •liberty, •virtue and •respect for natural human rights;
- how these •four•, the only real goods, though so often thought of separately that they're even regarded as incompatible, must in fact eventually become downright inseparable; this being something that will happen as soon as enlightenment reaches a certain level in many nations at once—as

soon as it penetrates the whole mass of one great people whose language becomes universal and whose commercial relations spread across the whole globe.

Once this union of goods had occurred among the whole class of enlightened men, these men would be considered as friends of mankind, working together to speed the coming of its perfection and happiness.

I shall lay bare the origin, and follow the history, of the general errors that have somewhat slowed or stopped reason in its onward march, and even—often—done as much as political events to drive men back towards ignorance.

The theory of the development of our individual faculties deals not only with the sound way of reasoning, i.e. the one that shows us the truth, but just as much with the operations of the mind that lead us to error or keep us there, ranging from subtle logical errors that can catch the most penetrating thinker off his guard right out to the mad fantasies of fanatics. Similarly, the historical picture of the human mind's advances also shows how general errors are introduced, propagated, transmitted and preserved among nations. Like the truths that improve and enlighten the mind, those errors are results of its activity and of the disproportion there always is between what the mind actually knows and what it wants to know or thinks it needs to know.

Indeed, error looms even larger than that: the general laws of the development of our faculties force the creation of certain prejudices [see Glossary] in each era; and any given prejudice keeps its power to seduce or dominate after the end of the era that gave rise to it, because men retain the errors of their infancy, their country, their century, long after learning the truths needed to destroy them.

A final point: always and everywhere a man's prejudices reflect his level of education and his profession. (i) The prejudices of philosophers make it hard to learn new truths,

(ii) those of the less enlightened classes slow the spread of truths already known, and (iii) those of certain eminent or powerful professions put obstacles in the way of truth. These prejudices are the three kinds of enemies that reason constantly has to battle with, often requiring a long and painful struggle to reach victory. So the history of these battles—of the rise, triumph, and fall of prejudices—will have a large place in this work, and won't be the least important or least useful part of it.

If there is a scientific way of foreseeing the advances the human race will make, and of directing and accelerating them, its main basis must be the history of the advances already made. The idea that the history of past ages is the *only* source for rules of conduct, and that the opinions of antiquity are the *only* source of truths—that's a superstition, and philosophy has had to proscribe it. But shouldn't it also proscribe the prejudice that arrogantly rejects the lessons of experience? No doubt the only way to learn general truths in the science of man is through meditation, with fruitful combinations of ideas. But if the study of individual human beings is useful to the metaphysician and moralist, why wouldn't the study of whole societies be equally useful? And why not also to political philosophy? If it is useful to observe different societies existing at the same time, studying how they relate to one another, why wouldn't it be useful to observe them also along the time-line? Even supposing we could neglect such observation when investigating speculative [see Glossary] truths, oughtn't we to bring it in when we are applying those truths to practice, deriving from a science the art that should be its useful result? Don't our prejudices, and the evils that result from them, stem from our ancestors' prejudices? And isn't studying their origins and effects one of the surest ways to correct old prejudices and prevent new ones?

Have we reached the point where there's nothing more for us to fear, whether from new errors or from the return of old ones? where no corrupt institution can be introduced by hypocrisy and adopted through ignorance or fanaticism? where no vicious combination—no gang of malefactors—can do harm to a great people? Of course not! Well, then, wouldn't it be useful to know how nations have been deceived, corrupted, or plunged in misery?

Everything tells us that we're approaching one of the great revolutions of the human race. What can better tell us what to expect from it, and reliably guide our conduct when it happens, than the picture of the previous revolutions that have prepared the way for it? The present state of enlightenment assures us that this revolution will go well;

but isn't that conditional on our ability to bring all our strength to it? And if the price of the happiness it promises isn't to be too high, if the revolution is to spread far and fast, and if its effects are to be more complete, don't we need to go to the history of the human mind to learn what obstacles remain to be feared and how we can overcome them?

I shall divide the time through which I mean to travel into nine great eras; and in a tenth I shall venture to present some ideas about the future destiny of mankind.

I shall present only the principal features of each era; I shan't linger on details or chase down special cases. I'll point out the subjects and the upshots; further developments, and proofs, will be given in the work itself. [That last phrase is meant in contrast to this mere *sketch*.]

First era

Men come together into tribes

We have no direct observation of what preceded this state; and it is only by examining man's intellectual or moral faculties and his physical constitution that we can guess at how he reached this first (tribal) level of civilisation.

So the only way to introduce the picture of this era is to offer some remarks about those of our physical qualities that could have favoured the first formation of society, and a brief analysis of the development of our intellectual or moral faculties.

A *family* seems to be a society that is natural to man. Formed at first by the children's need for their parents, and by the mother's affection as well as by the (sometimes less lively) affection of the father, it continued—because the children's need continued—for long enough for the devel-

opment of a feeling that could arouse a desire to keep this little society together and for awareness of its advantages. A family placed on land that easily supported life could then multiply and become a tribe.

Tribes formed by the union of several families must have come later, and more rarely, because the birth of any such tribe depends on less urgent motives and on the concurrence of more circumstances.

Arts aimed at meeting the simplest needs—

- making weapons,
 - preparing food,
 - getting utensils required for this preparation,
 - preserving food for storage against times of scarcity
- were the first fruits of a continued union, and the first

features that distinguished human society from the societies that some animal species form.

In some of these tribes the women cultivate edible plants around their huts, to supplement the output of hunting and fishing. In others, in places where the earth offers edible vegetation without its being cultivated, these primitive people spend some of their time seeking and gathering. In the latter tribes, where the advantage of remaining united is less felt, little civil structure is observed beyond what a single family has. But articulate language is found in all of them.

More frequent and more durable connections with the same individuals, shared interests, and mutual help in hunting or confronting enemies—all this must have given the members of the society •the sense of *justice* and •affection for one another; and this affection soon turns into an attachment to the society itself. This inevitably led to a violent hatred for the enemies of the tribe and a desire for vengeance against them.

The first ideas of political authority came to these societies through their need for leader under whom to act in common—for tribal self-defence and for getting a better and more reliable food-supply. In matters involving the interests of the whole tribe, where a common decision had to be made, all those who would have to act on it were to be **consulted**. The weakness of the women, which excluded them from long hunting expeditions and from war—the usual subjects of debate—excluded them also from these consultations. These decisions demanded experience, so only those who could be assumed to have it were allowed to take part. And the quarrels that arose within a society disturbed its harmony and could destroy it; so it was natural to agree that the decisions would be **made** by those whose age and personal qualities inspired the greatest confidence. Such was the origin of the first political institutions.

These institutions must have been preceded by the formation of a language. The idea of expressing things by conventional signs appears to be out of the reach of human intelligence as it was at this stage of civilisation; but it's likely that such signs came into use as the work of *time*, gradually and almost imperceptibly.

The invention of the bow was the work of one very clever man; the formation of a language was the work of the whole society. These two kinds of progress are equally achievements of the human species. The more rapid kind is the result of new combinations •of ideas• that men favoured by nature can form; it's the reward for their meditations and their energy. The other, slower kind arises from •reflections and observations that are possible for anyone, and even from •habits men develop in their common course of life.

When movements are regular and rhythmic they are •less tiring to make and •easier for the observer to see or hear as orderly and structured. For those two reasons such movements give pleasure. So the origin of dance, music and poetry runs back to the infant state of society. In that state they use dance as a pastime for the young and in public festivals. They have love songs and war songs; they can even make musical instruments. The art of eloquence is not absolutely unknown in these tribes: at least they know to adopt a graver and more solemn tone in their set speeches, and even know something about rhetorical exaggeration.

The characteristic errors of this era of civilisation were:

- regarding vengeance and cruelty towards enemies as virtues,
- the opinion about females that condemns them to a sort of slavery,
- the view that one privileged family has the right to make the tribe go to war, and
- the first glimmerings of various kinds of superstition.

We'll have to explore how these errors began and what caused them. If a man has a false belief that wasn't made sort-of-natural to him by his early education, something must be at work to make him have it: it is connected with the errors of his infancy, or he has been made vulnerable to it by his interests, passions, opinions, or other circumstances.

The only 'sciences' known to savage tribes are a vague knowledge of astronomy and of some medicinal plants used in the cure of wounds and diseases; and even this knowledge is corrupted by an admixture of superstition.

But this same era—early as it is—presents us with one fact of importance in the history of the human mind. We can see in it the first hints of an institution that has had opposite effects in that history:

- accelerating the advances of enlightenment, while also spreading error,
- enriching the sciences with new truths but also plunging people into ignorance and religious servitude,
- making them purchase a few transient benefits at the price of a long and shameful tyranny.

I'm talking about the formation of a class of men who are the guardians of

- the principles of the sciences or processes of the arts,
- the mysteries or ceremonies of religion,
- the practices of superstition, and often even
- the secrets of legislation and government.

That is, I'm talking about the division of the human race into two portions: one destined to teach, the other created to believe; one arrogantly concealing what it boasts of knowing, the other receiving with respect whatever its teachers condescend to reveal; one wanting to raise itself above reason, the other humbly renouncing its own reason and abasing itself to less than human stature by crediting other men with prerogatives that raise them above their common nature.

Now at the close of the eighteenth century we still see the dregs of this distinction in our priests; and it can be found in the least civilised of primitive tribes, which also have their quacks and sorcerers! It is so general, and turns up so constantly at all stages of civilisation, that it must have a foundation in nature itself; so we shall find in the human faculties at this early period of society the cause of

- the credulity of the first dupes, and of
- the gross cunning of the first impostors.

Second era

Pastoral state of mankind

Transition from that to the agricultural state

The idea of keeping in captivity certain animals taken in hunting must easily have come to men, provided that

- the animals' tameness made them easy to keep,
- the land around the hunters' homes provided these animals with plenty to eat,
- the family didn't itself need that food, and
- the family had reason to fear starvation from the failure of later hunts or the harshness of the weather.

Having kept these animals as a simple food-supply, men came to realise that they could be made to breed and so become a more durable resource, added to by their milk. So a flock that had been regarded only as a •supplement to the produce of the hunt became •a preferred alternative to hunting—more reliable than the hunt as well as being more abundant and less trouble. Thus, hunting stopped being regarded as a source of food, let alone the main one; it was kept up only •for pleasure or •to keep predators away from the flocks, whose numbers led to their having to graze at a considerable distance from the humans' habitations.

A more sedentary and easier life-style provided leisure that was favourable to the development of the human mind. Being sure now of having enough to eat, no longer anxious about their basic needs, men looked for new sensational improvements in their ways of providing for those needs.

The arts [see Glossary] made some advances: things were learned about the art of maintaining domestic animals, of favouring their reproduction, and even of improving their breed.

They learned to use wool for clothing, replacing skins by cloth.

Society within families continued to be intimate, but became gentler. The flocks of the different families couldn't all multiply at the same rate, so differences of wealth appeared. This prompted the idea that one man might share the produce of his flocks with another who hadn't any, and who was to devote his time and efforts to the care of the first man's flocks. Then they saw that the labour of a young, fit individual was worth more than the cost of his bare subsistence; and it became the custom to keep prisoners of war as slaves instead of cutting their throats.

Hospitality, also practised among primitive people •in the first era•, is more formal and important in the pastoral state •of the second era•, even among nomadic tribes who roam in their waggons or live in tents. Opportunities for hospitality—among individuals, families, or whole peoples—arise more frequently. This act of humanity becomes a social duty, and rules are made to govern it.

As some families had not only plenty to live on but a constant surplus, while other men lacked the bare necessities, natural compassion for the latter's sufferings gave rise to benevolent feelings and the practice of beneficence.

Inevitably, *mœurs* [see Glossary] became gentler. The slavery of women became less severe, and the wives of the rich were no longer condemned to arduous work.

A growing variety of •things used to satisfy the various needs and of •instruments to make them, and growing

inequality in their distribution, had to increase the number of exchanges and hence produce genuine *trade*—which couldn't grow without making men realise the need for a common measure of exchange-value, i.e. for some kind of money.

Tribes became more numerous. To make it easier to feed their herds, they set up their fixed homes further apart; or they became nomads, i.e. switched to having movable encampments when they realised that some of their domestic animals could pull or carry burdens.

Each nation had its chief for the conduct of war; but being divided into tribes by the need to separate so as to find pasturage, each tribe also had its own chief. In nearly every tribe one family always provided the chief. But the heads of families with numerous flocks, many slaves and a great number of poorer citizens working for them shared in the authority of the chiefs of their tribes, just as these shared in the authority of the chiefs of the nation—at least when their age, experience and achievements were thought to entitle them to this. This era of society is where we must place the origin of slavery and of adult men's inequality of political rights.

Tribunals made up of family heads or tribal chiefs settled, on the basis of ideas of natural justice or of established usage, the disputes that were already growing in number and complexity. The tradition of these decisions, by confirming and perpetuating the usage, soon formed a kind of jurisprudence that was more regular and coherent than had been needed for the society's advances until then. The idea of property and property-rights had acquired greater extent and precision. The division of inheritances, now more important, needed to be governed by fixed regulations. Contracts were entered into more frequently, and became more complex; they had to be formalised; and there were laws defining what constitutes a contract and what is involved in keeping it.

The utility of observing the stars, and the occupation they provided for shepherds during their long night-watches, had to lead to some slight advances in astronomy.

But at that same time we see men perfecting the art of deceiving others in order to rob them, and of dominating their opinions by an 'authority' based on fears and fanciful hopes. More regular forms of worship, and less crudely put-together systems of faith, were established. Ideas of supernatural powers were refined, in a way; and with this 'refinement' we see spring up

- in one place princes who are also bishops,
- in another families or tribes that have charge of religious ceremonies,
- in yet another colleges of priests

—each of these being a class of individuals insolently claiming special privileges, standing apart from the people so as more thoroughly to enslave them, and trying to possess medicine and astronomy, so as to bring into a single focus all the means for subjugating minds and leave them with no way to unmask the class's hypocrisy and break its chains.

Languages became richer without becoming less figurative or less bold. The images they used were more varied and more pleasing—coming from the farmer's life as well as from the hunter's, from nature's regular phenomena as well as from its upheavals (e.g. from grass rippling in the wind as well as from volcanoes and earthquakes). Song, poetry and musical instruments were improved for an audience whose leisure-time made them more peaceful but harder to please, and allowed each to reflect on his own feelings, examine his basic ideas, and select from amongst them.

They must have noticed that some plants fed the herds better (in quantity or quality) than others. They saw the advantage of cultivating these and separating them from other plants that were less nourishing, or unhealthy, or even

dangerous; and they found ways of doing this.

Similarly, in countries where plants, grains and fruits spontaneously offered by the earth provided food for the people, in addition to what they got from the flocks, they must have observed how those plants propagated themselves; and then they must have worked to

- get them growing nearer to the human habitations;
- separate them from weeds, giving them a soil to themselves; and
- protect them from wild beasts, from the flocks, and even from the greed of other men.

These ideas will have occurred even sooner in more fertile countries where the earth's spontaneous productions were almost enough on their own to meet human needs. That's when men began to devote themselves to agriculture.

In a fertile country with a temperate climate a given stretch of ground can support many more men with grains, roots and fruit than it could support if used only as pasture for a flock. So •when soil was easy enough to work with, •when men discovered how to use for travel and transport the animals that pastoral folk had used ·for food·, and •when agricultural tools had improved somewhat—*that* is when agriculture became the most plentiful source of subsistence, and men's primary occupation; it's when the human race entered its third era.

Some peoples have remained from time immemorial in one of the two states I have described. They haven't made any advances •of their own accord or •through commercial and other relations with more civilised peoples. Those relations have given them some knowledge, some industry, and (above all) many vices; but have never been able to pull them out of their state of stagnation.

The principal causes of this phenomenon ·of social stagnation· have been:

- climate;
- habits;
- the pleasures that come with this state of almost complete independence, an independence that won't be recovered again until there are societies even more perfect than any we have today;
- men's natural attachment to opinions they acquired as infants, and to their country's customs;
- the aversion that ignorance naturally feels to every sort of novelty;
- the bodily and (even more) the mental laziness which suppressed what little curiosity the people had; and
- the dominance that superstition already had over these infant societies.

To these causes must be added the greed, cruelty, corruption and prejudices of 'civilised' [see Glossary] nations, which seemed to these ·more primitive· folk to be

•stronger, richer, more informed and more active, but at the same time

•more vicious and (especially) less happy than they themselves were. They must often have been less •impressed with the superiority of such 'civilised' nations than •scared off by the number and extent of their needs, the torments they suffer through greed, the continual agitations of their passions—always active and never satisfied. Some philosophers have looked down on these ·primitive· people as stupid and lazy, while others have praised them as wise and virtuous.

This issue between these attitudes will be settled in the course of the present work. I'll show •why the mind's advances haven't always led to society's advancing towards happiness and virtue; and •how the the good that should flow from knowledge been altered [see Glossary] by an admixture of prejudices and errors, because that good depends more on

the knowledge's purity than on its extent. It will turn out that when a rude society's journey towards the state of civilisation of an enlightened and free people goes through a period of storms and troubles, this isn't a sign of degeneration in the human species, but rather a necessary crisis in its slow journey towards absolute perfection. You'll see that the vices

of 'civilised' nations have been produced not by the increase of knowledge but by its decline; and that knowledge—far from corrupting men—has at least made them less violent, even where it hasn't been able to correct or fundamentally change them.

Third era

Advances of mankind from the agricultural state to the invention of alphabetical writing

The uniformity of the picture I have drawn up to here will soon disappear. It will no longer be a matter of •considering peoples each of which is attached to its own soil and goes through the years as a single family with almost no mixing with anyone from the outside, and •noting only the faint shades of difference in *mœurs* [see Glossary], characters, opinions and superstitions that distinguish them from one another.

Before long, invasions, conquests, the rise and overthrow of empires, will mix and jumble nations, sometimes scattering them over new territories, sometimes covering the same terrain with different peoples.

Chance events will continually interfere with nature's slow but regular movement, often slowing it down, sometimes speeding it up.

When we observe a phenomenon in a nation at a certain time, its cause may well have been a big event that occurred a thousand leagues away and a thousand years earlier; and many of those events whose influence we see operating on our predecessors, and sometimes on ourselves, are hidden in the night of time. [Condorcet is here likening 'hidden in the past'

to 'hidden in the darkness'.]

But first we should look at how such a big event affects a single people independently of any influence from conquests and the intermixture of peoples.

Agriculture attaches man to the ground that he cultivates. If he wanted to move, he *could* move his person, his family, his hunting gear, and his flocks, which he could drive before him; •but he is still pinned down, because• in such a move he would find no nourishment for himself or for the animals he lives on, since the only land that might supply it would already belong to someone else.

Each parcel of land has a master who is the sole owner of its produce. When the output is more than is needed to feed and support the men and animals who have prepared it, the surplus gives the proprietor an annual income that he doesn't need to work for.

In the first two states of society, every individual—or at least every family—practised most of the necessary arts. But •when there were men who received unearned income from their land, and others who earned wages by working for them,

- when occupations were multiplied, and
- when the activities involved in the arts became more extensive and complicated,

it soon came to be in everyone's interest to divide them, .i.e. to get each individual to become a specialist in one art or a small group of related arts. They saw that an individual worked better when he had fewer kinds of thing to do; that the hand performed faster and more precisely a smaller number of operations that had been done often enough to become habitual; that less intelligence was needed to do something well if it had been repeated more often.

Thus, while some men devoted themselves to farming, others made farm implements. The care of flocks, household management, the making of clothes—all these became similarly distinct occupations. In a family with little property, one of these occupations wasn't enough to occupy the whole of an individual's time; and in these cases several such families jointly used the services and paid the wages of one man. Before long there was an increase in kinds of materials used in the arts, and the differences among them demanded different kinds of treatment. Where these differences were small, that created a distinct group of arts with a particular class of workmen. Trade expanded, taking in more objects and getting them from further afield; and then another class of men was formed, solely occupied in buying commodities, preserving and transporting them, and re-selling them at a profit.

Thus to the three classes of men in pastoral life—

- proprietors,
- domestics working for the proprietors' families, and
- slaves,

we must now add

- artisans of various kinds, and
- merchants.

This created a society that was more fixed, more close-knit and more complex, so that a need was felt for a more regular and comprehensive code of legislation; for more precision about the punishments for crimes and the formalities of contracts; for stricter rules regarding how to establish the facts in any legal case. These advances were the slow and gradual work of need and of circumstances; they took men only a few steps further along the road the pastoral nations had been following.

In the first two eras education was purely domestic. The children got their education through contact with their father, learning to do everyday tasks and also to practise whatever arts [see Glossary] he knew. From him they received •the few traditions that made up the history of the tribe and of the family, •the fables that had been passed down, •the knowledge of the national customs, principles and prejudices [see Glossary] that will have composed their rough-hewn morality. Singing, dancing and military exercises they acquired in the society of their friends.

In the era we have now reached, the children of the richer families received a sort of common education—either in towns through conversation with the elderly or in the house of some chief to whom they were assigned. That's how they were instructed in the country's laws, customs and prejudices, and how they learned to sing the poems in which its history had been encapsulated.

A more sedentary mode of life had created more equality between the sexes. The wives were no longer thought of solely as *useful*, as slaves who were more familiar with their master than the other slaves. The man now saw them as companions, and eventually learned how they could increase his happiness. Yet even in countries where wives were treated with most respect—where polygamy was forbidden—neither reason nor justice extended so far as to establish perfect

equality in •the duties and rights relating to divorce or in •the punishment for •marital• infidelity.

The history of this class of prejudices, and of their influence on the fate of the human species, must figure in the picture I'm planning to draw; and nothing will show better how human happiness depends on the advances of reason.

Some nations remained scattered across the countryside. Others pulled themselves together into towns in which lived •the chief of the nation (called by some title meaning 'king'), •the tribal chiefs who shared power with him, and •the elders of each big family. That is where the society's common affairs were decided, and where individual disputes were adjudicated. It's also where the rich brought their most valuable possessions so as to protect them from robbers (who were of course increasing when the wealth from unearned incomes was growing). When the people of a nation remained scattered across their territory, custom determined the time and place where the chiefs would meet to deliberate on the general interests of the community and to adjudicate law-suits.

Nations that recognised a common origin and spoke the same language nearly always entered into a confederacy, agreeing to come together •against foreign enemies or •to avenge wrongs done to any of them, or •to perform in common some religious duty. Such confederacies were more or less close, but didn't go as far as promising not to go to war with each other.

Hospitality and trade produced some lasting ties even between nations with different origins, customs and languages. Such ties were often broken by piracy and war, but were later renewed by necessity, a stronger force than the love of plunder or the thirst for vengeance.

Slaughtering the vanquished, or robbing them of everything and reducing them to slavery, stopped being the only

acknowledged way for victorious nations to behave. The surrender of land, ransoms, tribute, partly replaced those barbaric outrages.

In this era every man who owned weapons was a soldier. The man who

- had the best weapons,
- had made the best use of them,
- could furnish arms for others on condition that they followed him to war, and
- had the wealth to meet their needs

inevitably became a chief; but this almost voluntary obedience didn't involve his followers in a servile dependence.

These rudimentary governments nearly always had a hereditary succession system for their first chiefs or 'kings'; and other subordinate chiefs *grabbed* the prerogative of sharing the political authority among themselves, and exercising such functions of government as those of magistracy. Yet the men under these governments believed themselves to be free! •There were four reasons for this•. •There was seldom any need for new laws. •There were no public expenses that the citizens were forced to help meet; unavoidable expenses were defrayed out of the property of the chiefs or the product of common lands. •No-one had yet had the idea of constraining industry and trade by regulations. •Aggressive wars were decided by general consent, or waged only by those who were allured by the love of glory or desire for plunder.

But often a 'king' surrendered himself to the impulse of personal vengeance, to arbitrary acts of violence; often crimes broke out *within* these privileged families, caused by pride, hereditary hatred, the turmoils of love and greed for gold; while the chiefs who lived in the towns—the instruments of the kings' passions—aroused factions and civil wars there, oppressed the people by wicked judgments, and plagued them by their ambitious and piratical crimes.

In many nations the excesses of these families exhausted the people's patience; they were accordingly crushed, hunted down, or subjected to the common law; in rare cases a family was allowed to keep its *royal title* with the common law setting limits to its *authority*—and that was the establishing of what have since been called 'republics'.

·TYRANNY·

In other cases these kings, *protectively* surrounded by henchmen whose loyalty they bought with weapons and treasures, exercised absolute authority—and that was the origin of tyranny. (In other territories, especially ones where the small nations [see Glossary] didn't come together in towns, those rudimentary institutions kept their early forms until these populations either *fell under the yoke of a conqueror* or, themselves driven by the robber spirit, *became the plundering conquerors of other lands.*)

This tyranny, compressed within too narrow a space, couldn't last long. The people soon threw off a yoke that had been imposed purely by force and that and that even opinion [see Glossary] could not have kept in place. They had such a *close view* of the monster that they felt more horror *at its doings* than fear *of the consequences of resisting it*; and neither force nor public acceptance could forge durable chains unless the tyrant extended his power over a large enough area to be able, by dividing the nation he oppressed, to conceal from it the secret of its power and his weakness!

The history of republics belongs to the fourth era: but the third, which we are now considering, is about to show us something new.

·FEUDALISM·

An agricultural people that is subjected to a foreign power doesn't abandon its homes: necessity obliges it to *continue farming*, and thus to *work for its masters*.

(a) In some cases the ruling nation contents itself with *leaving* the conquered territory after supplying it with captains to govern it and soldiers to *defend it* and (especially) to *keep the inhabitants under control* and to extract a tribute of money or other goods from that submissive and disarmed populace.

(b) In other cases it *occupies* the conquered territory and gives its farms and estates to the soldiers and officers of the conquering army, in return for military service and a *monetary* tribute. The previous cultivators of each estate are required to stay at work on it, this being a new kind of slavery governed by more or less strict laws.

(c) *In a variant on this arrangement* the conquering nation keeps the ownership of the territory to itself, and merely distributes the *benefits of ownership* in the way I have just described.

Nearly always, though, all three of these systems for rewarding the soldiers and robbing the vanquished are in play at the same time.

Hence we see new classes of men come into being: the descendants of the conquering nation, constituting

- an hereditary nobility (not to be confused with the patrician dignity of republics);

and the descendants of the vanquished, dividing into

- a people condemned to labour, dependence and humiliation, but not going as far as slavery, and lastly
- field-slaves, whose servitude is less arbitrary [see Glossary] than that of domestic slaves because they can appeal to the law against the whims of their masters.

Here we see the origin of the feudal system, a curse that has turned up in nearly every part of the globe at a certain stage of civilisation, and always where a single territory was occupied by two peoples between whom military victory has established an hereditary inequality.

·DESPOTISM·

Despotism—to complete the list—was also an upshot of conquest. I'm not talking here about short-term tyrannies; in my usage 'despotism' refers to the oppression of a people by a single man who governs it by opinion [see Glossary], by habit and above all by a military force; each of his military people is totally under his thumb, but ·taking them as a group· he has to respect their prejudices, gratify their whims, and cater to their greed and pride.

Protected by a large hand-picked guard drawn from this armed force, belonging to the conquering nation and thus *foreigners* from the point of view of the populace; surrounded by the most powerful military captains; controlling the provinces through generals commanding inferior detachments of this same army—the despot reigns by terror. And no-one among the beaten people, or among those dispersed and mutually suspicious generals, can conceive of the possibility of opposing the despot with a force that couldn't be swiftly wiped out by the armies at his command.

A mutiny of the bodyguard or an insurrection in the capital may be fatal to the despot but they won't weaken the despotism. The general of a victorious army may destroy a supposedly sacred family, thereby establishing a new dynasty—but only so as to continue the same tyranny.

In this third era, peoples who haven't yet had the misfortune of conquering or of being conquered show the simple hardy virtues of agricultural nations, the *mœurs* [see Glossary] of heroic times, whose mixture of nobility and savagery, of generosity and barbarism, present a picture that draws us in so that we still admire them and even wish they hadn't gone.

On the other side, empires founded by conquerors present us with a picture of all the varieties of vileness and corruption that the human species can be reduced to by despotism and

superstition. There we see spring up •taxes on industry and trade, •fees a man must pay to be allowed to employ his talents as he pleases, •laws restricting him in his choice of work and use of his property, •other laws compelling each child to follow his father's profession, •confiscations, •atrocious tortures—in short, all the acts of arbitrary power, legalised tyranny and superstitious atrocities that a contempt for mankind has been able to invent.

In tribes that didn't have the help of any big revolution, the advances of civilisation can be seen to stop pretty early. Their members were already aware of that *need for new ideas or sensations* which is the fundamental force behind the advances of the human mind, generating both

- the taste for the superfluities of luxury that serves as a spur to industry and
- the curiosity that eagerly tries to pierce the veil that nature has thrown over her secrets.

But almost everywhere men dealt with this need by seeking and frenetically adopting *physical* means for getting sensations that could be continually renewed—for example, habitually using fermented liquors, distilled drinks, opium, tobacco or betel. Nearly every nation has at least one of these habits, which create a pleasure that

- fills whole days or can be repeated at any time,
- prevents the weight of time from being felt,
- satisfies the need for distraction or stimulation and then stifles it, and
- prolongs the infancy and inactivity of the human mind.

These habits, which have been an obstacle to the advances of ignorant or enslaved nations, are still at work in enlightened countries, where they block the truth from spreading a pure and equal light through all ·social· classes.

An account of the state of the arts in the first two eras of

society show how those primitive people were able to go on from the arts of working wood, stone, or the bones of animals, of preparing skins and of making cloth, to the more difficult arts of dyeing, making pottery, and even the beginnings of metal-work.

In isolated nations these arts will have advanced only slowly; but relations amongst these nations, slight as they were, served to speed things up. A new process discovered by one people became common property among its neighbours. Conquest, which has so often destroyed the arts, began by spreading and improving them and then stopped their progress or contributed to their collapse.

We see many of these arts carried to the highest degree of perfection among peoples in whom the long influence of superstition and despotism has completed the degradation of all the human faculties. But if we look at the superb products of this industry—an industry that at each stage involved exaggerated respect for what had gone before—we shan't see anything in them that speaks of genius; all their perfections appear to be the slow painstaking output of tedious routine; we see everywhere, alongside this work that astonishes us, marks of ignorance and stupidity that reveal to us its origin.

·SCIENCES AND PSEUDO-SCIENCE·

In non-nomadic peaceful societies, some improvements were made in astronomy, medicine, the simplest notions of anatomy, the knowledge of plants and minerals—the first elements of the study of the phenomena of nature. Or, really, these branches of knowledge grew through the mere influence of time, which increased the stock of observations and thus led men slowly but surely to an ability to grasp easily—almost intuitively—some of the general consequences those observations led to.

But these advances were very small; and the sciences would have stayed longer in their infant state if certain families, and especially particular **castes** [see Glossary], hadn't based their prestige or their power on them.

To the observation of nature they had already been able to add the observation of man and of societies. Already a few maxims of practical morality and of politics were being passed down the generations: those **castes** seized on them and enlarged their domain by bringing in religious ideas, prejudices and superstitions. They were the heirs to the first associations—the first families—of charlatans and sorcerers; but they needed and used more skill to seduce the more sophisticated minds of their victims. Their real knowledge, the apparent austerity of their lives, and their hypocritical contempt for everything that plain men want gave weight to their magic tricks, while these tricks gave to their slender stock of knowledge and their hypocritical virtues a sacred status in the eyes of the people. The members of these societies or castes pursued at first, with almost equal enthusiasm, two quite different goals: •getting new knowledge for themselves, and •using the knowledge they already had to deceive the people, to dominate their minds.

Their learned men worked mainly on astronomy; and judging by the skimpy records of their labours they seem to have carried astronomy as far as it could go without the help of telescopes or of mathematics more advanced than they had.

The fact is that a long series of observations can lead a man to some knowledge of the motions of the heavenly bodies—knowledge precise enough to enable him to calculate and predict celestial events. These empirical laws—easier to discover the longer the observations have gone on—didn't lead the first astronomers to discover the general laws of the system of the universe; but they served as well as the general

laws would have for every purpose that could concern human needs or curiosity, and they added to the credibility of these *usurpers* of the exclusive right to educate.

It seems that we're indebted to them for the ingenious device of . . . •representing all possible numbers by a few signs and •using very simple technical operations to perform calculations that would have defeated the unaided human intellect. This is the first example of those methods that double the mind's powers, enabling it to push its frontiers out indefinitely.

But they seem not to have extended the science of arithmetic beyond its first operations.

Their geometry, including what they needed for surveying and for the practice of astronomy, got no further than the famous theorem that Pythagoras brought to Greece or re-discovered for himself.

They left the theory of machines to those who were to use them. But some accounts, in which there is a mixture of fable, seem to claim that they developed this branch of the sciences themselves, as one more way of impressing men's minds by their 'miracles'.

The laws of motion, the science of mechanical powers, didn't attract their attention.

Though they studied medicine and surgery, especially for the treatment of wounds, they ignored anatomy.

Their knowledge in botany and natural history was confined to stuff used as remedies, to some plants, and to minerals whose special properties could serve their purposes.

Their chemistry, which came down to simple processes with no theory or method or analysis, consisted in •making certain preparations, •knowing a few secrets involved in medicine or the arts, and •performing certain tricks to dazzle an ignorant multitude whose rulers were as ignorant as they were.

Advances in the sciences were for them nothing but a secondary goal, a mere means of preserving or extending their power. They looked for the truth only so as to spread errors; no wonder they so seldom found it!

But these men couldn't have made even these slow and feeble advances if they hadn't known the art of writing, which is the only way by which knowledge, once it starts to grow, can be fixed, communicated and passed on.

So hieroglyphic writing either •had been discovered before these 'teaching' castes were formed or •was one of the first things that *they* invented.

Because their goal was not to enlighten but to dominate, they not only withheld some of their knowledge from the people but adulterated with errors the parts they were willing to disclose. They taught not what they believed to be true but what it was useful to them to teach.

Everything they gave to the people had an admixture of a something-or-other supernatural, sacred, heavenly, which led to their being regarded as superior to humanity, clothed with a divine character, recipients from heaven itself of knowledge forbidden to other men.

So they had two doctrines—one for themselves, the other for the people. Often indeed they divided themselves into different *orders*, each with its own exclusive mysteries. All the •members of the• lower orders were dupes as well as scoundrels; it was only a few adepts •in the highest order• who had a view of this hypocritical system as a whole.

•USE AND MISUSE OF LANGUAGE•

Nothing was more favourable to the establishment of this double doctrine than the changes in languages that were the work of time, communication, and the mixing of peoples. The double-doctrine men retained the old pre-change language or used a foreign one, thereby getting the advantage of having

a language understood only by themselves.

The first writing represented things by a more or less accurate *picture* of the thing itself or of something analogous to it; but this was replaced by a simpler form of writing in which *resemblance* pretty much dropped out in favour of signs that were purely conventional ·in their meanings·; so the secret doctrine ·of the castes· came to have its own writing, as it had already had its own spoken language.

In the origin of languages almost every word is a metaphor and every sentence an allegory—in the sense of ‘an extended or continued metaphor’. The mind catches the figurative sense and the proper sense, both at once; the word presents, along with the idea, the analogous image by which it has been expressed. But from the habit of using a word in its figurative sense the mind ends up using it *only* in that sense, filtering out the original sense; and in this way what used to be the word’s figurative sense gradually becomes its proper and ordinary sense.

The priests, who were the guardians of the original allegorical language, used it in their dealings with the people, who could no longer grasp its true [*véritable*] meaning. Having become accustomed to using each word with a single meaning which had become its proper [*propre*] one, the people received heaven-knows-what absurd fables from expressions that conveyed to the priests’ minds a plain and simple truth. They used their sacred writing in the same way. Where the priests reported an astronomical phenomenon or an event in recent history, the people saw men, animals, monsters.

Thus, for example, priests almost everywhere invented the metaphysical system of a great, immense, eternal *Whole*, of which •all •other• beings were only parts and •all observable events in the universe were only changes of state. All they got from the heavens were **(a)** groups of stars scattered through the immensity of space, **(b)** planets following more or less

complicated paths, and **(c)**

next phrase: *phénomènes purement physiques*

literally meaning: purely physical phenomena

what he probably meant: events occurring on the earth,

resulting from the positions of these heavenly bodies. As an aid to **(c)** explaining ·earthly· phenomena they gave names to these **(a)** constellations and planets, as well as to **(b)** the fixed or movable circles they had invented to represent their positions and apparent movements.

But their language, their records—which they took to express these metaphysical opinions, these natural truths—exhibited to the eyes of the people the most extravagant system of mythology, and became their basis for the most absurd creeds, the most senseless modes of worship and the most shameful or barbaric practices.

Such is the origin of almost all known religions, which the hypocrisy or the wild-mindedness of their inventors and their disciples afterwards loaded with new fables.

·THE CASE OF ASIA·

These castes took over education, so as to make each man more patiently willing to endure his chains—the chains that constituted his existence, so to speak—keeping him from being able even to *want* to break them. How far can these institutions, even without the aid of superstitious terrors, carry their power to harm the human faculties? Well, look for a moment at China. •The Chinese seem to have preceded all others in the arts and sciences, only to see themselves successively eclipsed by them all. •Their knowledge of artillery hasn’t saved them from being conquered by barbarous nations. •Their numerous schools of the sciences are open to every class of citizens, and are a route to every kind of advancement; but they are fettered by absurd prejudices,

which condemn them to eternal mediocrity. And, finally, •even the invention of printing has remained for the Chinese totally useless in advancing the human mind.

Men who had something to gain from deception were bound to turn against the pursuit of truth. Content with the people's docility, they thought they had no need for any further help to keep them docile. They themselves gradually forgot some of the truths concealed under their allegories; all they preserved of their previous science was the part that was strictly needed to maintain the confidence of their disciples; and •for the rest• they eventually became the dupes of their own fables.

From then onwards all progress in the sciences stopped, and even some of what previous centuries had witnessed was lost to the generations that followed. The human mind, a prey to ignorance and prejudice, was condemned to a shameful stagnation in those vast empires whose uninterrupted existence has dishonoured Asia for so long.

The peoples who inhabit those empires are the only ones we know who have combined this level of civilisation with such decadence. Those in the rest of the globe have been

- merely• *stopped* in their advances, giving us a re-play of the infant days of the human race, or else
- dragged along* by events through the more recent eras that I shall be describing in due course.

In the era we are considering, these same peoples of Asia

had invented alphabetical writing, which they substituted for hieroglyphics, apparently after •an **intermediate** stage in which• they adopted that other type of writing in which each idea has its own conventional sign—this being the only one that the Chinese know even today.

History and reasoning can throw some light on how the gradual transition from hieroglyphics to this **intermediate** sort of writing must have taken place; but nothing can tell us with any precision where or when alphabetical writing was first brought into use.

This discovery was in time introduced into Greece, i.e. to the home of that people

- which has exercised such a powerful and favourable influence on the advances of the human species,
- whose genius opened up for it all the avenues to truth,
- which was prepared by nature and destined by fate to be the benefactor and guide of all nations and all ages.

Up to now no other people has shared in this honour. Since that time only one nation has been able to *hope* to conduct a new revolution in the destiny of mankind. And both nature and the concurrence of events seem to agree in reserving this glory for the nation in question. But let's not try to see into the still uncertain future. [Condorcet is referring here to the French revolution, which is ongoing as he writes.]

Fourth era
Advances of the human mind in Greece
up to the division of the sciences about the time of Alexander

The Greeks, disgusted with those kings who called themselves the children of the gods and disgraced humanity by their passions and their crimes, divided themselves into republics. Lacedaemonia—a region of Greece whose capital city was Sparta—was the only one that accepted *hereditary* chiefs; but these chiefs were kept within limits by other branches of government, subjected to the same laws as the citizens, and weakened by the division of royalty between the oldest sons of the two branches of the family of Heraclides.

The inhabitants of Macedonia, Thessaly and Epirus—connected to the Greeks by a common origin and the use of the same language, and governed by monarchs who were weak and divided among themselves—weren't strong enough to oppress Greece but were adequate to protect its northern edge from incursions by the Scythian nations.

To the west: there was nothing to fear from Italy, which was divided into small isolated states; and most of Sicily and the finest ports in the south of Italy were no threats because they were already occupied by Greek colonies; these were independent republics but with familial ties to their mother cities in Greece. Other colonies were established in the islands of the Aegean sea and on one stretch of the coast of Asia Minor. So it turned out that the only real threat to Greece's independence and the freedom of its inhabitants was the union of this part of the Asiatic continent with the vast empire of Cyrus.

Tyranny, though more durable in some colonies (especially ones established before the royal families were wiped

out), could only be considered as a transient and partial evil that made the inhabitants of a few towns miserable but didn't influence the general spirit of the nation.

Greece had acquired from the eastern peoples their arts, some of their knowledge, the use of alphabetic writing and their system of religion; but this happened through contacts between Greece and these peoples brought about by refugees from the East who had sought asylum in Greece and Greek travellers who had brought knowledge and errors from the East.

In Greece, therefore, the sciences couldn't become the occupation and preserve of one particular caste. The role of their priests was confined to the worship of the gods. Genius could deploy all its forces there without having to submit to the pedantic rituals or hypocritical theories of a college of priests. All men had an equal right to know the truth. All could pursue it and communicate it, without deletions, to everyone.

This fortunate circumstance—even more than political freedom—allowed the human mind among the Greeks an independence that was a sure guarantee that its advances would be fast and go far.

But their learned men, their scientists—who soon adopted the more modest title 'philosophers', i.e. friends of science and wisdom—took on a vastly over-sized scheme of exploration and wandered around in it, lost. They aimed to get to the core of man's nature and that of the gods; of the origin of the world and of the human race. They tried to

reduce all nature to a single force and bring the phenomena of the universe under just one law. They tried to find a single rule of conduct that would cover all moral duties and the secret of true happiness.

Thus, instead of discovering truths they constructed **systems**; they neglected the observation of facts and gave themselves over to their imaginations; and being unable to support their opinions with proofs they tried to defend them by subtleties [see Glossary]. (Yet these same men did succeed in geometry and astronomy. Greece owed to them the rudiments of these sciences, and even some new truths, or at least the knowledge of truths they had brought with them from the East—not as established creeds but as theories whose principles and proofs they understood.)

Out of the darkness of those **systems** we even see two really good ideas shine out, ideas that will re-appear in more enlightened centuries.

(1) Democritus saw all the phenomena of the universe as resulting from the combinations and motions of simple bodies whose shapes couldn't be changed. These bodies, he held, were set in motion by a first shove which gave the material world an amount of force that never changes, though there may be changes in how much force is at work in any individual atom. [In that sentence, 'force' translates *action*; perhaps 'motion' would be better.]

(2) Pythagoras proclaimed that the universe was governed by a harmony, the principles of which would be revealed by the properties of numbers; which means that all natural phenomena of nature were subject to general laws that could be calculated.

In these two doctrines we readily perceive **(1)** the bold systems of Descartes and **(2)** the philosophy of Newton.

Pythagoras knew the actual lay-out of the heavenly bodies, and the true system of the world; he either discovered this by

his own meditations or got it from Egyptian or Indian priests; and he told the Greeks about it. But this system conflicted too much with the testimony of the senses—was too much at odds with the opinions of the man in the street—for the weak proofs that were then available to get much hold on the mind. So it was confined to the Pythagorean school, and was forgotten when it was forgotten, to re-appear late in the 16th century supported by better proofs that could then triumph over the clash with the senses and over a still more powerful and dangerous opponent—the prejudices of superstition.

This Pythagorean school was chiefly prevalent in the Greek colonies of coastal Italy, where it produced legislators and brave defenders of human rights; but eventually it was crushed by the tyrants, one of whom burned the Pythagoreans in their own school. It was this, no doubt, that led the survivors not to renounce philosophy or abandon the cause of the people, but to drop their now dangerous name and give up their ceremonies, which would serve only to re-awaken the rage of the enemies of liberty and of reason.

One of the main bases for all good philosophy is to create for each science a precise and accurate language, where each term represents an idea that is well determined and marked off, and to become able to determine and mark off the ideas by rigorous analysis.

The Greeks, on the other hand, exploited the defects of ordinary language

- to play on the meanings of words,
- to tangle the mind in miserable ambiguities,
- to lead it astray by making one sign mean different things at different times.

These subtleties *sharpened* men's minds while also *weakening* their ability cope with imaginary difficulties. Thus *verbal* philosophy, by filling the spaces where human reason seems to be blocked by some obstacle above its strength, didn't

immediately help it to move forward; but it prepared the way for later advances. I'll repeat this observation later on when its time comes.

·SOCRATES·

Philosophy's onward march was stopped at the outset by the philosophers' committing an error which was at that time quite excusable. Namely:

- focusing on questions that may never be answerable,
- being seduced by a project's importance or greatness, without considering whether they would have the means to carry it through;
- wanting to establish theories before collecting the facts, constructing a theoretical account of the universe when they didn't yet know how to observe it, even.

So Socrates, battling the sophists and exposing their empty subtleties to ridicule, cried out to the Greeks to *bring back to earth* this philosophy that was lost in the clouds. He didn't despise astronomy or geometry or the observation of natural phenomena; nor did he accept the childish and false idea of confining the human mind to the study of morality alone. On the contrary, the mathematical and physical sciences were indebted for their advances precisely to his school and his disciples. In plays that tried to make him look ridiculous, the biggest jokes concerned his •cultivating geometry, •studying phenomena in the sky, •making maps and •experimenting with burning-glasses—it's an odd fact that we wouldn't know how far back *they* go if it weren't for staged foolery by Aristophanes!

All Socrates wanted was to warn men to confine themselves to projects that nature has put within their reach; to be sure of every step before trying a new one; to study the space around them before leaping randomly into a space

they don't know.

His death is an important event in the history of the human mind. It is the first crime born of the war between philosophy and superstition.

The burning of the Pythagorean school had already announced the war—as old as the other and just as fierce—between philosophy and the oppressors of mankind. The two wars will continue to be waged as long as there are priests or kings on the earth, and they will loom large in the picture that I am going to draw.

The priests were *not* pleased to see men who, trying to perfect their reason and to get at the first causes of things, recognised all the absurdity of their dogmas, all the bizarreness of their ceremonies, all the fraudulence of their oracles and 'miracles'. They were afraid

- that these philosophers would pass this secret on to the disciples who attended their schools,
- that from them it would pass to all those who, for political or social reasons, had to pay some attention to improving their minds; and thus
- that the priests would soon hold sway only over the most ignorant people, and eventually even they would be undeceived.

Hypocrisy, terrified, rushed to accuse the philosophers of impiety towards the gods, so that they wouldn't have time to teach the people that those gods were the work of their priests! The philosophers thought they could escape persecution by employing—on the model of the priests themselves—a double doctrine, confiding only to a few trusted disciples doctrines that too openly offended vulgar prejudices.

But the priests told the people, regarding the simplest truths of natural philosophy, that they were blasphemies; and Anaxagoras was prosecuted for having dared to say that the sun was larger than the Peloponnese.

Socrates could not escape their punishment. Athens no longer had a Pericles to stand guard over intelligence and virtue. And anyway Socrates was guilty of more than that [i.e. more than merely being intelligent and virtuous]. His hatred for the sophists, and his zealous attempts to bring *wandering* philosophy back to projects where it could be useful, told the priests •that his only project was to find the truth, •that he didn't want to get men to adopt a new system and subject their imagination to his, but to teach them to use their own reason; and of all crimes this is what priestly pride is least able to forgive.

•PLATO•

It was at the foot of Socrates' tomb that Plato gave the lessons he had received from his master.

His enchanting style; his brilliant imagination; the conversational set-pieces, some joking and others gravely majestic; the clever and witty turns of phrase that save the philosophical discussions in his dialogues from being dry; the maxims of a mild and pure morality that he knew how to infuse into them; the skill with which he brings his people into action and keeps each in character—all those beauties that time and the revolutions of opinion haven't been able to tarnish—must have won favour for •the philosophical *dreams* that too often form the foundation of his works and •the abuse of words that his master had so much censured in the sophists but from which he couldn't preserve this first of his disciples.

When we read Plato's dialogues we're astonished at their being the work of a philosopher who placed on the door of his school an inscription forbidding anyone who hadn't studied geometry from entering; and astonished that someone who so boldly parades such empty and frivolous systems was the founder of a sect which for the first time rigorously examined

the foundations of the certainty of human knowledge, and carried rigour so far that they even cast doubt on beliefs that a more enlightened reason would have caused to be respected.

But the contradiction disappears when we consider that Plato never speaks in his own person; that in the dialogues his master Socrates always expresses himself with the modesty of doubt; that the systems exhibited there are attributed to those who were (or whom Plato thought to be) their authors; that thus these dialogues are indeed a school of pyrrhonism [see Glossary]; and that Plato knew how to display in them

the adventurous imagination of a scientist who chooses to combine and dissect splendid hypotheses combined with

the sober self-control of a philosopher who gives free play to his imagination without letting himself be bundled along by it,

the later being possible for him because his reason, armed with a healthy doubt, had the means to defend itself against even the most seductive illusions.

These schools in which the doctrine and especially the principles and method of their founders were perpetuated—though their successors were far from being slavish followers—brought the benefit of uniting in a free brotherhood men engaged in penetrating the secrets of nature. If the master's opinion was too often given a share of the authority that ought to be entirely reason's, and if in that way this institution of loosely inter-connected schools held up the advances of knowledge, still it *also* spread the fame of these schools fast and far at a time when printing was unknown and even manuscripts were rare. Their renown drew pupils from all over Greece, and they—the schools—were the most powerful means planting a liking for philosophy in that

country, and of spreading new truths.

The animosity with which rival schools fought one another led to a spirit of *sect*, and the interest of truth was often sacrificed to the success of some doctrine that each member of the sect took personal pride in. The personal passion for making converts corrupted the nobler passion for enlightening men. But at the same time this rivalry kept minds active in a useful way: the spectacle of these disputes, the sheer *interestingness* of these wars of opinion, awakened a host of men and got them interested in philosophy—men whom the mere love of truth couldn't have drawn away from their business or pleasure or even their laziness!

Because •these schools and sects, which the Greeks had the good sense never to give a role in public affairs, remained perfectly free, and because •anyone who wanted to open another school or found a new sect could do so, there was no reason to fear the enslavement of reason that utterly blocked the progress of the human mind in most other nations.

I shall show what influence the philosophers had on the Greeks' thinking, their *mœurs*, their laws and their governments. This influence must be ascribed largely to •their not having or even wanting ever to have a political role, to •nearly all these sects' having as a rule of conduct to keep away from public affairs, and lastly to •their setting themselves up as different from other men in their lives as well as their opinions.

In depicting these different sects I shall focus less on •their systems than on •the principles of their philosophy; less on •the all-too-common attempt to state precisely the absurd doctrines hidden from us by language that is now almost unintelligible than on •showing what general errors led them down those deceitful paths, and finding their origin in the natural course of the human mind.

I shall be especially careful to display the advances of the applied sciences, and the successive improvements in their methods.

In this era philosophy embraced all the sciences except for medicine, which had already been separated from it. Hippocrates' writings will show us what the state of this science was at that time, as well as of sciences naturally connected with medicine but not yet in existence except through that connection.

The mathematical sciences had been successfully cultivated in the schools of Thales and of Pythagoras. Yet in those schools they didn't get far beyond the limit at which the priestly colleges of the eastern peoples had stopped. But as soon as Plato's school began, the mathematical sciences leaped beyond the barrier that had been imposed by the idea of confining them to what is immediately useful and practical.

This philosopher, Plato, was the first who solved the problem of the duplication of the cube. . . . His early disciples discovered conic sections and determined their main properties, thereby opening up that vast field of investigation in which the human mind can exercise its powers to the end of time without reaching its borders. [The above ellipsis replaces something saying that Plato's solution, though merely mechanical, was ingenious and truly rigorous. It has since been proved that there is no rigorous solution to the problem. See 'Doubling the cube' in Wikipedia.]

The political sciences kept up their advances among the Greeks, and not solely because of philosophy. These small republics, defensively touchy about their independence and their liberty, almost all adopted the plan of entrusting to one man not the power of •making laws but the job of •formulating laws and •presenting them to the people to be examined and passed into law—or not, as the case may be—by *them*.

Thus the people gave a job to the philosopher whose virtues or wisdom had won their trust, but they gave him no authority; legislative power (as we now call it) was exercised by them, alone and unaided. This arrangement was admirably fitted to give the laws of a country the systematic unity needed for them to be sure and easy to apply, and to be long-lasting; but it was too often corrupted by the *fatal* practice of bringing superstition to the aid of political institutions. Also, politics didn't yet have any durable principles that could be relied on to prevent legislators from introducing their prejudices and their passions into these institutions.

They weren't yet capable of aiming to build—on the basis

- of reason,
- of the rights that all men have equally received from nature,
- on the maxims of universal justice

—the structure of a society of equal and free men. All they could envisage as a goal was to establish laws by which the hereditary members of an already existing society might preserve their liberty, live secure from injustice, and have enough *military* force at their disposal to guarantee their independence.

It was supposed that these laws—almost always tied to religion and consecrated by oaths—were to endure for ever; so there was less concern with *giving* a people a secure way of peacefully reforming the laws than with *blocking* any alteration [see Glossary] in the fundamental laws by preventing reforms in the details from altering the system or corrupting its spirit. They tried to form institutions that would cherish and give energy to the love of country (including love of its legislation and even its way of life); and a system of powers guaranteeing that the laws would be applied against the negligence or corruption of magistrates [see Glossary], the

undue influence of powerful citizens, and the restlessness of the multitude.

The rich, who alone were in a position to acquire knowledge, could seize the reins of authority and oppress the poor, forcing them to throw themselves into the arms of a tyrant. The ignorance and fickleness of the populace, and its resentment of powerful citizens, could *push* the state in either of two disastrous directions: **(i)** giving the powerful citizens the desire and the means of establishing an aristocratic despotism; **(ii)** weakening the state so that its ambitious neighbours could take over. Having to steer a course between these two reefs, the Greek legislators resorted to procedures that varied in how satisfactory they were but always showed the skill and wisdom that would characterise the general spirit of the nation from then onwards.

It would be hard to find in modern republics, or even in plans for them drawn up by philosophers, any institution for which the Greek republics hadn't provided the model or given an example. The Amphictyonic league, as well as the confederacies of the Etolians, the Arcadians and the Achaeans, had more or less tightly unified federal constitutions; and *with each of them* there were established a less barbaric law of nations and more liberal rules of trade *than elsewhere*, these different peoples being connected by a common origin, the same language and a similarity of *mœurs*, opinions and religious beliefs.

An intelligent and active people who cared about the public interest couldn't have failed to notice that agriculture, industry and trade were related to the state's laws and constitution, and had an effect on its prosperity, power and freedom. And thus among them we see the first traces of that big useful art now known as 'political economy'.

The mere observation of established governments was all it took for politics to become, quite early, an extensive science.

Thus in the writings even of the philosophers it is a science of facts—an empirical science, so to speak—rather than a true *theory* based on general principles that are drawn from nature and acknowledged by reason. This empirical-science approach is the point of view from which we should regard Aristotle's and Plato's political ideas if we want to understand them correctly and judge them fairly.

Almost all the Greeks' institutions presuppose **(a)** the existence of slavery and **(b)** the possibility of bringing the whole community of citizens together in one public place; and if we're to judge the effects of those institutions rightly, and especially to predict what how they were going to affect large modern nations, we ought never to lose sight of those two important differences between the Greeks and the moderns. But we can't reflect on **(a)** without realising sadly that back then even the most perfect forms of government aimed at the liberty or well-being of, at most, half the human species.

Political arrangements among the Greeks were much concerned with education. It shaped men for their country much more than for themselves or their family. This principle can be accepted only for a small population, where it is more excusable to think there's a national interest separate from the common interest of humanity. It is practicable only in countries where the hardest work in farming and in the arts is done by slaves. This education was restricted almost entirely to bodily exercises, principles of *mœurs* and customs meant to arouse narrow patriotism; the remainder was freely available in the schools of the philosophers or rhetoricians and in the artists' workshops; and this freedom was yet another cause of the Greeks' superiority.

We find in their politics, as in their philosophy, a general principle to which history provides few if any exceptions: they wanted their laws not so much to eliminate the *causes* of an evil as to destroy its *effects* by playing these causes

off against one another. They tried to take advantage of prejudices and vices, rather than dispelling or repressing them; they attended more often to ways of depriving man of his true nature, puffing him up and twisting his feelings, than to ways of refining and purifying the inclinations and desires that are the necessary result of his moral constitution. This whole wrong approach arose from the more general **error** of mistaking the man who reflects the actual state of civilisation—i.e. the man corrupted by prejudices, factional passions and social habits—for the man of nature.

What makes this an important matter, and requires us to track down the origin of this **error** so as to destroy it, is the fact that it has been passed down to our own times and still too often spoils both our morals and our politics.

If we compare the eastern nations with Greece in respect of their legislation, and especially the form and rules of their judicial procedures, we shall find that

- on one side the laws are a yoke whose force bowed the necks of slaves; on the other they are the conditions of a common compact among men;
- on one side the aim of legal forms is to ensure that the master's will is carried out; on the other, that the freedom of the citizens is not oppressed;
- on one side the law is made for those who impose it; on the other, for those who are to submit to it;
- on one side people are forced to fear the law; on the other they are taught to value it.

We find these differences again in modern nations, between the laws of enslaved peoples and the laws of free ones. In ancient Greece we shall find that man had at least a sense of his rights, even if he didn't yet know them—couldn't fathom their nature, embrace them, or grasp their full extent.

At this time of the first dim dawn of philosophy among the Greeks and their first steps in the sciences, their fine arts

were raised to a level of perfection never before known by any people and equalled by scarcely any since then. Homer lived through the time of the dissensions that accompanied the fall of the tyrants and the formation of republics. Sophocles, Euripides, Pindar, Thucydides, Demosthenes, Phidias and Apelles were all contemporaries of Socrates or of Plato.

I shall display the progress of those arts and discuss its causes; I shall distinguish what can count as a perfection of the art itself from what is to be ascribed only to the wonderful talent of the artist—a distinction that abolishes the narrow limits to which the perfecting of the fine arts has been restricted. I'll show how forms of government, systems of legislation and the spirit of religious observances have influenced the advances of the arts; I shall explore what they

owe to advances in philosophy, and what philosophy owes to them.

I shall show how liberty, arts and enlightenment helped to make *mœurs* smoother and gentler; I shall reveal that the vices of the Greeks, so often ascribed to the advances of their civilisation, were vices of rougher and cruder ages; and that enlightenment and the culture of the arts tempered them when they couldn't outright destroy them. I'll prove that the eloquent denunciations of the arts and sciences that some have made are based on a mistaken application of history, and that on the contrary the advances of virtue have always gone hand in hand with advances in knowledge, just as advances in corruption have always followed or heralded the decline of virtue.

Fifth era

Advances of the sciences from their division to their decline

Plato was still living when his disciple Aristotle opened a rival school right there in Athens.

He not only embraced all the sciences in his teaching but also applied the philosophical method to rhetoric and poetry. He had the bold thought—before anyone else did—that this method should be applied to everything that human intelligence can achieve, because this intelligence, always using the same faculties, must always to be governed by the same laws.

The larger his educational plan became, the more aware he was of the need to separate its different parts and to be precise in fixing the limits of each. From this era onwards the majority of philosophers, and even of whole sects, confined themselves to only some of those parts.

The mathematical and physical sciences constituted one large division. They were based on calculation and observation, and what they could teach has nothing to do with the opinions the sects were fighting over; so they were separated from philosophy, which these sects still dominated. So they became the study of scientists, nearly all of whom had the good sense to keep away from the disputes of the schools. Those disputes—where *reputation* was always at stake—did more for the transient fame of philosophers than for advances of philosophy itself. Before long the word 'philosophy' was reduced to referring only to the general principles of the system of the world, metaphysics, logic, and morals (including the science of politics).

Fortunately, this division of the mathematical and physical sciences from the rest occurred before the time when Greece, after long struggles, was deprived of its freedom. Those sciences took refuge in the capital of Egypt, whose despotic rulers might have turned away philosophy. Princes who owed much of their riches and power to trade stretching from the Mediterranean to the Asiatic [= Indian?] Ocean naturally encouraged sciences useful to navigation and commerce.

So these sciences escaped the speedy decline that philosophy soon underwent, its renown vanishing when liberty vanished. Roman despotism, so indifferent to advances in knowledge, didn't extend to Egypt till much later when the city of Alexandria had become necessary to Rome's survival. Already the capital city of the sciences and the centre of trade, Alexandria had all it needed to preserve their sacred flame, enabled to do this by

- its population,
- its wealth,
- the many foreigners who came there, and
- the establishments that the Ptolemies had established and the conquerors never thought of destroying.

The Academic [= Platonic] sect, which had cultivated mathematics from its outset and had confined its philosophical instruction almost entirely to proving the value of doubt and showing the narrow limits of certainty, was bound to be the sect of scientists; and this doctrine about doubt and certainty couldn't alarm the despots, so it became dominant in the school of Alexandria.

The previously narrow scope of geometry was extended by the theory of conic sections, and its uses in constructing geometrical loci and solving problems, and by the discovery of some other curves.

•ARCHIMEDES•

Archimedes discovered the quadrature of the parabola [look it up in Wikipedia] and measured the surface of the sphere. These were the first steps in the theory of *limits* that determines the ultimate value of a quantity, i.e. the value which—in an infinite progression—it always approaches but never reaches. This science shows how to determine the ratios of vanishingly small quantities, and to get from those the ratios of finite quantities [= 'quantities that are more than infinitesimal']; it is, in short, the calculus that the moderns, with more pride than justice, have termed 'the infinitesimal calculus' and attributed to Newton and Leibniz. It was Archimedes who first determined the approximate ratio of the diameter of a circle to its circumference, showed how we can get approximations that are closer and closer, and made known the *method of approximation*—that wonderful addition to the small stock of known methods and often an enrichment of the science itself.

We could in a way regard him as the father of rational mechanics. We owe the theory of the lever to him, as well as the discovery of the principle of hydrostatics that a body immersed in liquid loses a portion of its weight equal to the weight of the fluid it has displaced.

His talents in the science of mechanics—which scientists had neglected because not enough of the relevant theory was known for it to be managed—are shown by the screw that bears his name, his burning glasses, and the wonders he worked in the siege of Syracuse. These great discoveries, these new sciences, make Archimedes one of those happy geniuses whose life forms an era in human history, and whose existence appears as one of nature's gifts. [Syracuse was Archimedes' home. When he was in his 70s Rome destroyed Syracuse after a long and costly siege, made hard for them partly by ingenious defensive devices he had invented.]

It is in the school of Alexandria that we find the first traces of **algebra**, i.e. of the calculation of quantities considered simply as such. The nature of the problems proposed and resolved in Diophantus's book required numbers to be considered as having a general indeterminate value, and subject only to certain conditions. But this science didn't have then, as it does today, its own special signs, methods and technical operations. The general value of quantities was indicated by words; and it was only through a series of reasonings—not through calculations—that the solutions of problems were discovered and developed.

Some observations by the Chaldeans, sent back to Aristotle by Alexander, sped up the advances of **astronomy**. The most brilliant upshot of them was due to the genius of Hipparchus. And although, after him in astronomy as after Archimedes in geometry and mechanics, there have been no more of those discoveries and inventions that change the whole face of a science, those sciences did for a long time continue to be improved, expanded, and enriched at least in the details.

In his **natural history of animals**, Aristotle had given the principles and a valuable model for •precisely observing and systematically describing the objects of nature, for •classifying those observations and •grasping the general results they exhibited. The natural histories of plants and of minerals were treated after his time, but less precisely and from a narrower and less philosophical standpoint.

Anatomy progressed very slowly, not only because religious prejudices condemned the dissection of corpses but also because vulgar opinion thought that even touching them was a sort of moral defilement.

Hippocrates' **medicine** was merely a science of observation which hadn't yet been able to generate anything but empirical methods. The spirit of *sect* and the love of

hypotheses soon infected it, making it more than merely empirical. The upshot was more errors than new truths; the •sectarian• prejudices or •hypothetical• systems of the physicians did more harm than their observations could do good; but it can't be denied that during this era medicine made small but real advances.

Aristotle didn't bring to **physics** either the accuracy or the wise caution that characterise his natural history of animals. He paid tribute to the customs of his times and the spirit of the schools by disfiguring his physics with hypothetical principles whose vague generality enables them to explain everything with a sort of ease because they can't explain anything with precision.

Anyway, observation alone was not enough; experiments were needed. These required instruments; and it appears that back then men hadn't collected enough facts and examined them in enough detail to feel the need—indeed to conceive the idea—of this •experimental• mode of questioning nature and forcing it to answer.

Also, the history of the advances of physics in this era is confined to a very few items of knowledge that were acquired by chance, observations made in the practice of the arts, rather than from the researches of the scientists. Hydraulics, and especially optics, yield a somewhat richer harvest, but it consists more of •facts that were noticed because they *presented* themselves than of •theories or physical laws discovered by experiments or reached by thinking.

Agriculture had previously been confined to simple routine and a few regulations that priests had corrupted with their superstition when transmitting them to the people. •In this fifth era• agriculture became, with the Greeks and still more with the Romans, an important and respected art whose usages and precepts were eagerly collected by the most knowledgeable men. When these were precisely

described and judiciously arranged, they could enlighten practical farming and spread useful methods; but the age of experiment and planned observations was still very far off.

The mechanical arts began to be linked with the sciences. Philosophers examined the procedures they involved, researched into their origins, studied their history, and occupied themselves with describing the processes and products of arts as practised in various territories, collecting these observations, and transmitting them to posterity.

Thus Pliny includes •man, •nature and •the arts in the enormous plan of his natural history—a valuable inventory of everything that then constituted the true riches of the human mind; and his claim to our gratitude can't be cancelled by the justified complaint that he collected with too little discrimination and too much credulity everything that the ignorance or lying vanity of historians and travellers fed to his insatiable appetite for knowing everything.

Athens in the days of its power had honoured philosophy and letters; when Greece was declining there was a debt the other way—Athens owed to philosophy and letters the preservation for a while longer of some vestiges of its ancient splendour. Athens was no longer the tribunal at which the destinies of Greece and Asia were decided; but it was in the Athenian schools that the Romans learned the secrets of eloquence; and it was at the base of Demosthenes' lamp that the first of their orators was formed.

The Academy, the Lyceum, the Portico (in Athens) where the Stoics taught, and the gardens of Epicurus were the nursery and principal school of the four sects that disputed the domain of philosophy.

•THE ACADEMY (following Plato)•

In the Academy they taught that nothing is certain; that man can't attain absolute certainty about any topic, or even

complete understanding of it; and they took this out to the extreme, maintaining that man couldn't be sure even of this impossibility of knowing anything, and that even the necessity of doubting everything should be doubted.

The opinions of other philosophers were expounded, defended and attacked in this school, but merely as hypotheses to provide mental exercise and—through the uncertainty that accompanied these disputes—to intensify the students' sense of the futility of human 'knowledge' and the absurdity of the other sects' dogmatic confidence.

This doctrine, when it leads to

- not reasoning on words to which we can't assign clear and precise ideas,
- keeping our acceptance of propositions in line with their probabilities, and
- settling the scope of the certainty we can have with each species of knowledge,

is something that reason itself proclaims. But when it extends to demonstrated truths, and attacks the principles of morality, it becomes either stupidity or insanity; and that is the extreme that the sophists went to—the ones who came after Plato's first disciples in the Academy.

I shall follow the steps of these sceptics and exhibit the cause of their errors. I'll search for the element of their extravagant doctrine that is due to the passion for distinguishing oneself by bizarre opinions; and I'll show that although they were flatly opposed by other men's instincts and by the instincts that the sceptics themselves steered by in their daily lives, they weren't properly refuted or even properly understood by the philosophers of their time.

But this extravagant scepticism hadn't possessed the whole sect of academics. The doctrine of an eternal idea of what is just, fine and honest—an idea that

- is independent of human interests and conventions, and even of human existence, and,
- imprinted on our soul, became our principle of duty and the law of our actions

—this doctrine, derived from Plato’s dialogues, was still inculcated in his school as the basis of moral teaching.

·THE LYCEUM (following Aristotle)·

Aristotle was no better skilled than his masters in the art of analysing ideas, i.e. of working back from a complex idea to the simpler ideas making it up, and of observing the origin of these simple ideas themselves, doing these things in step with the movement of the mind and the development of its faculties. So his metaphysic, like those of the other philosophers, was nothing but a vague doctrine based partly on the misuse of words and partly on mere guesswork.

Yet it is to him that we owe the important truth—the first step in the science of the human mind—that our ideas, even such as are most abstract (most purely ‘intellectual’, so to speak) owe their origin to our sensations. But he provided no support for this. It was •the intuitive perception of a man of genius rather than •the upshot of a series of observations accurately analysed and then combined so as to generate a general truth. So this seed, thrown onto barren ground, took more than twenty centuries to produce a harvest.

Aristotle in his logic, having •reduced all demonstrations to a series of arguments in syllogistic form, and then •divided all propositions into four classes, shows us how to recognise among all possible triplets of propositions of these four classes the ones that express conclusively valid syllogisms. In this way we can judge whether an argument is valid solely by knowing what kind of triplet it belongs to; so the art of sound reasoning is somewhat subjected to technical rules.

This ingenious idea has been useless until now; but it may become the first step towards a completion that the art of reasoning and discussion seems still to need.

According to Aristotle, every virtue is placed between two vices, of which one is the lack of it and the other an excess of it. A virtue is, in a way, merely a natural inclination that reason tells us not to resist too strongly or obey too slavishly.

This general principle could have been suggested to him by one of those vague ideas of order and conformity that were so common in philosophy at that time; but he defended it in a less vague and general way by stating it in terms of Greek words for the virtues.

At about the same time two new sects, basing their systems of morality on principles that at least appeared to be contrary, divided thinkers into two camps, extended their influence far beyond their schools, and sped up the collapse of Greek superstition; but unfortunately a gloomier and more dangerous superstition—one more hostile to enlightenment—was soon to take its place.

·THE PORTICO (the Stoics)·

The Stoics held that virtue and happiness consist in the possession of a soul that

- feels neither pleasure nor pain,
- is free from all the passions,
- is superior to every fear and every weakness,
- knows no true good but virtue and no real evil but a guilty conscience.

They believed that a man could raise himself to this level if he strongly and constantly wanted to, and that then— independent of fortune and always master of himself—he’ll be out of the reach both of vice and of misfortune.

A single mind animates the world: it may be the only thing that exists, but if it isn’t then it’s at least present

everywhere. The souls of human beings are emanations of it. The soul of a wise man who hasn't defiled the purity of his origin is re-united with this universal mind at the moment of death. So death would be a blessing for the sage if it weren't for the fact that for him—a follower of nature who is hardened against all the so-called 'evils'—it is even finer to regard death as neither good nor bad.

·THE GARDENS (Epicurus)·

Epicurus equates happiness with the enjoyment of pleasure and freedom from pain. Virtue consists in following one's natural inclinations while knowing how to purify and direct them. The road to both happiness and virtue runs through temperance, which prevents pain and (by preserving our faculties in their full force) secures all the enjoyments that nature provides for us; and through the care

- to guard ourselves against hostile or violent passions that torment and tear the heart that surrenders to their bitterness and fury,
- to cultivate instead the gentle and tender affections,
- to moderate the pleasure that comes from having acted beneficently,
- to keep one's soul pure, so as to avoid the shame and feelings of guilt that punish bad actions, and enjoy the lovely feeling that rewards good ones.

Epicurus saw the universe as merely a collection of atoms whose various combinations acted according to necessary laws. The human soul was itself one of those combinations. The atoms that composed it came together when the body came alive, and scattered at the moment of death, to re-unite with the common mass and enter into new combinations.

Not wanting to shock popular [see Glossary] prejudices too directly, he had admitted gods into his universe; but they were a kind of after-thought—they were indifferent to the

actions of men, had no role in the order of the universe, and were governed like everything else by the general laws of its mechanism.

Hard, proud, mean men hid behind the mask of Stoicism. Voluptuous and corrupt men often glided into the gardens of Epicurus. Some people condemned the principles of the Epicureans, accusing them of regarding the gratification of sensual appetites as the highest good. Others ridiculed the claim of the sage Zeno of Citium, the founder of Stoicism that he wouldn't be less happy, free and independent if he were a slave at the mill or tormented by gout. [The original implies that Zeno *was* a slave at the mill or tormented by gout; but that was presumably a slip.]

The Stoic philosophy that claimed to rise above nature, with a morality that acknowledged no good except virtue, and the Epicurean one that wanted only to obey nature, and with a morality that equated happiness with sensual pleasure—these two led to the same practical consequences, though they started from such opposite principles and were expressed in such contrary languages. This resemblance among the moral precepts of all religious systems and all philosophical sects would be sufficient to prove that the truth of these precepts doesn't depend on religious dogmas or sectarian principles; that the basis of man's duties and the origin of his ideas of justice and virtue must be sought in *his moral constitution*. The Epicureans came closer to this truth than any other sect did; and this may have done more than anything else to earn for them the enmity of hypocrites of all kinds for whom morality is merely a *commodity* that they are fighting for control of.

The fall of the Greek republics brought the fall of the political sciences. After Plato, Aristotle and Xenophon they almost ceased to be included in the system of philosophy.

·ROME·

Now for an event that changed the fate of a considerable part of the world, and influenced the advances of the human mind in ways that are still felt today.

The city of Rome had extended its empire over every nation in which human intelligence had risen above the weakness of its earliest infancy—except India and China.

It gave laws to every country to which the Greeks had taken their language, their sciences and their philosophy. These peoples, held by a chain that their defeat had fastened to the base of the capitol, no longer existed except by the will of Rome and for the passions of the Roman leaders.

My plan for the present work includes depicting accurately the constitution of this dominating city. In it we'll see

- the origin of hereditary patrician rank, and the ingenious means by which it was made stabler and stronger by being made less odious;
- a people
 - accustomed to weapons but never using them in internal quarrels,
 - combining real power with lawful authority, yet
 - scarcely defending itself against a haughty senate that chained it down by superstition while dazzling it with the splendour of its victories;
- a great nation, the plaything of its tyrants and of its defenders, and through four centuries the passive dupe of an absurd but sacrosanct electoral system.

We'll see how this constitution, made for a single city, changed its nature but not its form when it had to be extended to a great empire. This empire could maintain itself only by continual wars, and before long was destroyed by its own armies. Eventually the sovereign people, debased by the habit of being fed at the expense of the public treasury, and corrupted by hand-outs from the senators, *sold to one*

man the illusory ruins of its useless freedom.

The Romans' ambition led them to look to Greece for masters in the art of rhetoric, which in Rome was one of the roads to fortune. The taste for exclusive and refined enjoyments—the need for new pleasures—that springs from wealth and idleness made them look to the arts of the Greeks and even to the conversation of their philosophers. But the sciences and philosophy were plants foreign to the soil of Rome, as were the graphic arts. The greed of the conquerors covered Italy with masterpieces of Greece, taken by violence from the temples and cities of which they had been ornaments, consoling an enslaved people; but they never dared to set up any Roman works alongside them! Cicero, Lucretius and Seneca wrote eloquently on philosophy in their own language, but the philosophy in question was Greek. When Caesar wanted to reform Numa's primitive calendar he had to employ a mathematician from Alexandria.

Rome, long torn by the factions of ambitious generals, busy with new conquests or agitated by civil discords, eventually fell from its **(i)** restless liberty into a **(ii)** stormy military despotism. Where were the calm meditations of philosophy and the sciences to find a place **(i)** among captains who aspired to be tyrants or, a bit later, **(ii)** under despots who feared the truth and hated talents and virtue equally? Anyway, the sciences and philosophy are bound to be neglected in any country where naturally studious folk have open to them an honourable career leading to wealth and dignities—and in Rome the law provided such a career.

When laws are tied to religion, as they are in the east, the right of interpreting them becomes one of the strongest supports of priestly tyranny. In Greece the laws of each city had been part of the code given to the city by its legislator, who had tied them to the spirit of the constitution and the government that he had established. [That sentence could have

read ‘*which* had tied’ and ‘that *it* had established’; nothing in the French requires that the ‘legislator’ was a person rather than a collective of some kind.] They went through few changes. The magistrates often abused them; there were many individual injustices; but the vices of the laws never led in Greece to a regular and coldly calculated system of robbery. In Rome—

- where for a long time the only known authority was the tradition of customs,
- where the judges announced each year what principles they would follow in settling disputes during their time in office,
- where the first written laws were a compilation from the Greek laws, drawn up by a committee—the ‘decemvirs’ [= ‘ten men’]—whose members were more anxious to *preserve* their power than to *honour* it by presenting good legislation,
- where, after that era, laws dictated by the party of the senate alternated rapidly with laws dictated by the party of the people, so that they were incessantly destroyed or confirmed, improved or worsened, by changes in the political situation,

—the laws soon became so numerous, complicated, and obscure. . . .that knowledge of them and research into them became a separate science. [The ellipsis in that sentence replaces *suite nécessaire du changement de la langue* = ‘inevitable result of the change of language’; perhaps referring to the fluidity of languages in general or of Latin in particular, or perhaps to the switch from Greek to Latin.] The senate, profiting from the people’s respect for the old institutions, soon picked up that the privilege of interpreting laws was nearly equivalent to the right to make new ones; and accordingly this body was packed with legal experts. *Their* power outlived that of the senate itself; it grew under the emperors, because the weirder and more uncertain the laws are, the more power the lawyers have.

So jurisprudence is the only new science that we owe to the Romans. I shall trace its history, because it is connected with the history of the advances—and especially of the obstacles to the advances—that the science of legislation has made among the moderns.

I shall show how •respect for the positive [see Glossary] law of the Romans helped to preserve some ideas of the natural law of men, but then went on to prevent these ideas from increasing and spreading; and how •we owe to Roman law a few useful truths and many tyrannical prejudices.

The mildness of the penal laws under the republic is worth our notice. They had, in a way, made the blood of a Roman citizen sacrosanct. He couldn’t be sentenced to death except by bringing into play a special power that announced ‘public calamities’ and ‘danger to the country’. The whole body of the people could be brought in to judge between one man and the republic. It had been thought that for a free people this mildness was the only way to prevent political dissensions from degenerating into bloody massacres; the aim had been for the humaneness of the laws to correct the ferocious *mœurs* of a populace that freely spilled the blood of its slaves, even in its entertainments. Accordingly, up to the time of the Gracchi [towards the end of the second century BCE] there was no country where so many violent and frequent disturbances cost so little blood or produced so few crimes.

We don’t now have any work of the Romans about politics. Cicero’s work on the laws was probably just a polished extract from books by Greeks. Social science couldn’t be established and perfected amidst the convulsions of expiring liberty. Under the despotism of the Caesars the study of it would have been seen by the despots as nothing but a conspiracy against their power. The best evidence of how ignorant the Romans were of this science is the following fact. •There was an uninterrupted succession—unique in

all history—from Nerva to Marcus Aurelius of five emperors who all had virtue, talents, knowledge, a love of glory, and zeal for the public welfare; and yet •none of them produced a single institution that would mark the desire to set limits to despotism, prevent revolutions, and cement by new ties the parts of that huge mass, •the Roman Empire•, whose imminent dissolution was everywhere apparent.

The union of so many peoples under one sovereignty, and the spread of the two languages that divided the empire between them and were both known by nearly every educated man—these causes could be expected to contribute jointly to the more equal diffusion of enlightenment over a greater area. Another natural effect would have been to gradually lessen the differences amongst the philosophical sects, and to unite them into one •eclectic• philosophy, •i.e. one• that would select from each sect those of its doctrines as were most in conformity with reason, best confirmed by sober reflection. This was the point to which reason might be expected to bring philosophers when it alone could be heard because time had quietened the passionate clamour of the sects. And we do find already, in Seneca, marks of this philosophy; indeed it was never alien to the sect of the academics, which seemed to become entirely mixed up with it; and the last of Plato's disciples were the founders of eclecticism.

•RELIGIONS•

Almost every religion of the empire had belonged to one of the conquered nations; but they had strong resemblances—a kind of family likeness. In *all* of them:

- no metaphysical doctrines;
- many weird ceremonies whose meaning was unknown to the people and often even to the priests;
- an absurd mythology which the multitude saw as the marvellous history of its gods, while better educated

men suspected it to be an allegory of something more uplifting;

- bloody sacrifices;
- idols representing gods, some of them—consecrated by time—acquiring celestial powers themselves;
- priests devoted to the worship of each divinity, but without coming together to form a political body or even a religious community;
- oracles attached to certain temples and certain statues; and lastly,
- mysteries, which their presiding priests never revealed without imposing an inviolable law of secrecy.

These were the features of resemblance •among the different religions in this era•.

I should add that the priests, arbiters of the religious conscience, never ventured to make claims on the moral conscience; that they directed the conduct of worship but not the actions of private life. They sold oracles and auguries to political powers; they could launch whole peoples into wars, and order them to commit crimes; but they exercised no influence over the government or the laws.

When the different peoples as subjects of a single empire came to be habitually in communication with each other, and advances in knowledge were nearly equal everywhere, educated people soon saw that all these •religious• cults were worshipping just *one* god—that the numerous divinities to which popular adoration was immediately addressed were merely versions of, or ministers [here = 'intermediaries'] of, a single god.

But among the Gauls and in some provinces in the east the Romans had found religions of another kind. There the priests *were* the judges of morality: virtue consisted in obedience to a god of whom they were, they said, the sole interpreters. Their power extended over the whole

man; the temple wasn't properly distinguished from the country; a man's status as a worshipper of Jehovah or *Æsus* outranked his status as a citizen or subject of the empire; and the priests decided which human laws their god allowed men to obey. [You might think that *Æsus* is Jesus, but there is no warrant for that translation; and Condorcet's topic here is religions of Gaul as well as of the east. The present translator is defeated.]

These religions were bound to offend the pride of the masters of the world. That of the Gauls was too powerful for the Romans not to seek its immediate destruction. As for the Jewish one: the nation itself was scattered; but the ·Roman· government's vigilance didn't bother to reach—or else *couldn't* reach—the obscure sects that were secretly formed out of the ruins of the old systems of worship.

One benefit of the spread of Greek philosophy had been to destroy belief in popular divinities in all classes of men who had had more than a bare minimum of education. A vague theism or the pure mechanism of Epicurus was, as early as Cicero's time, the common doctrine of everyone who had cultivated his mind and ·thus· of all those who were directing public affairs. This class of men was necessarily attached to the old religion; but they tried purify it, because the credulity of even the common people had been exhausted by all those gods from different countries. So philosophers constructed systems based on *intermediary spirits*, subjecting themselves to preparatory observances, rites and a religious discipline, to become more worthy of approaching these superior intelligences; and they looked to Plato's dialogues for the foundations of this doctrine.

The people of the conquered nations—the unfortunate ones, men with weak but yearning imaginations—were bound to prefer the priestly religions, because the self-interest of the ruling priests 'inspired' them to preach the doctrine of

- equality in slavery,
- renunciation of worldly goods, and
- rewards in heaven awaiting those who blindly submit, who suffer, who undergo humiliations inflicted by themselves or endured without complaining

—that doctrine so attractive to oppressed humanity! But they needed to refine their crude mythology by metaphysical subtleties, and for these they looked again to Plato. His dialogues were the arsenal that the two opposing parties went to for theological weaponry. Later on we'll see Aristotle obtaining a similar honour, and becoming at once the master of the theologians and the leader of the atheists.

·CHRISTIANITY·

Twenty Egyptian and Jewish sects combined against the religion of the empire, but fought each other with equal fury and were eventually absorbed into the religion of Jesus. From their ruins were composed a history, a creed, rituals and a system of morality, to which the mass of these 'inspired' folk gradually attached themselves.

They all believed in a Christ [see Glossary], a Messiah, sent from God to restore the human race. This was the fundamental dogma of every sect that tried to raise itself on the ruins of the previous ones. They didn't agree about when and where he would appear or about his earthly name; but the name of a prophet who was said to have appeared in Palestine during the reign of Tiberius eclipsed all the other candidates for the role of Messiah—and the new fanatics rallied under the standard of the son of Mary.

The more the empire weakened, the faster this christian religion advanced. The degraded state of the former conquerors of the world spread to their gods, who had presided over the Romans' victories and were now merely the impotent witnesses of their defeats. The spirit of the new sect was

better suited to a time of decline and misery than to any other. Its leaders, in spite of their impostures and their vices, were genuine fanatics who were ready to die for their doctrine. The religious zeal of the philosophers and of the great men was a merely political devotion; and any religion that men permit themselves to defend as 'a creed that it's useful to leave to the people' can't look forward to anything but more or less prolonged death-throes. Christianity soon became a powerful party; it mixed in with the quarrels of the Caesars; it put Constantine on the throne, and then put itself there alongside his weak successors.

The emperor Julian, one of those extraordinary men whom chance sometimes exalts to sovereign power, tried to free the empire from this christian plague that was sure to hasten its fall; but in vain. His virtues, his indulgent humanity, the simplicity of his *mœurs*, the elevatedness of his soul and his character, his talents, his courage, his military genius, the splendour of his victories—all this seemed to promise him success. (The only reproach he was open to was his attachment to a religion—the ancient Greek religion—which had become ridiculous. If this attachment was sincere it was unworthy of him, and if it was merely political its bizarreness made it clumsy.) But he died at the height of his glory, after a reign of two years. The colossus of the Roman empire no longer had arms strong enough to hold it up; and Julian's death broke the only dyke that could still have held against the torrent of new superstitions and the floods of barbarians.

THE SCIENCES

Contempt for the human sciences was one of the first features of christianity. It had to avenge itself for philosophy's outrages; it feared that spirit of investigation and doubt, that confidence in one's own reason, which is the scourge of all

religious creeds. Even knowledge of the natural sciences was odious to it, because those sciences are dangerous to the success of miracles; and there's no religion that doesn't require its devotees to swallow some physical absurdities. So christianity's triumph signalled the total downfall of the sciences and of philosophy.

If the art of printing had been known, the sciences could have held their ground; but there were few manuscripts of any one book; and to procure anything like a complete scientific library required trouble, often journeys, and expense that only the rich could afford. It was easy for the ruling party to make *disappear* any books that collided with its prejudices or unmasked its impostures. A barbarian invasion could in a single day deprive a whole country, for ever, of the means of learning. The destruction of a single manuscript was often an irreparable loss for an entire region. Besides, only works by known authors were copied. All those investigations that can be important only when they are assembled, those isolated observations and fillings-in of details that serve to keep the sciences from slipping back and prepare their future advances, those materials that time amasses and that await a genius to make something of them—all these were condemned to stay in the dark for ever. The working-together of scientists, the combination of all their forces that is so advantageous—indispensable, indeed, in certain eras—didn't exist. Any discovery required one individual to start it and carry it through, fighting unaided nature's obstacles to our efforts. Works that

- facilitate the study of the sciences,
- clarify their difficulties, and
- present
 - their truths in simpler and more manageable forms,
 - details of observations, and

- developments that show up errors in results, enabling the reader to grasp what the author himself had missed

—such works, if they had existed back then, would have found neither copyists nor readers.

So it was impossible for the sciences—which had already reached an extent that made it hard to advance them or even to study them thoroughly—to support themselves and resist the slope that was leading them swiftly to their decline. It is no surprise, then, that christianity was able at this time to accomplish their ruin, whereas later on, after the invention of printing, it hadn't the strength to prevent them from re-appearing in splendour.

·LANGUAGE AND LITERATURE·

The Greeks' language and literature retained their splendour for a long time. (I except from this •the dramatic art, which flourished only in Athens and inevitably fell when Athens fell, and •eloquence, which can breathe only in a free air.) ·The Greek writers· Lucian and Plutarch would not have disfigured the age of Alexander ·four centuries earlier·. Rome, it is true, rose to Greece's level in poetry, eloquence, history, and the art of treating the dry topics of philosophy and the sciences with dignity, elegance and charm. Greece itself had no poet who made the reader think 'perfection!' as fully as Virgil did, and had no historian to equal Tacitus. But this moment of splendour ·for the Latin language· was quickly followed by decline. After Lucian the Roman writers were all close to being barbarous. Chrysostom still speaks the language of Demosthenes. We don't see Cicero's or Livy's language in Augustine, or even in Jerome, who couldn't excuse himself with the plea—which Augustine might have used—of the influence of African barbarity.

The point is that in Rome the study of letters and love of

the arts were never the real taste of the people; the transient perfection of its language was the work not of the national genius but of a few men who had been shaped by Greece. Roman territory was always a foreign soil for literature; intense cultivation had been able to make the literary arts grow there, but they were bound to wither as soon as they were left to themselves.

The importance that Greece and Rome for so long attached to the tribune and the bar—i.e. to judging and legal pleading—increased their numbers of orators. Their labours contributed to the progress of the art ·of rhetoric·, developing its principles and its subtleties. But they taught another art that the moderns have too much neglected, and which these days would have to be carried over from spoken works to printed ones. I mean the art of

- composing, quickly and easily, speeches in which the layout of the parts, the over-all method, and the ornaments are all at least tolerable; of

- being able to speak almost impromptu without wearying the hearers by putting one's ideas in a jumble or being long-winded; without disgusting them by wild declamations, gross nonsense or weird changes of tone or content.

In any country where the functions of office, public duty, or private interest may require a man to speak or write without having time to think about his speech or composition, how useful this art would be! The history of this art deserves our attention all the more because the moderns, who often really *need* it, seem to have been aware only of its comic aspects.

From the start of this fifth era (which I have nearly finished with), there were growing numbers of books; but the passage of time had spread so many obscurities over the works of the chief Greek writers that *erudition*—the study of books and opinions—came to constitute an important

intellectual occupation; and the library at Alexandria was full of grammarians and textual critics.

In what has come down to us of their output, we see in these critics a tendency

- to proportion their level of confidence in, or admiration of, a book to its antiquity, how hard it is to understand, and how hard it is to find a copy;
- to judge opinions not on their merits but on the strength of who first came up with them; and
- to base their belief on authority rather than on reason;

and we also see in them

- the false and destructive idea of the deterioration of the human race and the superiority of ancient times.

This last error, of which learned men always everywhere have been more or less guilty, can be explained by—and excused by—the importance men give to whatever they have focused on and put energy into.

The Greek and Roman scholars, and even their scientists and philosophers, can be reproached for their total lack of the spirit of *doubt* that submits factual claims and the evidence for them to severe rational scrutiny. In reading their accounts of the history of events or of *mœurs*, of the productions and phenomena of nature, or of the works and methods of the arts, we are astonished to see them calmly reporting the most palpable absurdities, and the most revolting ‘miracles’. They seemed to think they could escape being ridiculed for puerile credulity by starting sentences with ‘They say . . .’ or ‘It is reported . . .’. This indifference to

whether what they were writing was true or not spoiled their study of history and was an obstacle to their making any advances in the knowledge of nature; it is mainly due to the misfortune of their not yet knowing the art of printing. The certainty of our having collected all the authorities for and against a given factual claim, and ease in comparing the different testimonies and learning from the discussions that arise from those differences—these means of ascertaining truth can exist only when a great many books are available, copies of them can be indefinitely multiplied, and there’s no reason to fear giving them too wide a circulation.

Travellers’ tales, descriptions of which there was often only a single copy and which weren’t subjected to public judgment—how could they acquire the *authority* that is ultimately based on the item’s not having been contradicted given that it *could* have been contradicted? So everything was recorded because it was hard to make confident choices about what was worth recording. But we have no right to astonishment at this practice of being equally confident of the most miraculous supposed events and utterly natural events because the ‘authorities’ for both are equal. This error is still taught in our schools as a principle of philosophy, while in the opposite direction an exaggerated incredulity leads us to reject without examination everything that strikes us as unnatural; and the only science that can show us the point where reason directs us to stop between these two extremes has only just begun to exist.

Sixth era

Decline of learning up to its restoration at about the time of the crusades

[The crusades spread across most of the 12th and 13th centuries. They are mentioned early in the next chapter (on the seventh era); Condorcet's line between the sixth and seventh eras is notably vague.]

In this disastrous era we shall see the human mind rapidly descending from the height to which it had raised itself, while ignorance brings with it

ferocity here, refined cruelty there, corruption and treachery everywhere.

Some glimmerings of talent, some faint sparks of magnanimity or goodness, barely show through this dark night. Men's intellects are given over to theological day-dreams and superstitious fraud, and their only morality consists in religious intolerance. Europe, crushed between priestly tyranny and military despotism, awaits in blood and in tears the moment when new enlightenment will restore it to liberty, humanity and the virtues.

I shall divide the picture into two distinct parts. The first will cover the West, where the decline was faster and more complete, but where the light of reason would later re-appear, never again to be extinguished. The second will cover the East, where the decline was slower and for a long time less total, but which *still* hasn't experienced the moment where reason can enlighten it and break its chains. [We'll see in due course that he divided it into *three* distinct parts.]

[A] In the West

Christian piety had scarcely overthrown the altar of victory when the West became the prey of barbarians. They embraced the new religion, but didn't adopt the language

of the vanquished [i.e. didn't adopt Latin]. Only the priests retained it; but because of their ignorance and contempt for literature, what might have been expected from the reading of Latin books—which only they could read—didn't make its appearance.

·THE END OF SLAVERY·

The ignorance and barbarous *mœurs* of the conquerors are well enough known; yet this dull-witted ferocity led to the abolition of domestic slavery—a slavery that had disgraced the best days of learned, free Greece. ·There were three reasons for this·.

(i) The serfs of the fields cultivated the conquerors' lands. This oppressed class supplied their houses with domestics, whose dependent situation answered all the purposes of the conquerors' pride and their caprices. Accordingly, the object of their wars was not slaves but land and people to work it.

(ii) Also, a high proportion of the slaves the victors found in the territories they invaded were either prisoners taken from tribes of their own victorious nation or else the children of such prisoners. At the moment of conquest many of these slaves ran away or enlisted in the conquering army.

(iii) Lastly, the principles of universal brotherhood—which were a part of christian morality—condemned slavery; the priests had no political reason to contradict on this topic maxims that did honour to their cause; so their sermons contributed to a downfall ·of slavery· that events and *mœurs* would certainly have brought about anyway.

This change—the downfall of slavery—has been the seed of a revolution in the destinies of mankind; it has enabled

men to know true liberty. But its influence on the lives of individuals was at first hardly noticeable. We would have a very false idea of slavery among the ancients if we likened it to that of our Blacks. The Spartans, the nobles in Rome, and the local governors in the East were indeed barbarous masters and comparable with today's owners of African slaves. The full cruelty of greed drove the work of slaves in the mines. But they were an exception. Almost everywhere the masters' self-interest had softened the state of slavery in individual families. . . . The serf was almost as dependent as the slave had been, but didn't have the compensation of the care and support received by the slave. He was less continuously under the eye of his master than the slave had been, but was treated with a more lordly arrogance. The slave was a man whom bad luck had reduced to a condition to which the fortunes of war might one day reduce his master. The serf belonged to a lower, degraded class.

In thinking about this annihilation of domestic slavery, we must therefore look mainly to its remote consequences rather than to what it was like *then* for the liberated slaves.

These barbarian nations all had pretty much the same form of government:

- a common chief, called 'king', who with a council pronounced judgments and gave decisions that couldn't safely be delayed;
- an assembly of special chieftains, consulted on all resolutions that had some importance; and lastly
- an assembly of the people, for the discussion of measures that concerned the people as a whole.

Where governments differed, it was mainly in how much authority they gave to each of these three powers. The three were marked off not by the nature of their functions but by nature of the affairs they dealt with, and especially by how those affairs affected the interests of the mass of the citizens.

[In this paragraph, the 'peoples' in question are the conquerors, not the conquered.] With agricultural peoples—and especially those who had already established a settlement on a foreign territory—these constitutions had taken more regular and more solid form than with pastoral peoples. Also, the agricultural people were scattered across the territory rather than clumped into encampments of various sizes. So the king didn't always have an army assembled around him; and conquest couldn't lead almost immediately to despotism, as it did in the upheavals in Asia.

Thus the vanquished nation was not enslaved [taking *victorieuse* to be a slip for *vaincue*]. At the same time, these conquerors preserved the towns but didn't themselves live in them. Not being constrained by an armed force, because much of the time there wasn't one, these towns acquired a sort of power; and this was a rallying point [French: **point d'appui**] for the liberty of the conquered nation.

•THE SPECIAL CASE OF ITALY•

Italy was often invaded by the barbarians; but they couldn't settle down there because Italy's wealth kept arousing the greed of new conquerors, and because for a long time the Greeks hoped to bring Italy into *their* empire. It was never completely or permanently subdued by any people. Latin (the only language of the people there) degenerated more slowly, ignorance was less complete, superstition less stupid, than elsewhere in the West.

Rome, which acknowledged masters only to change them, retained a sort of independence. It was the residence of the head of the religion, the pope. Accordingly, whereas

in the East, where there was a single ruler at any one time, the clergy, sometimes governing the emperors and sometimes conspiring against them, supported despotism even when resisting the despot; and preferred steering the

whole power of an absolute master so that it served their purposes to •quarrelling with him in an attempt to get some of it for themselves;

•in the West we see the priests, united under a common head, setting up a power to rival the power of the kings, and forming in these divided states a single independent monarchy of a certain kind.

·THE VERY SPECIAL CASE OF ROME·

I shall exhibit this overbearing city trying out on the world the chains of a new kind of tyranny, in which its popes

- preyed on credulity by crudely forged documents;
- mixed religion into all the transactions of everyday civil life, so as to make them better serve their greed or their pride;
- punished by anathemas [see Glossary], from which the people shrank with horror, the least opposition to their laws, the least resistance to their crazy claims;
- had in each State an army of lying monks who were always ready to intensify the terrors of superstition so as to increase the power of fanaticism;
- tried to stir up civil unrest by depriving nations of their worship, of the ceremonies that their religious hopes relied on;
- disturbed everything in order to dominate everything;
- commanded treason and treachery, assassination and parricide, all in the name of God;
- brought it about that kings and warriors were sometimes the instruments and sometimes the victims of papal revenge;
- directed the uses of force but never *had* any;
- were terrible to their enemies but trembled before their own defenders;
- were all-powerful throughout Europe, yet insulted

with impunity right at the foot of their altars;

- found in heaven the fulcrum [French: **point d'appui**] for the lever to move the world, but couldn't find on earth any regulator with which they could direct its motion;
- erected a colossus with feet of clay which oppressed Europe and then for a long time wearied the continent with the weight of its debris.

·FEUDAL ANARCHY·

Conquest had inflicted on the West a tumultuous anarchy in which the people groaned under the triple tyranny of kings, warrior generals and priests; but this anarchy carried in its womb the seeds of liberty. We have to include in this portion of Europe the countries that the Romans had never penetrated. Caught up in the general commotion, alternating between conquering and conquered, and having the same origin and *mœurs* as the conquerors of the empire, these peoples were hardly distinguishable from those of the conquerors. Their political state was bound to undergo the same changes and follow a similar route.

I shall present a picture of the ups and downs of this—to give it a name that pretty well describes it—feudal anarchy.

The legislation was incoherent and barbaric. Many of its laws were mild, but this apparent humaneness was merely a dangerous impunity [here = 'lack of any system of punishment']. Still, we see in those countries some valuable laws which, though they in fact defended only the rights of the oppressor classes and were therefore just one more assault on the rights of men, did at least preserve some feeble idea of human rights and were eventually going to serve as a guide to their recognition and restoration.

This legislation had two special features that are typical of the infancy of nations and the ignorance of the primitive ages. **(a)** A criminal could *buy* his way out of punishment

with a sum of money fixed by a law that priced a man's life according to his social rank or his birth. A crime was seen not as •a violation of the security and rights of citizens, to be prevented by the fear of punishment, but as •an assault on an individual, which he or his family were entitled to avenge but for which the law offered something more useful, namely reparation. **(b)** They had so little notion of *evidence* for a factual claim that they thought it simpler—whenever a 'guilty or innocent?' question had to be answered—to ask heaven for a miracle: the outcome of a superstitious trial •by ordeal• or the result of a duel were regarded as the surest means of finding and recognising the truth.

With men who confused independence with liberty, the quarrels arising among those who ruled over a portion of the territory (even a tiny portion) were bound to degenerate into private wars; and these wars between provinces, or villages, constantly exposed the whole surface of each country to all those horrors which in great invasions are •not constant but• only transient, and which in general wars ravage •not the whole country but• only the frontiers.

Whenever tyranny is trying to subject the mass of a people to the will of a few, it uses for this purpose the prejudices and ignorance of its victims. It also tries to make up for the relative smallness of its force—which must surely always be weaker than that of the great majority—by a concentrated and vigorous use of it. But what tyranny wants most but can seldom achieve is to establish a *real* difference between the masters and the slaves, making nature itself somewhat to blame for political inequality. [In that last sentence, 'slaves' (*esclaves*) must be casual rhetoric. On page 42 Condorcet has said that in this era the West had serfs but not slaves.]

That is what the eastern priests *did* achieve back in those times; they were at once kings, pontiffs, judges, astronomers, surveyors, artists and physicians. But what they owed to

their monopoly of intellectual powers the crude tyrants of our weak •western• ancestors obtained by their institutions and their warlike conduct.

- Clad in impenetrable armour,
- fighting only on horses as invulnerable as themselves,
- needing long and painful training to have the strength and skill for training and guiding their horses and for holding and wielding their weapons,

they could oppress with impunity and kill without risk •to themselves• any ordinary man who couldn't afford to buy this expensive weaponry and who never had a chance to devote himself to military training because he always had to work for a living.

Thus the tyranny of the few had acquired, through these military means, a real superiority of strength, which inevitably excluded any idea of resistance and for a long time made useless even the efforts of •the common man's• despair. In this way natural equality disappeared in face of a manufactured inequality of strength.

Morality, taught solely by the priests, included the universal principles that every sect has recognised; but it •also• created a host of purely religious duties and imaginary sins. These duties were more strongly insisted on than those of nature; and actions •that infringed them but were in fact• indifferent, lawful, in many cases even *virtuous*, were censured and punished more severely than actual crimes. Yet the gates of heaven were opened to the wicked by a momentary repentance consecrated by the absolution of a priest; and a life crammed with crimes could be made up for by gifts to the Church and the observance of certain practices flattering to its vanity. They went so far as to make a price-list for absolutions! They took care to include in the catalogue of sins everything from the most innocent indulgences of love—mere simple desires—through to the

most elaborate and excessively disgusting debauchery. It was understood that hardly anyone could escape censure by this standard, so that this was one of the most productive branches of priestly commerce. They even invented a hell of a limited duration; the priests could shorten someone's time in this or even excuse him from it altogether. They demanded payment for this favour, first from the person while he was alive and then after his death from relatives and friends. They sold n acres in heaven for n acres on earth; and they had the modesty not to charge a vendor's fee!

The *mœurs* of this miserable time were what you'd expect from such a deeply corrupt system.

As for this system itself—

- monks discovering old miracles and fabricating new ones, and nourishing with miracles and fables the people's stupid ignorance, deluding them in order to rob them;
- doctors of the Church using all their imagination to enrich their creed with new nonsense, going beyond what had been transmitted to them;
- priests compelling princes to consign to the flames
 - the men who presumed to doubt even one of their dogmas or suspect their impostures or be angry over their crimes,
 - those who departed for an instant from blind obedience, and even
 - theologians who let themselves to dream differently from their superiors in the Church

—these are the only brush-strokes that the *mœurs* of western Europe in this era could contribute to the picture of the human species.

[B] In the East

In the East, united under a single despot, we'll see a slower decline following the gradual weakening of the empire; the ignorance and corruption of each century going a few degrees further than the ignorance and corruption of the preceding one; while riches diminished, the frontiers of the empire were pushed in ever closer to the capital, revolutions were more frequent, and tyranny became more cowardly and more cruel.

In following the history of this empire, in reading the books that each age has produced, even the least trained and least attentive observer can't avoid being struck by this correspondence between the empire's gradual failure and the decline in the people's *mœurs*.

In the East the populace engaged more in theological disputes. These played a larger role in in the history of the eastern empire—having a greater influence on political events there—than such disputes did in the West, and priests' day-dreams there had a subtlety that the competitive West wasn't yet capable of. Religious intolerance is just as oppressive there, but less ferocious.

However, the works of Photius show us that the taste for rational study was not extinct. A few emperors, princes, and even some princesses didn't settle for the honour of performing brilliantly in theological controversy but condescended to cultivate literature.

Roman legislation was altered only slowly in the East, by the mish-mash of bad laws that •greed and tyranny pushed the emperors into or that •superstition extorted from their weakness. The Greek language lost its purity and its character, but it retained its richness, its forms and its grammar; the inhabitants of Constantinople could still read Homer and Sophocles, Thucydides and Plato. Anthemius

explained the construction of Archimedes' burning glasses, which Proclus used with success in the defence of the capital. When the empire fell ·1000 years later·, some of Constantinople's inhabitants took refuge in Italy, and their learning was useful to the progress of enlightenment there. Thus, even in this era the East hadn't reached the ultimate stage of barbarism; but nor were there any signs of its pulling itself up again. It became the prey of barbarians; the feeble remains of intellectual cultivation disappeared; and the earlier genius of Greece *still* awaits the hand of a deliverer in the East.

[C] The Arabs

At the extremities of Asia, and on the borders of Africa, there existed a people which escaped the conquests of the Persians, of Alexander and of the Romans—because of its geographical location and its courage. Some of its many tribes lived by agriculture while others retained the pastoral way of life; all engaged in trade, and some in robbery. United by a shared origin, language and some religious practices, they formed a great nation, though its various parts weren't held together by any political tie.

·MAHOMET·

Suddenly there arose among them a man endowed with ardent enthusiasm and profound astuteness, born with the talents of a poet and of a warrior. He conceives the bold project of uniting the Arabian tribes into one body, and has the courage to make this happen. To impose leadership on a nation that has hitherto been untamed, he begins by building a more refined religion on the debris of the previous worship. Legislator, prophet, chief priest, judge and army general—he has all the means of subjugating men in his

hands, and he knows how to employ them skillfully but also in the grand manner.

He passes out a rag-bag of fables that he says he has received from heaven; but he also wins battles. He divides his ·spare· time between prayer and the pleasures of love. After enjoying limitless power for twenty years—something of which there's no other example—he announces that if he has done anything unjust, he is ready to make reparation for it. Silence! except for one woman who ventures to claim a small sum of money. He dies; and the *enthousiasme* [which could mean either 'fanaticism' or merely 'enthusiasm' in our sense] that he has communicated to his people will change the face of three regions of the world.

·THE HEIGHT OF ARAB CIVILISATION·

The *mœurs* of the Arabs were mild and dignified; they loved poetry and cultivated it; and when they reigned over the finest countries of Asia, and time had cooled the fever of religious fanaticism, a taste for literature and the sciences came to be mixed in with their zeal for spreading the faith, and cooled their ardour for conquests.

They studied Aristotle, whose works they translated. They cultivated astronomy, optics and all branches of medicine, and enriched these sciences with some new truths. To them we owe the application of algebra to far more than the single class of questions to which the Greeks had confined it. Their chemical researches were tainted by their vain search for a way of transforming metals (·e.g. turning lead into gold·) and for a drink that would confer immortality; but they were the restorers, indeed they were really the *inventors*, of chemistry, which until then hadn't been properly distinguished from pharmacy or the study of the processes of the arts. It was with the Arabs that chemistry made its first appearance •as the analysis of bodies so as to make known what their

constituents are, •as the theory of the combinations of those constituents and of the laws governing those combinations.

The sciences were free there, which is why •the Arabs were able to revive some sparks of the Greeks' genius; but •they were subjected to a despotism that was backed by religion. So this light ·of scientific knowledge· shone only briefly, and was replaced by a thicker darkness; and these works of the Arabs would have been lost to the human race if they hadn't prepared the way for the more durable restoration that the West is going to present us with.

So we see for the second time genius abandoning a people that it had enlightened; but ·this isn't surprising, because· it was again tyranny and superstition that drove it out of sight. Born in Greece by the side of liberty, genius couldn't halt the collapse of liberty or defend reason against the prejudices of peoples already degraded by slavery. Born among the Arabs in the womb of despotism and near the cradle of a fanatical religion, genius has—like the generous and brilliant character of that people—proved to be only a short-term exception to the general laws of nature that condemn enslaved and superstitious nations to brutality and ignorance.

So this second example oughtn't to make us afraid regarding the future; but it does warn our contemporaries •to do all they can to preserve and increase knowledge if they want to become free or remain so; and •to maintain their

freedom if they want to keep the advantages that knowledge has brought them.

To the history of the Arabs' achievements I shall add the history of the rapid rise and precipitate fall of that nation. After reigning from the Atlantic coast to the banks of the Indus, then driven by the barbarians from the greater part of its conquests and retaining the rest only to exhibit in them the shocking spectacle of a people driven down to the lowest state of servitude, corruption and wretchedness, the Arab nation still occupies its original territory (·as distinct from its conquests·), where it has preserved its *mœurs*, its spirit, its character, and been able to regain and defend its former independence.

I shall show how the religion of Mahomet—

- the simplest in its dogmas,
- the least absurd in its practices, and
- the most tolerant in its principles,

—seems to have condemned to perpetual slavery and incurable stupidity all that vast portion of the earth over which it has extended its domination; while we're also going to see the genius of the sciences and of liberty shine brightly under the most absurd superstitions and in an environment of the most barbaric intolerance. China exhibits a similar phenomenon, though there the effects of this stupefying poison have been less fatal.

Seventh era

From the first advances of the sciences around the time of their revival in the West to the invention of printing

Various circumstances contributed to the human mind's gradually regaining the energy that had seemed to have been crushed forever by the degrading and heavy chains that had weighed it down.

The priests' intolerance, their efforts to get political power, their scandalous greed, and their dissolute *mœurs* made more disgusting by their hypocrisy, inevitably raised pure souls, healthy understandings and courageous characters against them. People were struck by how their dogmas, maxims and conduct contradicted the gospels that were the original basis for their faith and morality—the evangelists' books—that the priests hadn't been able to conceal entirely from the knowledge of the people.

So powerful outcries were raised against them. In the south of France whole provinces united in adopting a simpler doctrine, a purer christianity, in which any man—answerable only to the divinity [i.e. only to God, not to the priests]—would form his own judgment regarding what the divinity had condescended to reveal in the books that came from him.

Fanatical armies led by ambitious captains laid waste those southern provinces. Executioners, under the direction of legates and priests, slaughtered those whom the soldiers had spared. A tribunal of monks was established with instructions to send to the stake anyone suspected of still listening to his reason.

But they couldn't prevent the spirit of freedom and enquiry from silently advancing. Repressed in one country where it dared to show itself, where more than once intoler-

ant hypocrisy kindled bloody wars, it started up and spread secretly elsewhere. It keeps showing up at intervals until the time when, helped by the invention of *printing*, it became strong enough to rescue a part of Europe from the yoke of the court of Rome.

Back near the start of this seventh era there were already men who, having risen above all the superstitions, settled for despising them in secret, or at most went no further than to ridicule the superstitions in passing, with the ridicule being made more striking by the veil of respect that they took care to cover it with. These boldnesses were forgiven because of their good-humoured tone. They were cautiously distributed throughout works intended for high-ranking or learned readers; they never reached the mass of the people, which is why they didn't arouse the hatred of the persecutors.

Frederick II [13th century] was suspected of being what our priests of the 18th century have since called a *Philosophe* [see Glossary]. The pope accused him, before all the nations, of having treated the religions of Moses, Jesus and Mahomet as political fables. His chancellor Pierre des Vignes was said to have written a book called *The Three Impostors*. Actually there wasn't any such book; but the mere title announced the existence of the opinion—the natural upshot of examining these three creeds that all had the same source—that they were only a corruption of a purer form of worship rendered by earlier people to the universal soul of the world.

Our collections of fables and the *Decameron* of Boccaccio

are full of traits that express this freedom of thought, this contempt for prejudices, this inclination to aim sharp and secret derision at them.

So this era provides us with peaceful despisers of all the superstitions, side by side with passionate reformers of their grossest abuses; and I'll be able to connect—almost—the history of •these quiet rejections and •loud• protests on behalf of the rights of reason with the history of •the last philosophers of the school of Alexandria.

I shall look into whether, when philosophical proselytism was so dangerous, secret societies weren't formed with the aim of perpetuating—spreading quietly and safely among an inner circle—a few simple truths as reliable antidotes to the prevailing prejudices.

I shall examine whether we oughtn't to include among such societies the celebrated order that popes and kings conspired against so basely and destroyed so barbarously. [This refers to the order of the Knights Templar. See 'Jacques de Molay' in Wikipedia; read also, if you can stand it, Browning's poem 'The Heretic's Tragedy'.]

Priests had to be studious, •for self-defence, •to invent pretexts for grabbing secular power and •to perfect their skill in forgery. On the other side the kings, wanting to strengthen their hands in a war in which the claims of each side were backed by authority and precedent, encouraged schools that could provide lawyers they needed to help them against the priests.

In these disputes between the clergy and the governments, and between the clergy of each country and the supreme head of the Church, those who had more honest minds and more frank and upright characters fought •for the cause of the laity against that of priests and •for the cause of the national clergy against the despotism of the foreign head •of the Church•. They attacked these abuses and usurpations

and tried to reveal their origin. This boldness strikes us today as nothing but servile timidity; we smile at seeing men work so hard to prove things that could have been learned through simple good sense; but those were new then, and they often decided the fate of a people. These men sought them with an independent soul; they defended them bravely; and it's through them that human reason began to recall its rights and its liberty.

In the quarrels that arose between kings and nobles, the kings secured the support of the big cities by granting privileges or by restoring some natural human rights; they tried by emancipating •serfs• to increase the number of those who would have the common rights of citizens. And these men, born again to freedom, would come to realise how important it was for them to acquire—through the study of law and of history—a nimbleness and authority of opinion that would help them to counterbalance the military power of the feudal tyranny.

The rivalry between emperors and popes prevented Italy from being united under a single master and enabled many independent societies to exist there. In the small States there was a need to add the power of persuasion to that of force, resorting to negotiation as often as to weapons; and because this political war was really driven by a war of opinion, and because Italy had never entirely lost its taste for learning, it was on course to become a source of enlightenment for Europe—not a bright light yet, but one that promised to grow quickly.

Then religious fanaticism drew the western nations to the conquest of places that were said to have been made holy by the miracles and death of the Christ; and this uproar •had two good effects: it •helped the cause of liberty by weakening and impoverishing the nobles, and it extended the connection of the peoples of Europe with the Arabs—a connection that

had already been •formed by the Arabs' mixing in with the christians of Spain and •cemented by their trade with Pisa, Genoa and Venice. The Europeans learned Arabic, read books in that language, and learned some of the Arabs' discoveries; and if they didn't rise *above* the level at which the Arabs had left the sciences, they at least had the ambition to rise *up to* it.

These wars, undertaken in the service of superstition, destroyed it. The spectacle of many religions eventually aroused in men of good sense •an equal indifference for these creeds that are equally powerless against men's passions and vices, •an equal contempt for the equally sincere and equally obstinate attachment of their devotees to contradictory opinions. [This paragraph in the original contains five occurrences of *également*.]

Republics were formed in Italy; some were imitations of the Greek republics, while others tried to reconcile the servitude of a subject people with the liberty and democratic equality of a sovereign one. Some towns in Germany, to the north, achieved almost entire independence and were governed by their own laws. In certain parts of Switzerland the people broke the chains of feudal and of royal power.

In nearly all the large States mixed constitutions came into being; the authority for imposing taxes and making new laws was divided in some of them amongst the king, the nobles, the clergy and the people; in others amongst the king, the barons and the commons. Under these imperfect constitutions the populace, though still not freed from humiliation, was at least sheltered from oppression; and the real *stuff* of a nation—that same populace—was given the legal right to defend its own interests and to be *heard* by those who were regulating its destiny. In England a famous act solemnly sworn by the king and the great men of the realm secured the rights of the barons and some of the rights of

the •common• men. [This refers to the Magna Carta of 1215.]

Other nations, provinces and even cities also obtained similar charters, though less famous and less well defended. They're the origin of the *declarations of rights* that every enlightened man these days regards as the basis of liberty, but which the ancients didn't—*couldn't*—have any idea of because

- their constitutions were polluted by domestic slavery,
- with them the right of citizenship was hereditary or voluntarily conferred by the state, and
- they never rose to the level of knowing the rights that are inherent in mankind and belong absolutely equally to all men.

In France, England and other great nations the people seemed to want to get their true rights back; but they were blinded by the sense of oppression rather than enlightened by reason, so that they expressed their desires only by violence; for which they were punished by acts of vengeance that were more barbarous and (especially) more unjust, and looting followed by misery that was more severe, •than what they had been rebelling against. •

But in England the principles of the reformer Wycliffe had launched a movement, directed by some of his disciples, which pointed to more thorough and better organised attempts that the people were to make under other reformers in a more enlightened age.

The discovery of a manuscript of Justinian's code led to a revival of the study of jurisprudence and of legislation, and served to make laws less barbarous even among the peoples who knew how to profit from them without being willing to submit to them.

The trade of Pisa, Genoa, Florence, Venice, the Belgian cities and some free towns of Germany embraced the Mediterranean, the Baltic and the European coasts of the North

Atlantic. Their merchants sought out precious commodities of the Levant in the ports of Egypt and out to the furthest shores of the Black Sea.

No-one tried to find, deepen or develop the principles of politics, legislation, or economics; these weren't yet sciences. But as men began to be enlightened by experience, they made observations that could lead to •such principles, and learned things that were going to make the need for •them to be felt.

Aristotle was known at first only by a translation of an Arabic version of his works. His philosophy, persecuted at the beginning, soon held sway in all the schools: it didn't bring new light, but it gave more regularity, more method, to the art of argumentation that theological disputes had given birth to. This discipline didn't lead to the discovery of truth; it didn't even help with evaluating and soundly judging evidence for the truth; but it sharpened men's minds; and the taste for subtle distinctions, the need to

- continually divide and subdivide ideas,
- seize their elusive shades of meaning and
- express them in new words

—all this apparatus, first used in disputes to embarrass one's antagonist or to escape from his traps, was the origin of the philosophical analysis that has since been the rich source of our advances.

We're indebted to these scholastics for the more precise notions that can now be formed concerning

- the supreme being and his attributes;
- the distinction between the first cause and the universe that it is supposed to govern;
- the distinction between mind and matter;
- the different senses that can be given to the word 'liberty';
- what is meant by 'creation';

- how to distinguish the different operations of the human mind from each other; and
- how to classify the ideas the mind forms of *things* and of their *properties*.

But this method was bound to slow the progress of the natural sciences in the schools. All we find in the sciences at this time are:

- a few anatomical researches;
- some obscure work in chemistry, exclusively pursuing the great work of turning base metals into gold;
- some studies in geometry and algebra, which didn't involve knowledge of everything the Arabs had discovered or an understanding of the works of the ancients; and lastly
- some astronomical observations and calculations, which were useful only for making and completing tables and were polluted by a ridiculous admixture of astrology.

Yet the mechanical arts began to approach the degree of perfection they had retained in Asia. In countries of southern Europe the culture of silk was introduced; windmills and paper-mills were established; and the art of measuring time was taken beyond where it had got to with the ancients and with the Arabs.

Two important discoveries characterise this era. **(i)** The loadstone's property of pointing always to the same region of the sky—a property that the Chinese knew and even used in steering their vessels—was also observed in Europe. The compass came into use, an instrument that increased commercial activity, improved the art of navigation, suggested the idea of the voyages that have since given us knowledge of a new world and have enabled man to look at the whole extent of the globe on which he is placed. **(ii)** A chemist, by mixing saltpetre with an inflammable matter, discovered

the secret of ·gunpowder·, the powder that has produced an unexpected revolution in the art of war. Despite the terrible effects of fire-arms, by keeping combatants further apart they have made war less murderous and warriors less ferocious. Military expeditions are more expensive; wealth can counter-balance force; and even the most warlike nations feel the need to enrich themselves through commerce and the arts if they are to have the means of making war. ‘Civilised’ peoples no longer have to fear anything from the blind courage of barbarian nations. Great conquests and the revolutions that follow them have become almost impossible.

The nobles had had the upper hand over the people because of their armour of iron and their skill in riding almost invulnerable horses and in using the lance, the mace, or the sword; and ·with the discovery of gunpowder· all this was completely done away with. The destruction of this last obstacle to men’s liberty and real equality came from an invention which at first glance seemed to threaten the annihilation of the human race!

In Italy the language reached almost its perfection about the 14th century. Dante is often noble, precise, energetic. Boccaccio has grace, simplicity and elegance. The ingenious and tender Petrarch is still fresh. In this territory, whose fine climate comes close to Greece’s, they studied the models of antiquity and tried to bring some of their beauties across into the new language. . . . Already some attempts gave reason to hope that the genius of the ·fine· arts—aroused by the view of ancient monuments, learning their mute but eloquent lessons—was going *again* to add beauty to man’s existence and give him those pure pleasures the enjoyment of which is equal for everyone and grows in proportion as it is shared.

The rest of Europe followed at a distance; but a taste for letters and poetry at least *began* to give a polish to languages that were still barbarous.

The same forces that had driven minds out of their long lethargy also of course directed their activities. When opposing interests were agitating some question, reason couldn’t be brought in to answer it; religion, far from acknowledging reason’s power, claimed to overrule it and gloried in its humiliation; and what politics regarded as just was ·not what reason endorsed but· what had been consecrated by conventions, by longstanding practice, by ancient customs.

No-one suspected that men’s rights were written in the book of nature and that to look for them in any other would be to get them wrong and to violate them. The search for maxims or examples from which to infer maxims was conducted in

- the sacred books,
- respected authors,
- papal edicts,
- the decrees of kings,
- the records of old usages and
- the annals of the churches.

Their way to tackle a principle was never to examine it in itself, but to look into the texts being used to support it—to interpret, to question, to support or to annul *them* by means of yet other texts! A proposition was adopted not because it was true but because it was written in book x and had been accepted in country y ever since century z.

Thus the authority of men was everywhere substituted for that of reason, Books were studied much more than nature and the opinions of the ancients were studied more than the phenomena of the universe. This mental slavery—with no chance yet of an appeal to enlightened criticism—did more harm to the advances of the human species •by corrupting the method of study than it did •by its immediate effects. And the ancients were still too far from being equalled for anyone to think of correcting or surpassing them.

During this era *mœurs* retained their corruption and their ferocity; religious intolerance was even more active than before; and civil discords and the incessant wars among a crowd of petty sovereigns took the place of barbarian invasions and the even more deadly scourge of private feuds. It's true that

- the 'gallantry' of minstrels and troubadours and
- the creation of orders of chivalry that professed generosity and frankness and devoted themselves to the maintenance of religion, the relief of the oppressed and the service of women,

seemed likely to bring into people's *mœurs* more mildness, decency and dignity. But this change was confined to courts and castles and didn't reach the mass of the people. It led to a little more equality among the nobles, less perfidy and

cruelty in their relations with each other; but there was no change in their contempt for the people, the violence of their tyranny, the brazenness of their thefts; and the nations, as oppressed as ever, were as ignorant, barbarous and corrupt as ever.

This poetical and military 'gallantry', this chivalry—largely due to the Arabs, whose natural generosity long resisted superstition and despotism in Spain—had doubtless their use: they spread seeds of humanity that weren't going to grow until happier times. It was the general character of this era that it disposed the human mind for the revolution that the discovery of printing was going to bring, and prepared the ground that the following ages would cover with such a rich and abundant harvest.

Eighth era

From the invention of printing to the period when the sciences and philosophy threw off the yoke of authority

Those who haven't *reflected* on the human mind's progress in the discovery of the truths of science or the processes of the arts must be astonished that after men discovered how to make impressions of drawings it took them so long to discover how to print characters.

No doubt some engravers of plates had had the idea of this application of their art; but they had been more impressed with the difficulty of doing it than with the benefits of success. It is indeed fortunate that they didn't—*couldn't*—suspect how vast that success would be; for if they had, the priests and kings would have combined to stifle at birth this enemy that was going to unmask the priests and dethrone the kings.

·WHAT PRINTING ACHIEVED·

With printing, indefinitely many copies of a work can be made at a small expense. This gives to those who can read access to books that meet their tastes and their needs; and this ease in reading has intensified and propagated the desire to learn to read.

These printed copies of works spread facts and discoveries further and faster than ever before. There comes to be an active world-wide *commerce* in items of knowledge.

·Before printing·, individual manuscripts had to be searched for, in the way we now search for rare books. ·But once printing had been discovered·, things that had

previously been read by only a few individuals could now be read by a whole people and have an impact at almost the same time on everyone who understood the relevant language.

They knew how to address widely scattered nations. They saw how to establish a new kind of platform (**tribune**) •from which to communicate things that are less showy but deeper; •from which the passions aren't pushed around so tyrannically and reason gets a more certain and durable power; •where all the advantage is on the side of truth, because any loss of means to seduce is matched by a gain in means to clarify. A public opinion is formed; it is powerful because so many people share in it, and energetic because the factors that drive it act on all minds at once, even if not always at close range. In short, we now have a tribunal (**tribunal**) in favour of reason and justice, independent of all human power, from which it is hard to conceal anything and impossible to escape.

New methods, the record of the first steps along the road to a discovery, the labours that prepare the way for it, the views that could suggest the idea of such a discovery or create a desire to search for it—these are quickly communicated, and give each individual a conspectus of all the means that the efforts of everyone have been able to create; and high intelligence seems by this mutual help to have more than doubled its powers.

Every new error is resisted from its birth; often attacked before it has even been propagated, it doesn't have time to take root in the mind. The errors accepted from infancy that each person identifies, in a way, with his own reason; and those that fear or hope have made dear to weak souls—these have been *shaken* by the fact that it's now impossible

- to prevent their being discussed,
- to hide the fact that they can be rejected or opposed,

- to set oneself up against the advances of truths which will eventually display their absurdity.

It is to printing that we owe the possibility of spreading works that are called for by current events or passing waves of opinion, thus bringing to bear on some single topic of discussion the views of all the men who speak the relevant language.

Without the help of the art of printing, could we have multiplied books aimed at each class of readers, at each educational level? To printing we owe

- the *prolonged* discussions that are needed to throw light on doubtful questions and provide an unshakable basis for truths that are so abstract, so subtle, so remote from the prejudices of the people and from the common opinion of the scientists, that they would otherwise soon be forgotten;
- wholly elementary books, dictionaries, works in which a multitude of facts, observations and experiments are reported in detail, with all the evidence developed and all the difficulties investigated;
- valuable anthologies, some containing everything that has been discovered, written, thought, in a particular part of the sciences, some reporting the results of the year's work of all the scientists of a single country;
- lists, charts and diagrams of every kind: some enable one to simply *see* results that the mind would have needed hard labour to work out; others make a perfect job of presenting the fact, the discovery, the number, the method, the object that one needs to know; yet others provide in a convenient form, a methodical order, materials from which high intelligence can infer new truths.

All these means of making the human mind's journey faster, surer and easier are benefits of printing.

I'll show other benefits brought by printing when I analyse the effects of the move from •writing about the sciences almost exclusively in one language shared by all the world's scientists to •using in the sciences the vernacular languages of the individual nations.

[In this long paragraph, **(a)** and **(b)** are inserted to help make clear the two kinds of despotism that are in question throughout.] Isn't *printing* what freed the education of peoples from all **(a)** religious and **(b)** political shackles? It would be useless to either kind of despotism •to invade all our schools; •to try by rigid rules fix what errors minds are to be protected from and what truths they are to retain; •to require that professorships dedicated to the moral education of the people or to teaching the young philosophy and the sciences shall teach only doctrines that are favourable to this double tyranny. ·Even if these attempts were made·, printing could still diffuse a pure and independent light. The education that an individual man can get from books in silence and solitude can't be corrupted for everyone; all that is needed is one corner of the free earth where the pages can be loaded into a printing-press. Amid that multitude of different books, of copies of each book, of reprints that can multiply a book overnight, how can all the doors through which the truth might enter be shut tightly enough? It was *hard enough* back when a work could be annihilated merely by destroying a few copies of a manuscript, and when a truth or opinion could be driven into eternal oblivion merely by being outlawed for a few years; hasn't it now become *impossible*, given that it would require continuous vigilance, unrelenting activity? Also there is this point: in addition to •the all-too-obvious truths that directly harm the interests of inquisitors, there are also •others that *surreptitiously* include the former, prepare the way the way for them and are bound some day to lead men to them. Now, even if the inquisitors *could* drive away the former,

how could they prevent the latter from creeping in and spreading? Could they do it without having to do something that would be as fatal to the power of error as the truth itself would—namely, dropping their mask of hypocrisy? So we'll see reason triumphing over these vain efforts. We shall see in this war—a war constantly renewed and often cruel—reason succeeding against **(a)** violence and against **(b)** cunning; **(a)** braving the flames and **(b)** resisting seduction; crushing under its omnipotent hand both

- (a)** fanatical ·religious· hypocrisy demanding that its dogmas be sincerely worshipped and
- (b)** political hypocrisy going on its knees and begging to be allowed to enjoy in peace the profit of errors which—according to these hypocrites—are equally profitable for the people to be sunk in for ever.

The invention of printing [in 1440] nearly coincides with two other events, of which one had an immediate influence on the advances of the human mind, while the other will influence the destiny of mankind for as long as it exists.

I refer to **(i)** the taking of Constantinople by the Turks [1453] and **(ii)** the discovery of the route that gave Europe direct communication with the eastern parts of Africa and Asia. [Vasco da Gama's long sea-voyage in 1497–9 from Portugal to India provided for trade that was 'direct', i.e. didn't involve trading with middle-eastern intermediaries who then traded further eastwards.]

·THE FALL OF CONSTANTINOPLE·

The Greek literati, flying from Turkish domination, sought refuge in Italy. They taught people to read the poets, orators, historians, philosophers and scientists of ancient Greece in their original language; and provided many manuscripts—and soon after, editions—of those works. ·Studious· people stopped confining themselves to worshipping what they had agreed to call 'Aristotle's doctrine'; they looked in his own

writings to find out what his doctrine really was; they went so far as to judge it and to oppose it; they contrasted him with Plato. And by thinking they were entitled to choose a master, they were already starting to throw off the yoke.

Reading Euclid, Archimedes, Diophantus and Aristotle's book on animals and his physics revived the spirit of geometry and physics; and the anti-christian opinions of philosophers re-awakened the almost extinct ideas of the time-honoured rights of human reason.

·WHAT EXPLORATIONS ACHIEVED·

Intrepid men, led by a love of glory and a passion for discoveries, had rolled back for Europe the boundaries of the universe, had shown it new skies and opened unknown territories to it. Vasco da Gama had reached as far as India, after following with tireless patience the immense extent of the African coasts; while Christopher Columbus, trusting himself to the waves of the Atlantic ocean, had reached the hitherto unknown country that stretches out to the west of Europe and to the east of Asia.

This passion, whose restless activity was from then onwards addressed to *everything*, pointed to the ·coming· great advances of the human species; and the heroes of navigation had been animated by a noble curiosity; but the kings and robbers who were to profit from their labour were governed by mean and cruel greed, stupid and fierce fanaticism. The unfortunate inhabitants of these new territories, because they weren't christians, were not treated as men. This prejudice, more degrading to the tyrants than to the victims, stifled all sense of remorse and left the greedy and barbarous men that Europe spewed from her bosom free to satisfy their insatiable thirst for gold and for blood. The skeletons of five million men have covered the wretched countries to which the Spaniards and Portuguese took their greed, their

superstition and their ferocity. These bones will for ever be evidence against the doctrine of the political utility of religions, which has its defenders even today.

It's only in this ·eighth· era that man has been able •to know the globe that he inhabits, •to study the human species in all countries, varied by the long-term influence of natural causes or social institutions, •to observe the productions of land and sea in all temperatures and all climates. And the happy consequences of these discoveries have been:

- the resources of every kind that those productions provide to mankind, still so far from being exhausted that we don't even suspect their extent;
- what the knowledge of those objects has been able to do in the way of adding truths to the sciences and destroying accredited errors;
- the commercial activity that has spurred industry and navigation and—inevitably—all the sciences and all the arts; and lastly
- what this activity has done to give free nations the power to resist tyrants and to empower subject nations to break their chains or at least to loosen the feudal ones.

But these benefits won't compensate for what they have *cost* humanity until the moment when Europe, renouncing the oppressive and sordid system of commercial monopoly, •recognises that men all over the world—equals and brothers, nature says—weren't formed by nature to nourish the pride and greed of a few privileged nations; and, with a better understanding of its own real interests, •invites all peoples to share in its independence, its liberty and its enlightenment. Unfortunately, we have yet to learn whether this revolution will be the honourable fruit of advances in philosophy or—as it has been so far—merely the shameful consequence of national jealousies and the excesses of tyranny.

·THE REFORMATION·

Until this ·eighth· era the crimes of the priesthood had not been punished. The pleas of oppressed humanity, of violated reason, had been smothered in blood and in flames. The spirit that had dictated those pleas was not extinct; but this terrified silence emboldened ·the priesthood· to commit further outrages. At last, a new explosion was caused by the outrage of farming out to the monks the right to *sell* forgiveness of sins in taverns and public places. Luther, with the sacred books in one hand, pointed with the other to

- the pope's claiming the right to forgive crimes and sell pardons;
- the insolent despotism that he exercised over the bishops who had for so long been his equals;
- the way in which the fraternal supper of the first christians had become (under the name 'mass') a kind of magical operation that could be bought and sold;
- priests condemned to the corruption of irrevocable celibacy;
- that cruel and scandalous law ·requiring celibacy· extended to the monks and nuns with which papal ambition had inundated and polluted the church;
- all the secrets of the laity handed over—through confession—to the intrigues and the passions of priests; and finally
- God himself scarcely retaining a feeble share in the worship lavished on bread, men, bones and statues.

Luther announced to the astonished multitude, that these disgusting institutions were not christianity but rather the corruption and shame of christianity; and that to be faithful to the religion of Jesus-Christ one had to start by rejecting the religion of his priests. He used equally the weapons of logic and scholarship and the no less powerful devices of ridicule. He wrote at once in German and in Latin. It was no

longer as in the days of the Albigenses or of Jan Hus, whose doctrines were unknown beyond the walls of their churches and were so easy to libel. The German books of the new apostles worked their way into every town of the empire at the same time, while their Latin books jolted all of Europe out of the shameful sleep that superstition had plunged it into. •Those whose reason had already taken them to where the reformers were going but who had been kept silent by fear; •those who were troubled with secret doubts but trembled to admit them even to their consciences; •those simpler folk who knew nothing of all the theological absurdities and who, having never reflected on the questions at issue here, were astonished to learn that it was up to them to choose from among different opinions;—all entered eagerly into these discussions which, they saw, affected their interests in this world and their happiness in the next.

The whole of christian Europe, from Sweden to Italy and from Hungary to Spain, was instantly covered with supporters of the new doctrines; and the Reformation would have delivered all the European peoples from the yoke of Rome if the mistaken policy of certain princes hadn't ·unintentionally· raised again the same priestly sceptre that had so often weighed down the heads of kings.

This policy, which unfortunately their successors still haven't rejected, was •to ruin their States by trying to add to them and •to measure their power by the extent of their territory rather than by the number of their subjects.

Thus, Charles V ·of the Holy Roman Empire· and Francis I ·of France·, battling one another for control of Italy, sacrificed to the pursuit of good relations with the pope the much greater benefits the Reformation offered to any country that had the wit to adopt it.

Seeing that the princes within the Empire sided with opinions that would increase their power and wealth, the

emperor ·Charles· became the protector of the old abuses, hoping that a religious war would give him an opportunity to invade their States and destroy their independence. Francis imagined that by having protestants burned at the stake ·in France· while protecting their leaders in Germany he would preserve the friendship of the pope without losing valuable allies.

But that wasn't their only motive. Despotism has also its instinct, and that instinct told these kings that •men, after subjecting religious prejudices to the examination of reason, would soon extend the examination to political prejudices; that •after being enlightened on the usurpations of popes they would eventually want to be enlightened on the usurpations of kings; and that •reforming the ecclesiastical abuses that were so useful to royal power might lead to reform of the more oppressive abuses on which that power was based. So no king of a large nation voluntarily favoured the party of the reformers. Henry VIII, slapped down by the pope's anathema [see Glossary], went on persecuting them. Edward VI and Elizabeth, unable to espouse papism without pronouncing themselves usurpers, established in England the faith and manner of worship that came closest to it. The protestant monarchs of Great Britain have always favoured catholicism except when there was the threat of a catholic claimant to their crown.

The kings in Sweden and Denmark saw the establishment of lutheranism as merely a precaution to secure the expulsion of the catholic tyrant from whom they were taking over; and in the Prussian monarchy, founded by a philosophical prince, we already see his successor unable to disguise his secret hankering for the religion—·catholicism·—that kings loved so much.

Religious intolerance was common to all the sects, which passed it on to all the governments. The papists persecuted

all the reformed communions; and the latter, while pronouncing anathemas against each other, joined together against the unitarians who—in a more rational frame of mind—had tested every doctrine if not by the touchstone of reason at least by that of rational criticism, and who had *not* concluded that the only way to free themselves from some absurdities was to retain others equally disgusting. This intolerance ·among the reformed communions· served the cause of papism.

For a long time there existed in Europe—especially in Italy—a class of men who rejected all superstitions, were indifferent to all modes of worship, were governed only by reason, and accordingly regarded religions as human inventions; one might laugh at them in secret, but prudence and policy required an appearance of respect for them.

Later on, boldness went further. While the schools used the •misunderstood philosophy of Aristotle to perfect the art of theological hair-splitting and to make *ingenious* things that would naturally have been merely *absurd*, some scientists used his •actual doctrines as the basis for a system that was destructive of every religious idea. According to this system the human soul was only a faculty, which vanished when life ended, and the only ruler of the world—the only providence—consisted in the necessary laws of nature. These thinkers were opposed by the platonists, whose views (resembling what has since been called 'deism' [see Glossary]) were even more terrifying for priestly orthodoxy.

The terror of punishment soon put a stop to this imprudent frankness. Italy and France were stained with the blood of those martyrs to the freedom of thought. All sects, all governments, all authorities of any kind agreed in just one thing, hostility to reason. Reason had to be covered with a veil that would hide it from tyrants' eyes but let it be seen by philosophy's.

So it was necessary to take refuge in the timid unforthcomingness of that secret doctrine—that religions are fit to be laughed at, though only in private—which always had many adherents. It had been propagated especially among the heads of governments, as well as among those of the Church; and around the time of the Reformation the only things that princes, ministers and pontiffs believed were the principles of religious machiavellianism. These opinions had even corrupted philosophy. Indeed, what morality could be expected from a system one of whose principles is that the morality of the people should be supported by false opinions, that it is all right for •enlightened men to deceive the populace as long as the errors they impose are useful, keeping people in the shackles that •they themselves have escaped from?

If the foundation of all true morality is men's natural equality—the ultimate principal basis of their rights—then what could be expected from a philosophy one of whose maxims is open contempt for that equality and for those rights? No doubt this same philosophy could have contributed to the advances of reason, whose reign it was silently preparing the way for; but while it existed *alone*, all it did was to •replace fanaticism by hypocrisy and to •corrupt those who presided over the destiny of States, while freeing them from their prejudices.

Truly enlightened philosophers, untouched by ambition and extremely cautious in how they went about undeceiving men while not allowing themselves to confirm them in their errors, would have been naturally inclined to embrace the Reformation; but—that is not what actually happened, for at least three reasons. (i) Most of them, deterred by finding just as much intolerance *everywhere*, didn't think they should expose themselves to the drawbacks of a change that would then lead on to the same oppressive restraints as before.

(ii) Given that they had to go on seeming to believe absurdities that they really rejected, they saw no great benefit in reducing the number of those absurdities a little. (iii) They were afraid that by coming out in favour of protestantism they would seem to have been outright hypocrites. So they stayed attached to the old religion, strengthening it with the authority of their reputation.

The spirit that animated the reformers didn't lead to real freedom of thought. Each religion forbade most opinions in the country in which it prevailed. But since the different creeds were opposed to each other, there were few opinions that weren't attacked in some parts of Europe and supported in others. Also, the new communions had been forced to relax dogmatic rigour a little. They couldn't without gross contradiction put unduly tight limits on the right of free enquiry, because they had recently invoked this right to justify their separation from the established religion. They refused to restore to reason its full liberty, but they consented to its prison's being less confined: the chain wasn't broken but it was made lighter and longer. Eventually, in the countries where no religion had been able to suppress all the others, there came to be established something that the ruling sect had the nerve to describe, insolently, as their 'tolerance', namely a system in which some men permit other men to believe what their reason opts for, to do what their conscience dictates, to pay to their common God the homage they think best pleases him. In these countries the 'tolerated' doctrines could be upheld with more or less complete freedom.

We thus see arising in Europe a sort of freedom of thought, not for men but for christians; and even today it exists only for christians, except in France.

But this intolerance—or, strictly speaking, this very limited 'tolerance'—forced human reason to explore the

rights that had been too long forgotten, or rather had never been properly known or properly explained.

Indignant at seeing the people oppressed in the very sanctuary of their conscience by kings—the superstitious or political slaves of the priesthood—some good-hearted men eventually dared to inquire into the foundations of kingly power; and they revealed to the world this great truth:

- liberty is a blessing that can't be taken away;
- there is no prescription in favour of tyranny, no contract that could irrevocably bind a nation to one family;
- magistrates [see Glossary], whatever their titles or functions or power, are the agents of the people and not their masters;
- the people have the right to withdraw any authority that they gave in the first place, if that authority is misused or even if the people merely think that it no longer serves their interests; and lastly,
- the people have the right not only to cancel their agents' authority but also to punish them.

Such are the opinions that Althusius and Languet—and later on Needham and Harrington—boldly professed and energetically expounded. Out of deference to the age in which they lived, they too often relied on texts, authorities and examples; and their opinions obviously owed much more to the quality of their minds and the force of their characters than to an accurate analysis of the true principles of social order.

However, other more timid philosophers settled for maintaining that there were equal rights and duties in both directions between the peoples and the kings, an equal obligation to keep the contracts that had created those rights and duties. An hereditary magistrate might indeed be deposed or punished, but only if he had infringed this

sacred contract, which still held between the people and his descendants. This doctrine, which pushed natural law aside and made everything a matter of positive [see Glossary] law, was supported by legal scholars and theologians: it was more favourable to the interests of powerful men and to the projects of the ambitious, because it struck at the individual who had power rather than at the power itself. So it was embraced by almost all political writers and adopted as the starting-point in revolutions and political dissensions.

History will show us during this era few real advances towards liberty, but more order and force in governments and among the people a stronger and especially a more just sense of their rights. Laws are better combined; they appear less often to be the shapeless result of circumstances and of whims; if they are not yet made by philosophers, they are at least made by learned men.

The popular movements and the revolutions that agitated England, France and the republics of Italy inevitably led philosophers to attend to the part of political theory that consists in observing and predicting the effects that constitutions, laws and public institutions can have on peoples' liberty, on prosperity, on the strength of States and on the preservation of their independence and form of government. Some, such as More and Hobbes, followed Plato in deriving from a few general principles the plan of an entire system of social order and presented the model which (they said) men should continually approach. Others, like Machiavelli, sought in a profound investigation of historical facts the rules that would justify optimism about mastering the future.

Economics as a science still didn't exist; princes didn't count how many men they had, but how many soldiers; finance was merely the art of plundering the people without driving them to revolt; and the only attention governments paid to commerce was in extorting taxes from it, using

privileges to interfere with its workings, or quarrelling with one another over monopolising it.

The nations of Europe, occupied by the common interests that united them and the opposed interests that they thought had to divide them, felt the need to have certain rules of conduct to govern their peacetime relations independently of treaties; while other rules, to be respected even in the midst of war, would soften its ferocity, lessen its ravages and at least prevent its pointless calamities.

So there was a science of the law of nations; but unfortunately these laws were sought not in reason and nature—the only authorities that independent peoples could acknowledge—but in established usages or the opinions of antiquity. Less weight was given to •the rights of humanity and justice towards individuals than to •the ambition, pride and greed of governments.

That is why in this era we don't see moralists inquiring into man's heart, analysing his faculties and his feelings, so as to discover his nature, and the origin and law of his duties and the penalty for failing in them. They *did* know how •to employ every kind of scholastic hair-splitting to discover, regarding actions whose lawfulness seems uncertain, the precise line where innocence ends and sin begins; •to settle what authority has enough weight to justify performing of any of these dubious actions; •to produce methodical classifications of sins, some by genus and species, others in terms of their seriousness; and above all •to identify the kinds of sins such that performing just one of them would deserve eternal damnation.

Clearly the science of morality couldn't exist yet, because priests had the privilege of being the sole interpreters and judges of morality. But these same hair-splittings—as ridiculous as they were scandalous—led to an inquiry into (and helped in the discovery of) •how good or bad actions or their

motives are, •the order and limits of our duties and •the principles that should guide our choice when these duties appear to be in conflict. It's like what often happens when a skilful mechanic, by studying a clumsily built machine that happens to have come his way, sees how to turn it into a new one that is less imperfect and truly useful.

The Reformation destroyed confession, indulgences, monks and the celibacy of priests, thus purifying the principles of morality and even lessening the corruption of *mœurs* in the countries that accepted it. It delivered those countries from priestly forgiveness of sins (that dangerous encouragement to vice) and from religious celibacy, which destroys all the virtues because it is the enemy of the domestic ones. [indulgence: priestly act supposed to reduce the time the recipient will have to spend in purgatory; these acts were *bought*.]

This era was more disfigured than any other by terrible atrocities. It was the era of religious massacres, holy wars and the depopulation of the new world.

It saw, re-established in the new world, slavery that was on the ancient pattern but now more barbaric, more productive of crimes against nature; and mercantile greed trading the blood of men, selling them like merchandise after first 'buying' them by treachery, robbery or murder and dragging them from one hemisphere to be condemned in another—amidst humiliation and outrages—to the prolonged torture of a slow and cruel destruction.

At the same time hypocrisy covers Europe with wood-piles [for burning people at the stake] and assassins. The monster of fanaticism, enraged by its wounds, seems to redouble its fury and to rush to pile up its victims because reason will soon snatch them out of its reach. Yet there can also be seen to re-appear some of those gentle, courageous virtues that do honour to humanity and bring it consolation. History gives them names that it can utter without blushing. Strong, pure

souls—great talents combined with noble characters—appear at intervals among these scenes of treachery, corruption and carnage. The human race still revolts the philosopher who looks at the picture it presents; but it no longer humiliates him, and now offers him hope for the future.

·ADVANCES OF THE SCIENCES AND MATHEMATICS·

The sciences begin to stride rapidly and brilliantly. The language of algebra is generalised, simplified and improved—or rather it was only then that it was truly formed. The first foundations are laid for the general theory of equations, the nature of the solutions they give comes to be better understood, and equations of the third and fourth degree are solved.

The ingenious invention of logarithms streamlines the operations of arithmetic, thus making it easier to apply calculations to real things. And this extends the scope of all the sciences in which a numerical process comes into checking the consequences of an hypothesis or theory against the empirical facts, thereby discovering laws of nature. In fact the sheer length and complicatedness of some calculations put them beyond the range of what we have time (or indeed intellectual ability) to manage, so that science could never have escaped from that range if it weren't for the help of ·logarithmic· abbreviations.

The law of falling bodies was discovered by Galileo, who was able to deduce from it the theory of uniformly accelerated motion and to calculate the curve followed by a projectile launched into the air with a given velocity and accelerated by a constant force acting parallel to the acceleration.

Copernicus •revived the true system of the world that had been forgotten for so long, •destroyed the senses' objections to it by the theory of apparent motions, and •contrasted the extreme simplicity of the real motions resulting from this

system with the almost ridiculous complicatedness of the motions required by the Ptolemaic hypothesis. The motions of the planets were better understood; and the genius of Kepler discovered the forms of their orbits and the eternal laws by which those orbits are governed.

Galileo, applying to astronomy the recent discovery of telescopes (much improved by him), opened a new sky to the view of mankind. The spots he saw on the disk of the sun told him that it rotates, and he determined how fast and according to what laws it does so. He demonstrated the phases of Venus and discovered the four moons that circle around Jupiter and accompany it in its vast orbit.

He also learned how to measure time accurately, by the swing of a pendulum.

Thus man owes to Galileo the first mathematical theory of motion other than uniform motion in a straight line, as well as knowledge of one of the mechanical laws of nature; while to Kepler he is indebted for knowledge of one of those empirical laws the discovery of which brings two benefits: •leading to knowledge of the mechanical law (·Newton's·) of which the empirical laws express the upshot, and •compensating for the lack of that knowledge ·of Newton's law· during the period when it was still out of reach.

The discovery of the weight of air and of the circulation of the blood are notable advances in •experimental physical science that was born in the school of Galileo and in •anatomy, already too extended not to be separated from medicine.

Natural history, chemistry (despite its chimerical hopes and obscure language), medicine and surgery all make astonishingly fast advances, though we are often sad to see the monstrous prejudices that these sciences still retain.

Without mentioning the works in which Gesner and Agricola present much real knowledge that was so rarely altered [see Glossary] by being mixed with scientific or popular

errors, we see Bernard Palissy •displaying to us both the quarries from which we get our building materials and the masses of rock that compose our mountains and were formed from the remains of sea animals—authentic monuments of the ancient revolutions of the globe; and •explaining how water

- raised from the sea by evaporation,
- restored to the earth by rain,
- stopped by beds of clay and
- assembled in snow on the mountains

supplies the eternal stream of waterfalls, creeks and rivers; while Jean Rey discovered the secret of the combination of air with metals, the first seed of those brilliant theories that widened the boundary of chemistry some years ago.

•LANGUAGE AND THE FINE ARTS•

In Italy the arts of epic poetry, painting and sculpture achieved a perfection unknown to the ancients. In France it could be seen in Corneille that the dramatic art was also about to reach a still greater level. The passion for antiquity leads those who have it to see a higher level of genius in *those who created* its masterpieces, and perhaps they are right; but comparing those works with the productions of Italy and of France, a rational enquirer can hardly fail to see the real advances that *the art itself* has made in the hands of the moderns.

The Italian language was completely formed, and in the languages of other peoples we see the marks of their ancient barbarism continually disappearing.

There was a growing sense of the worthwhileness of metaphysics and grammar and of acquiring the art of analysing—explaining philosophically—both •the rules governing the composition of words and sentences and •the customary usages that play a part in it.

In this era we see everywhere authority battling reason for mastery, a contest that prepared for and heralded the triumph of reason.

So this was the time for the birth of the spirit of criticism without which erudition is hardly worthwhile. They still had to know everything that the ancients had done, and were starting to grasp that if they were obliged to admire the ancients they were also entitled to judge them. And criticism was needed in other ways too. Reason, which sometimes got help from authority and was often opposed by it, wanted to estimate the worth of •that help and of •the reasons for making the sacrifices demanded of it. Those who accepted authority as the basis of their opinions and the guide of their conduct felt how important it was for them to be sure of the strength of their weapons and not have them shattered in the first attacks of reason.

•DETHRONING LATIN•

The practice of writing only in Latin on the sciences, philosophy, jurisprudence and (with a few exceptions) even history, gradually gave way to the practice in each country of using the common language of that country. This is the place to look into how the advances of the human mind were affected by this change, which

- made the sciences more popular, but made it harder for scientists to keep up with developments in them;
- led to a book's being read by more poorly-educated people in one country and fewer enlightened men in the rest of Europe;
- removed the burden of having to learn Latin from many men who were anxious to be educated but hadn't the spare time or the means to read deeply, but forced scientists to consume more time learning different languages.

Granted that Latin couldn't be made the common tongue throughout Europe, maintaining it for writing on the sciences would have been only a short-term advantage for scientists. Why? Because the existence of a sort of scientific language for all nations, while the populace of each nation spoke something different, would have

- divided men into two classes,
- perpetuated the people's prejudices and errors,
- posed a permanent obstacle to true equality—to equal use of the same reason, to equal knowledge of essential truths—

and by stopping in this way the advances of the mass of mankind, would eventually have

- put an end, as happened in the East, to any advances by the sciences themselves.

·EDUCATION·

For a long time there had been no education except in churches and cloisters. The universities were still dominated by the priests. Forced to hand over to the government a part of their influence, they retained it in full force with regard to primary and general education, the education that covers knowledge that is needed in all the common professions and among all classes of mankind. Getting its grip on the infant and the growing child, this education models at its pleasure their flexible minds, their uncertain and obedient souls. All they left to the secular power was the right to direct the study of jurisprudence, medicine, advanced science, literature and learned languages, smaller schools to which no pupils were sent who weren't already broken to the priestly yoke.

The priests lost this influence in countries where the Reformation held sway. The common education, though dependent on the government, was still directed there by a theological spirit; but it wasn't now confined to clerics. It

still corrupted men's minds with religious prejudices, but it didn't bend them to the yoke of priestly authority; it still made fanatics, visionaries, sophists, but it no longer created slaves to superstition.

Yet teaching, being everywhere subjugated, had corrupted minds everywhere by •crushing the minds of all the children under the weight of their country's religious prejudices, and in the young people who were going on to higher education by •stifling the spirit of liberty by means of political prejudices.

It's not only that each man, left to himself, found his path to the truth blocked by a close-knit and terrible battalion of the errors of his country and his times, but also the most dangerous of those errors were already, in a way, *his*. Before he could clear away anyone else's errors, he had to recognise his own; before he tackled the difficulties that nature put in the way of his discovering the truth, he needed to (so to speak) rebuild his own understanding. Education was already conveying some knowledge; but for it to be useful it had first to be refined, to be separated from the clouds in which superstition and tyranny had combined to wrap it.

·OTHER HINDRANCES TO INTELLECTUAL PROGRESS·

I will show what obstacles of various strengths were posed to the advances of the human mind by those vices of public education, those mutually conflicting religious creeds, that influence of the different forms of government. You'll see that •the more reason's topics affected political or religious interests, the slower those advances were; that •general philosophy and metaphysics (whose truths directly attacked *all* superstition) were more obstinately held back than political enquiry (whose improvement threatened only the authority of kings and aristocratic parliaments); and that •this applies equally to the physical sciences.

I'll also set out the other sources of inequality—

·unevenness of development·—that could have arisen from the nature of the objects that each science studies or from the methods it adopts.

When the rate of progress in one science varies in different countries, that's the joint effect of political and natural causes. I shall investigate what part of this variation is to be ascribed to •differences in religions, to •forms of government, to •each nation's wealth, power, national character, geographical situation and events it has experienced and finally to •the facts about which nations *happen* to have had any of those extraordinary men whose influence, extending over the whole human race, is especially powerful in their immediate surroundings.

I shall measure •how much each science has advanced ·at a given time· simply by how many truths it has discovered ·up to that time·, and •how much each nation has advanced in each science first by how many of its men know that science's leading and most important truths and next by the number and nature of those truths.

In fact we have reached the point in civilisation where the populace gets benefits from intellectual knowledge, not only through the services it receives from educated men but also through its ability to treat intellectual knowledge as a sort of patrimony—·an inherited fortune from which funds can be drawn·—which the people can themselves use on their own initiative to resist error, to anticipate or satisfy their needs and to deal with the ills of life by preventing them or mitigating them by additional pleasures.

The history of the persecutions that the defenders of the truth were exposed to in this era won't be forgotten. We'll see these persecutions extend from the truths of philosophy and politics to those of medicine, natural history, physics and astronomy. In the 8th century an ignorant pope had persecuted a deacon for contending that the earth was round,

contrary to the opinion of that *orator* Augustine. In the 17th century the much more shameful ignorance of another pope delivered Galileo into the hands of the inquisition, convicted of having argued for the daily rotation of the earth and its annual movement around the sun. The greatest genius that modern Italy has given to the sciences, overwhelmed with age and infirmities, was obliged—the alternative being prison or torture—to ask God to *pardon* him for having taught men to understand his works better and to admire him in the simplicity of the eternal laws by which he governs the universe!

But the absurdity of the theologians was so *palpable* that they had to yield to human understanding and allow men to maintain that the earth moves provided it was only as an *hypothesis* and didn't conflict with the faith! But the astronomers did the exact opposite: they believed the motion of the earth to be real and did their calculations on the basis of the *hypothesis* of its immobility!

The transition from this ·eighth· era to the one that will follow was marked by three great men, Bacon, Galileo and Descartes. Bacon revealed the true method of studying nature by employing the three instruments she has given us for the discovery of her secrets—observation, experiment and calculation. He wanted the philosopher, dumped down in the middle of the universe, to start by renouncing every belief he had received and even every notion he had formed, so as to create for himself a new understanding (as it were) that would admit no ideas that weren't precise, no notions that weren't sound, no truths whose degree of certainty or probability hadn't been rigorously weighed. But Bacon, though supremely able in philosophy, was not so in the sciences; and these methods for the discovery of truth (he gave no examples) were admired by philosophers but made no difference to the course of the sciences.

Galileo had enriched the sciences with useful and brilliant discoveries; he had taught by his own example how to get more knowledge of the laws of nature by a sound and productive method that doesn't require scientists to sacrifice the hope of success to the fear of going wrong. He founded the first school that pursued the sciences without mixing in anything irrational, whether on behalf of prejudices or of authority; and that ruled out with philosophical severity every means other than experiment and calculation. But confining himself exclusively to the mathematical and physical sciences, he couldn't give to men's minds the push that they seemed to be waiting for.

This honour was reserved for the steadfast and ingenious Descartes. Endowed with supreme ability in the sciences, he combined examples and precepts in exhibiting the method for finding and recognising the truth. He applied this method to the discovery of the laws of dioptrics [= 'optics of refraction'], of the collision of bodies and finally of a new branch of mathematics that was going to enlarge the scope of mathematics in all directions.

He wanted to extend his method to every object of human

intelligence: he brought his meditations to bear on God, man, the universe. In the physical sciences he is less sure-footed than Galileo, not having learned enough from his **lessons** to distrust his imagination, to base his beliefs purely on calculation, and to observe the universe instead of instructing it. And his philosophy is less wary than Bacon's because he didn't learn enough from his **example** to interrogate nature only by experiments, and to study man instead of guessing at his nature. But the very boldness of his errors helped the human species to advance. He aroused minds that his two great rivals hadn't been able to awake from their lethargy. He told men to shake off the yoke of authority and not acknowledge any influence that their reason wouldn't endorse; and he was obeyed, because his daring pushed men along and his enthusiasm pulled them.

The human mind wasn't yet free, but it knew that it was formed to be free. Those who ventured to hold that it should remain in chains or who tried to give it new ones were forced to prove that the chains *ought to* be retained or imposed; and it's easy to see it wouldn't be long before they were broken.

Ninth era

From the time of Descartes to the formation of the French Republic

We have seen human reason being formed slowly by the natural advances of civilisation; superstition taking it over so as to corrupt it and despotism degrading it and slowing minds down by loading them with fear and suffering.

Only one nation escaped this double influence. In that happy land where liberty had just lit the torch of genius, the human mind—freed from the baby-harness of its infancy—advanced towards the truth with a firm step. But conquest soon introduced tyranny, followed by its inseparable companion, superstition, and the whole race of man is plunged back into darkness which is apparently going to last for ever. However, daylight returned very gradually; eyes long condemned to darkness blinked open and shut, getting used to the light until they could look straight at it, and high intelligence ventured to re-appear on the globe from which fanaticism and barbarity had for so long banished it.

We have seen reason lightening its chains by getting rid of some of them, and preparing and hastening its moment of liberty by steadily acquiring new forces.

We have now to go through the era in which it finally *breaks* them; in which. . . it gets rid of them, one by one; in which, free at last to go its way, it can't be held up except by obstacles such as are inevitable with each new advance—•results of the very conformation of our intelligence or •obstacles that nature has placed in the way of our discovering the truth. •That is, no obstacles resulting from human actions or attitudes. •

Religious intolerance had forced seven of the Belgian provinces to throw off Spain's yoke and form themselves into a federal republic. The same cause had revived a

spirit of liberty in England, which—tired of long and bloody commotions—finally settled for a constitution that was for a long time admired by philosophy but is now reduced to having no support except national superstition and political hypocrisy.

Lastly, the Swedish nation: it was priestly persecution that gave them the fortitude to seize back some of their rights.

Yet France, Spain, Hungary and Bohemia, amidst the commotions caused by theological quarrels, had seen the annihilation of their feeble liberties, or at least of what looked like liberties.

In the countries said to be free it would be useless to look for the freedom that harms none of the natural rights of man, that doesn't merely affirm that man has those rights but also lets him exercise them. The 'liberty' found in those countries is based on a positive [see Glossary] right that is unequally shared; what privileges it grants to a given man depends on what town he lives in, what class he was born into, how rich he is, or how he makes his living. The best answer we can give to anyone who still maintains that these bizarre distinctions are useful and necessary will be to present a picture showing them—and thus showing how different they are—in different nations.

But in these countries civic and personal liberty are guaranteed by the laws. If in them man isn't all that he ought to be, still the dignity of his nature is not totally degraded; some of his rights are at least recognised; he can't any longer be called a slave—only someone who doesn't yet know how to be truly free.

In nations where during this period liberty suffered more or less real losses, the political rights enjoyed by the mass of the people were so restricted that that the loss of them seems to have been more than made up for by the annihilation of the almost arbitrary [see Glossary] aristocracy under which they had groaned. They have lost the title 'citizen', which inequality had made almost illusory; but status of *man* has been more respected, and royal despotism has saved them from feudal oppression, rescuing them from that state of humiliation. . . .

The laws were bound to improve

- in half-free constitutions, because the interests of those who have the real power there are not always at variance with the general interests of the people; and
- in despotic states, because the public's prosperity is sometimes mixed up with the despot's, or because the despot—in trying to destroy the remaining authority of the nobles or the clergy—introduces a spirit of equality into the laws.

In the latter case, the motive was to establish an equality of slavery, but the results were often salutary.

I shall expound in detail the causes that have produced in Europe a type of despotism that has not appeared at any earlier time or in any other place. It involved an almost arbitrary authority that was restrained by opinion [see Glossary], governed by enlightenment, and tempered by its own interests; and it has often contributed to the advances of wealth, industry, education and sometimes even to the advances of civil liberty.

Men's *mœurs* were softened by the decay of the prejudices that had kept them fierce, by the influence of commerce and industry (natural enemies of disorder and violence which scare away wealth), by the horror induced by still-fresh mental pictures of the barbarities of the preceding era, by a

more general diffusion of the philosophical ideas of equality and humanity, and lastly by the slow but sure effect of the general progress of enlightenment.

Religious intolerance survived, but as a prudent human invention—as a homage to the people's prejudices or as a safeguard against emotional outbreaks from them. It had its ferocity. Burning at the stake, seldom resorted to, was replaced by oppression that was often more arbitrary though less barbaric; and in these recent times persecution appeared only here or there, as an upshot of mere *habit* or of complacency. The behaviour of governments everywhere had reluctantly followed, on all topics, the footsteps of opinion and even of philosophy.

In the political and moral sciences •the level of insight reached by the philosophers is always far above •the intermediate level reached by the general run of thinking men whose shared views constitute what is called 'opinion', while those who direct the affairs of a nation. . . ., whatever its form of government, are at •a lower level still. They follow opinion, but without catching up let alone getting ahead; they are always below it—many years below it, many truths below it.

So now the picture of the philosophical advances and of the spread of knowledge—whose most general and perceptible effects I have expounded—leads us into an era in which the influence of these advances on opinion and of opinion on nations or on their leaders, suddenly stopped being gradual and imperceptible and produced a revolution in the entire populace of certain nations, a secure pledge of the revolution that is bound to embrace the whole human species.

After ages of error, after wandering lost among vague and incomplete theories, writers on law at last came to know the true rights of man, deriving them from this simple truth: *Man is a sentient being, capable of reasoning and of acquiring moral ideas.*

They saw that the sole purpose of men's coming together in political societies was to maintain these rights and that the art of *society* ought to be the art of preserving them with no inequalities and no exceptions. They saw that the means of securing the rights of each individual should be governed by general rules laid down in his community, so that the power of choosing these means and determining these rules could belong only to the majority of the members of that community. Why? Because in this choice no individual can follow his own reason without imposing it on others, so the only principle that can be followed by all without harming equality is the will of the majority.

Each man can commit himself in advance to comply with the will of the majority and this—if everyone does it—turns the will of the majority into unanimity; but he can't commit anyone else, and he can't even commit himself to the majority except on the condition that it won't violate his individual rights after having recognised them.

Such are the rights of the majority over the society or its members and the limits of these rights. Such is the origin of the unanimity that makes all the majority's decisions obligatory for everyone, an obligation that ceases to hold when the unanimity ceases to exist because of a change of individuals. No doubt there are issues on which the majority might more often than not decide wrongly, *i.e.* against the common interest; but what these topics are that oughtn't to be directly settled by majority decisions is something that only the majority can decide. And it alone can •determine who the individuals are whose judgment it will prefer to its own and •set the rules for how those individuals are to go about this business. And it can't dodge its responsibility for pronouncing whether those individuals' decisions have harmed the rights that are common to all.

These simple principles were seen to abolish the idea

of there being between a people and its magistrates [see Glossary] a *contract* that could be annulled only by mutual consent or by a violation of the conditions by one of the parties; and to abolish the opinion—less servile but equally absurd—that once a constitution has been established the people are chained to it, as if the right of changing it were not the primary guarantee of every other right! and as if human institutions, necessarily defective and capable of improvement as men learn more, were condemned to last for ever! So it was seen that one had to give up that sneaky and false political theory which—forgetting that the very nature of men gives them equal rights—would in some places **(i)** apportion rights to countries on the basis of the size of territory, the climate, the national character, the wealth of the populace, or the state of commerce and industry, and in other places **(ii)** grant these rights unequally within countries across the different classes of society, according to birth, fortune, or profession. The result of **(ii)** was to create contrary interests and opposing powers, which then created a need for a corrective equilibrium—which •wouldn't be needed if it weren't for these inequalities and in any case •isn't adequate to correct their dangerous influences.

So they no longer ventured to divide mankind into two species,

- one destined to govern, the other to obey,
- one destined to lie, the other to be deceived,

and they had to recognise that all men have an equal right to be enlightened—to know all the truths—regarding all their interests, and that no power established *by* the people *for* the people can be entitled to hide anything *from* the people.

These principles, for which the generous *Algernon* Sydney paid with his life and to which Locke gave the authority of his name, were later developed with greater force, precision and extent by Rousseau, who earned the glory of placing

them among the truths which it is no longer permissible to forget or dispute.

Man has needs, and faculties to provide for them; and the output of these faculties (differently modified and distributed) is a mass of goods that can provide for the community's needs. Three questions arise. (i) What are the laws governing how these goods are formed or distributed, conserved or consumed, increased or diminished? (ii) What are the laws of the equilibrium between needs and resources that continually tends to be established? [In the original, the following sentence is built *into* (ii).] The equilibrium has the result that

- it is easier to meet those needs, and thus possible to do more for general happiness, when wealth grows—until it reaches its upper limit, and
- as wealth diminishes there are greater difficulties and thus more suffering—until depopulation and abstinence restore the balance.

In this astonishing variety of works and outputs, needs and resources; in this frightening complication of interests that connects a single individual's survival and well-being to his society's general system, making him dependent on all the stray events of nature and of politics and extending (in a way) to the whole globe his openness to experiencing privations or enjoyments; in this seeming chaos (iii) how can one see by a general law of the moral world that •each individual's efforts on his own behalf serve the good of the whole and that •despite the clash of opposing interests the common interest requires that each individual should understand his own interest and be free to pursue it without hindrance?

Thus man ought to be able to employ his faculties, dispose of his goods and provide for his needs in complete freedom. The general interest of his society, so far from restraining him in this respect, forbids any attempt to restrain him. In this department of public order, the care of

securing to every man the rights he derives from nature is •the only sound policy, •the only duty of society as a whole, and •the only law that the general will is entitled to exercise over individuals.

·DUTIES OF THE PUBLIC POWER·

But once this principle is acknowledged, the public power still has some duties to fulfill. It has to make laws laying down, for things that are exchanged, the measures that are to be used for their weight, volume, width and length.

It has to create a common measure of values that can represent any value; this can make it easier to compare and calculate values, and when it comes to *have* a value of its own it can be used as the medium of exchange for everything that *can* be exchanged. Without this, commerce would be confined to direct barter, and would inevitably be very sluggish.

Each year's output has a portion that is *dispensable* in that it isn't ear-marked to pay for the work that produced it or work that will have an equal or better output in time to come. The owner of this dispensable portion doesn't owe it immediately to his own labour; he owns it independently of any use he can make of his faculties to meet his needs. So it is the portion of the ·people's· annual income that the sovereign authority can, without infringing on anyone's rights, avail itself of to meet the expenses of •the State's security, •its internal tranquility, •securing the rights of individuals, •the work of the authorities set up to create or administer law, and finally •the maintenance of public prosperity.

There are works, establishments and institutions that are beneficial to society as a whole and that society ought to establish, direct, or superintend. I'm talking about institutions etc. to handle matters that can't be dealt with *immediately*

by personal inclinations or the coming together of individual interests—matters such as •making advances in agriculture, industry and commerce, and •preventing or mitigating the evils that nature inevitably brings, or ones that unforeseen events add to those.

Up to the start of this ninth era, and even for a long time after, these various matters had been left to chance, to the greed of governments, to the skill of charlatans, or to the prejudices and self-interest of the powerful classes; but a disciple of Descartes, the illustrious and unfortunate Jan de Witt, saw that political economy, like every other science, should be governed by the principles of philosophy and by precise calculation. [Jan de Witt—a brilliant, liberal, republican prime minister of Holland—was lynched in 1672 by a royalist mob.]

But political economy made little progress until the peace of Utrecht promised to Europe a durable tranquility. At that time many minds started to attend to this previously neglected subject; and this new science was raised by James Stewart, Adam Smith and above all (at least as regards precision and purity of principles) the French economists to a level that couldn't have been expected so soon after such a long indifference. [The word 'economist' (*économiste*) occurs only twice in this work, each time in the phrase *économistes français*.]

The main cause of these advances in politics and political economy was the advances in general philosophy, i.e. in metaphysics, taking this word in its broadest sense.

Descartes had restored metaphysics to the domain of reason; he had seen that it should come *entirely* from the evident and primary truths that should be revealed to us by investigating the operations of our mind. But it didn't take long for his eager imagination to lead him off the path that he had mapped, and philosophy seemed for a while to be using its newly regained independence only to wander around among new errors!

Eventually Locke grasped the thread needed to show the way back. He showed that a precise and accurate analysis of ideas, reducing them stepwise to ideas more immediate in their origin or simpler in their structure, was the only way to avoid being lost in a chaos of incomplete, incoherent and vague notions that have come to us haphazardly and been received by us without reflection.

He showed by this analysis that all our ideas result from the operations of our intellect on the sensations we have received, or—more precisely—result from sensations that our memory presents us with simultaneously but in such a way that that our attention is fixed and our perception limited to some part of each of these composite sensations.

He showed that by attaching one word to each idea, properly analysed and defined, we become able to recall constantly the same idea, i.e. the upshot of the same simple ideas kept within the same limits, which lets us use it in a train of reasoning without risk of going astray.

Whereas if our words don't each represent one fixed and definite idea, they can at different times call up different ideas to the mind, which is the main source of our errors.

In short, Locke was the first who ventured to fix the limits of human intelligence, or rather to determine the nature of the truths it can know and the objects it can grasp.

This method was soon adopted by all the philosophers; and it was by applying it to •morals, •politics and •public economy that they became able in these sciences

- to follow a path almost as secure as that of the natural sciences,
- to admit only conclusions that could be proved, separating these from anything that might still be doubtful and uncertain, and
- to settle for not knowing anything that is and always will be unknowable.

Thus, the analysis of our feelings showed us that the development of our capacity for feeling pleasure and pain is •the source of our moral ideas, •the basis of the general truths which—being derived from those ideas—fix the unchanging necessary laws of right and wrong; and showed us the proper motives of obeying those laws, motives that are drawn from the very nature of our sensibility, i.e. from our *moral constitution*, so to speak.

The same method became a kind of all-purpose instrument: they used it to improve the methods of the physical sciences, to clarify principles and to evaluate proofs of them; and they extended it to testing factual claims ·in history·, and to laws of taste.

So this metaphysic, being brought to bear on every topic humans can think about, revealed for each branch of knowledge,

- the process of the human mind in it,
- the nature of the truths that form it into a system,
- and what kind of certainty can be achieved in it.

It's the third of these that has, in a way, placed an everlasting barrier between the human race and the old mistakes of its infancy. It guarantees the collapse of prejudices that we now have (including ones that we aren't even aware of), and it ought to prevent us from dragged back into our earlier ignorance by new prejudices—ones that might replace the old ones but now can have only a brief feeble influence.

In Germany, however, a man of wide and deep intelligence laid the foundations of a new doctrine. His bold and ardent imagination couldn't settle for a modest philosophy that left unanswered those great questions of the spirituality or survival of the human soul, the freedom of man and of God, and the existence of vice and misery in a universe governed by an omnipotent thinking being whose justice and goodness should—one might think—lead him to rule them out. Leibniz

cut the knot that a learned analysis wouldn't have been able to untie. He supposed the universe to be composed of simple indestructible beings, equal by their very nature. The qualities that distinguish any one of these from all the others are determined by how it *relates* to all the others within the system of the universe. The human soul and

the next phrase: *le dernier atome qui termine un bloc de pierre*

lumpishly translated: the last atom that ends a block of stone
but probably means: the smallest particle (an atom) that you end up with if you divide a block of stone into smaller and smaller pieces until you can go no further

are each one of these *monads* ·as Leibniz called them·. They differ only through their different places in the order of the universe.

Of all the possible combinations of these beings, an infinite intelligence chose *one*, and couldn't have chosen any other because this is the most perfect of all. If we are afflicted by the spectacle of misery and vice in the existing universe, the fact is that any other combination would have produced even greater evils.

I shall expound this system which, adopted or at least supported by Leibniz's countrymen, slowed down the advances of philosophy in that part of the world. In England there arose a whole school of philosophers who enthusiastically accepted and eloquently defended the doctrine of optimism, ·i.e. the thesis that this is the best possible world·; but they hadn't Leibniz's skill or depth. Whereas he based the doctrine primarily on the thesis that an omnipotent thinking being *couldn't*, by the very necessity of its (or his) nature, have chosen any but the best of the possible universes, the English optimists tried to show the perfection of our world by looking into the facts about *it*. This led

to their losing the advantages that this system has when considered generally and in the abstract, and often to their wandering around among details that were either revolting or ridiculous.

In Scotland, however, other philosophers—not finding that the analysis of the development of the faculties we *do* have led to any principle that would or provide a sufficiently solid and pure basis for the morality of our actions—credited the human soul with a new faculty, distinct from those of sensation and reason but combining with them. Their only evidence for the existence of this new faculty was their insistence that they couldn't do without it! I'll present the history of these opinions, and will show how they have, while slowing the onward march of philosophy, done good in speeding up the spread of philosophical ideas.

Up to here I have exhibited the advances of philosophy only among men who have cultivated it, deepened it, improved it; it remains to show •what its effects on general opinion have been, and •how reason, while coming to know the certain means of discovering and recognising the truth, also learned to protect itself from the errors that it had so often been led into by a respect for authority, and by imagination. At the same time it destroyed in the mass of individuals the prejudices that had for so long afflicted and corrupted the human species.

So eventually it was permissible to declare openly our right—at long last recognised—to subject every opinion to the test of our reason, i.e. to use in our search for truth the only means we have been given for recognising it. Every man learned, with a kind of pride, that nature hadn't condemned him to basing his beliefs solely on what others told him; and the superstition of antiquity—putting reason below the ecstasies of a supernatural faith—disappeared from society as it did from philosophy.

•PREACHING THE NEW PHILOSOPHY•

There soon formed in Europe a class of men who were less concerned with discovering and deepening the truth than with disseminating it. Pursuing prejudices in all the safe-houses where clergy, schools, governments and former corporations had collected and protected them, they made it their glory •to eradicate popular errors rather than •to push back the boundaries of human knowledge—an indirect way of helping knowledge to advance, and not the least dangerous or the least useful way of doing so.

In England Collins and Bolingbroke, and in France Bayle, Fontenelle, Voltaire, Montesquieu and the schools formed by these celebrated men, will fight for the truth,

- using all the weapons that learning, philosophy, intelligence and writing talent can provide;
- adopting every tone and using every •literary• form, from joking to heart-tugging, from a vast and learned treatise to a novel or mere pamphlet;
- covering the truth with a veil to accommodate weak eyes, leaving them with the pleasure of guessing at it;
- gently caressing prejudices so as the better to aim punches at them;
- almost never threatening prejudices, or attacking more than one at a time, or even attacking one in its entirety;
- sometimes soothing the enemies of reason by pretending to want only half-toleration in religion and only half-freedom in politics;
- keeping mild relations with despotism when fighting religious absurdities, and with religious sects when battling tyranny;
- attacking these two scourges at their heart even when seeming to object only to disgusting or ridiculous abuses, striking at the roots of these deadly trees

while apparently meaning only to prune some untidy branches;

- sometimes teaching the friends of liberty that superstition, which covers despotism with impenetrable armour, should be first victim to be sacrificed, the first chain to be broken; and
- sometimes on the contrary denouncing superstition to despots as the true enemy of their power, and scaring them with recitals of its hypocritical conspiracies and bloody furies;
- never tiring of proclaiming the independence of reason and freedom of writing as mankind's right, as its salvation;
- rising up with tireless energy against all the crimes of fanaticism and of tyranny;
- pursuing in religion, in administration, in *mœurs*, and in laws everything that smacked of oppression, of harshness, of barbarity;
- calling on kings, soldiers, magistrates and local officials, in the name of nature, to respect men's blood;
- reproaching them with energetic severity for all the miseries incurred in battles and in punishments because of their policies or indifference; and lastly
- having as their war-cry *reason, toleration, humanity*.

Such was this new philosophy, loathed by all the many classes of men that exist only through prejudices, live only through errors, and have power only because of men's credulity. It was nearly everywhere accepted but persecuted, having kings, priests, nobles and magistrates as disciples and as enemies. Its leaders had almost always the skill to escape vengeance while exposing themselves to hatred, to hide themselves from persecution while revealing themselves sufficiently not to lose their glory.

Quite often a government rewarded them with one hand

while paying their attackers with the other, condemned them yet boasted over the fact that they had been born in its territory, punished them for their opinions but would have been embarrassed to be suspected of not having those opinions itself!

These opinions would soon be accepted by all enlightened men, openly by some, by others hypocritically concealed in a manner that was more or less transparent depending on how personally timid they were or on how much they were influenced by the opposing interests of their profession or of their vanity. But already ·intellectual· vanity was strong enough for these men to settle—for themselves and often for others—for a merely prudent caution rather than the deep dissimulation of earlier times.

I'll follow the advances of this philosophy in the various parts of Europe into which it spread rapidly—the inquisitions of governments and priests notwithstanding—with help from the fact that the French language had become almost universal. I'll show the subtle skill with which tyranny and superstition deployed against it all the arguments a man could offer for distrusting his own reason, arguments to show it as narrow and weak; thus using pyrrhonism [see Glossary] itself in support of credulity!

This simple system •which regarded unrestricted freedom as delivering the surest encouragements to commerce and industry, •which freed the people from the destructive scourge, the humiliating yoke, of taxes apportioned with such inequality, levied with such extravagance and often with such barbarity, by replacing them with a system of contribution that was fair, equal, and hardly noticeable; **this** theory •which tied the real power and wealth of States to the happiness of individuals and respect for their rights, •which united by the bond of common well-being the different classes into which societies naturally divide themselves;

this soothing idea of a brotherhood of the whole human race, whose gentle harmony is never to be disturbed by any national interest; **these** principles, so attractive from their generous spirit as well as from their simplicity and scope, were propagated with enthusiasm by the French economists.

·THE SPREAD OF THE NEW PHILOSOPHY·

Their success was slower and less general than that of the philosophers; the prejudices they had to combat were more refined, the errors more subtle, than those that confronted the philosophers. They had to •explain before they could •undeceive, and to •educate good sense before they could •judge anything by its standards.

But if they couldn't convert many people to the whole of their doctrine, if they scared off most by the general nature of their maxims and the inflexibility of their principles, if they harmed their cause by adopting an obscure and dogmatic style, by seeming to neglect political freedom so as to focus on the freedom of commerce, and by insisting too absolutely and magisterially on certain parts of their system that they hadn't sufficiently grounded, at least they succeeded in making odious and contemptible the cowardly, crafty and corrupt policy that places a nation's prosperity in •the impoverishment of its neighbours, in •the short-sighted views of a protectionist regime, and in •the petty calculations of a tyrannical exchequer.

But the new truths with which genius had enriched philosophy, politics and public economy, adopted more or less by enlightened men, extended still further their salutary influence.

•The art of printing had been applied to so many subjects, •it had so greatly increased the number of books, •the makers of books knew how to adapt them so well to every level of knowledge, of studiousness and even of fortune, •had so

skillfully made them suitable for every taste and every cast of mind, and •presented instruction that was so easy and often so delightful, and •books had opened so many doors to truth that couldn't ever all be closed again, that there was no longer any class or profession that truth could be kept out of. Accordingly, although there were still many men condemned to a voluntary or forced ignorance, the *line* between mankind's thick-headed portion and its enlightened portion was almost entirely erased, leaving only a *gradual slope* from the height of genius to the depth of stupidity.

Thus, these things—

- a general knowledge of the natural rights of man;
- the opinion that these rights aren't given and can't be taken away;
- a strongly expressed demand for
 - freedom of thinking and writing,
 - freedom of industry and commerce,
 - relief of the people's distress,
 - repeal of penal laws against religious dissidents,
 - abolition of torture and cruel punishments;
- the desire for
 - a milder system of criminal legislation,
 - jurisprudence giving complete security to innocence,
 - a civil code that is simpler and more in harmony with reason and nature;
- lack of bias in favour of any religion, with *all* of them being classified as superstitions or political tricks;
- hatred of hypocrisy and fanaticism;
- contempt for prejudices; and lastly,
- a zeal for the propagation of truth;

—passed, a little at a time, from the writings of philosophers into every class of society whose instruction was not confined

to the catechism and the alphabet, and became the common creed, the badge of everyone who wasn't a machiavellian or an imbecile. In some countries these views formed a public opinion that was general enough for the mass of the people to seem ready to be directed by it and to obey it.

A natural consequence of these principles was the feeling for humanity, i.e. the feeling of •tender and active compassion for all the afflictions of the human race, and of •horror for whatever miseries public institutions, acts of government and private actions add to the miseries inevitably inflicted by nature. This feeling •for humanity• breathed in every written work and in every conversation, and its benign effects were already visible in the laws and administration even of countries subject to despotism.

Philosophers of various nations, embracing in their meditations the interests of mankind as a whole without distinction of country, race or religion, formed a strongly united battalion against all errors, all kinds of tyranny; and they did this despite the difference of their speculative [see Glossary] opinions. Driven by a feeling of universal philanthropy, they fought against injustice when it existed in a foreign country and couldn't harm them, and fought against it also when it was perpetrated by their own country against another. In Europe they rose up against the crimes with which greed had stained the shores of America, Africa and Asia. The philosophers of England and of France were glad to take the name and fulfill the duties of *friends* of those same Blacks whose stupid oppressors disdained to count them even as *men*. The French writers paid the tribute of their praise to the toleration granted in Russia and Sweden, while Beccaria in Italy refuted the barbarous maxims of French jurisprudence.

The French also tried to cure England of its commercial prejudices, and its superstitious respect for the vices of its constitution and its law; while the virtuous Howard •in

England• denounced to the French the casual barbarity that sacrificed so many human victims in their solitary-confinement cells and workhouses.

The violent acts of governments and their seductions lost their fatal power of suppressing the voice of truth; so did the intolerance of priests, and even the prejudices of the nation; and now nothing could rescue the enemies of reason or the oppressors of liberty from the judgment that would soon be that of the whole of Europe.

Finally Europe saw the rise of a new doctrine that was destined give the final blow to the shaky tower of prejudices; I'm referring to the doctrine of the **indefinite perfectibility of the human species**, of which Turgot, Price and Priestley were the first and most illustrious apostles. It belongs in the tenth era, and I'll expound it at length in that context, •starting on page 100•.

•DESPERATE MOVES BY FALSE PHILOSOPHY•

But I should expound now the origin and the advances of a false philosophy which would have deprived reason of its triumph if it weren't for the doctrine of the perfectibility of man.

The false philosophy in question came from some men's pride and others' self-interest. Its secret aim was to perpetuate ignorance and to prolong the reign of error, and its numerous followers •sometimes tried to corrupt reason by shiny paradoxes or to seduce it by the lazy comfort of absolute pyrrhonism; •sometimes insulted mankind by announcing that advances in knowledge would do it no good, and might be dangerous to its happiness and to its liberty; and •sometimes, finally, led men astray through the false enthusiasm of an imaginary 'greatness' or 'wisdom' that lets virtue off from being enlightened and lets good sense off from relying on real knowledge. •In some places they

spoke of philosophy and the deep sciences as theories above the level of ordinary limited folk who are surrounded by needs and subject to difficult daily tasks; •in others they brushed them off as a pile of uncertain and exaggerated conjectures that couldn't stand up to the skill and experience of affairs that a man of State has. They could be heard incessantly •lamenting the decay of knowledge in the midst of its most brilliant advances, •groaning over the degradation of the human species when in fact man were recalling their rights and using their reason; •announcing that an era was approaching in which mankind would swing back into barbarism, ignorance and slavery, at the very time when all the evidence showed that this was no longer to be feared ! They seemed to be either •humiliated by mankind's improvement because they couldn't share in the glory of having contributed to it, or •afraid of its advances which portended the collapse of their importance or their power. But some charlatans—cleverer than those who clumsily strained to prop up the edifice of old superstitions whose foundations had been wrecked by philosophy—tried

- (some of them) to use the ruins as materials for building a new religious creed that would demand from reason only a half-submission, re-establishing its rights and allowing it freedom of belief except for a demand that it believe something incomprehensible;
- (others) to revive by means of secret associations the forgotten mysteries of ancient theurgy [see Glossary]; leaving the populace to its old errors and chaining their disciples to new superstitions, they even hoped that some of their followers could restore the ancient tyranny of the king-priests of India and Egypt.

But philosophy, standing on the unbreakable base that science had prepared for it, set up a barrier that they were powerless to break through.

By comparing the disposition of ·individuals· minds, which I have already sketched, with the prevailing systems of government, one could easily predict that a big revolution was inevitable, and that it would have to happen in one of two ways: **(i)** the populace itself would establish the principles of reason and of nature that philosophy had made so dear to them; or **(ii)** governments would hurry to get ahead of the populace and act in accordance with the way public opinion was moving. Of these revolutions **(i)** would be faster and more radical but more stormy; **(ii)** would be slower and less complete but more tranquil. In **(i)** the price of liberty and happiness would be transient evils ·which are inevitable in a sudden popular revolution·; in **(ii)** the price of avoiding these evils would be a delay in the full enjoyment of liberty and happiness—perhaps a long delay, but inevitably those benefits would eventually appear.

The corruption and ignorance of governments have led to **(i)**, and the sudden triumph of reason and liberty has avenged the human race.

·THE AMERICAN AND FRENCH REVOLUTIONS·

Simple good sense had taught the inhabitants of the British colonies that Englishmen born on the far side of the Atlantic had received from nature exactly the same rights as other Englishmen born under the meridian of Greenwich, and that a difference of 70° of longitude couldn't have changed that. They understood better than the Europeans (perhaps) what rights were common to all the individuals of the human race; and they took these to include the right of not paying any tax to which they hadn't consented. But the British government acted as though it thought that God had created America, like Asia, for the pleasure of the inhabitants of London; and wanted to keep a long-distance grip on a subject nation, which in due course it would use to help it to oppress

European England. It commanded the obedient representatives of the English people to violate the rights of America by subjecting it to compulsory taxation. America announced that this injustice had broken its ties to England, and declared its independence.

One then saw *for the first time* a great people throwing off all its chains and peaceably framing the constitution and laws that it believed would do most for its happiness. Its geographical position and its political history obliged to become a federal republic, so thirteen republican constitutions grew up within it, each based on a solemn recognition of the natural rights of man and having the preservation of those rights as its primary objective. I will draw the picture of these constitutions. I'll show in what ways they were indebted to advances in the political sciences, and what old errors remained, resulting from the prejudices of education. Two examples of the latter: we'll see why the simplicity of these constitutions is altered [see Glossary] by the system of a balance of powers; and why *identity of interests* is adopted as their principle rather than *equality of rights*. I shall show not only

- how greatly this principle of identity of interests, when made the rule of political rights, violates such rights for those who are denied the unrestricted exercise of them, but also
- that this identity ceases to exist at the very instant when it becomes a real inequality.

I shall press this matter because it's the only dangerous error remaining, the only error that enlightened men are still making. I'll show how the American republics implemented the idea (at that time almost new in theory) of the need to establish and regulate by law a regular and peaceful procedure for reforming the constitutions themselves, and to separate the power to do this from the power to make laws.

But in the war that broke out between two enlightened peoples—with one defending humanity's *natural* rights while the other countered with the doctrine that rights are subject to edicts, political interests, and written conventions—this great cause was tried at the tribunal of opinion [see Glossary] with the whole of Europe looking on; the rights of men were vigorously maintained, and developed without reservations or restrictions, in writings that circulated freely from the banks of the Neva in north-western Russia to those of the Guadalquivir in south-western Spain. These discussions penetrated into the most enslaved regions, into the most remote villages, whose inhabitants were astonished to learn that they had *rights*; they learned to know what they were, and came to know that other people had the courage to try to win them back or defend them.

So the American revolution was bound soon to spread to Europe; and if there existed a European country

- where attachment to the Americans' cause led to their writings and principles being more widely disseminated than anywhere else;
- at once the most enlightened and one of the least free;
- where philosophers had the most real knowledge and the government had the most crass and insolent ignorance;
- where the laws were so far *below* the general level of thinking that neither pride nor prejudice would defend the old institutions;

weren't the people of that country destined by the very nature of things to give the first impulse to this revolution that the friends of humanity were waiting for with so much hope and impatience? So it was bound to start with France.

Its government's clumsiness hastened this revolution; philosophy guided its principles; the force of the people destroyed the obstacles that might have slowed it down.

It was more complete than the American revolution, and consequently was less peaceful. The Americans, satisfied with the code of civil and criminal law that they had received from England, not having to reform a corrupt system of taxation, and not having to destroy

- feudal tyrannies,
- hereditary distinctions,
- privileged, rich or powerful corporations, or
- any system of religious intolerance,

had only to establish new powers to replace the ones that had previously been exercised over them by the British nation. Nothing in these innovations made any difference to the mass of the people; nothing changed the relations that had formed among individuals. In France the conditions were opposite to those, so that the revolution had to take in the whole economy of the society, to change every social relation, to work down to the smallest links of the political chain; right down to individuals who, living peacefully on their fortunes or by their industry, weren't connected with public affairs by their opinions, their occupations, or any concern for fortune, ambition, or glory.

Because the Americans appeared to be fighting only against the tyrannical prejudices of the mother country, they had as ·open· allies the powers that were rivals of England; while other nations, jealous of England's wealth and pride, aided the triumph of justice by secret treaties; so all Europe seemed to be united against the oppressors. Whereas the French ·revolutionaries· attacked, all at once,

- the despotism of kings,
- the political inequality of half-free constitutions,
- the pride of the aristocracy,
- the domination, intolerance and wealth of the priests,
and
- the feudal abuses that still covered most of Europe;

so inevitably the powers of Europe united on the side of tyranny. France had in its favour only the voice of some wise men, and the timid prayers of the oppressed peoples; and calumny has since worked hard to deprive it of even those small helps.

I shall show why the principles on which the constitution and laws of France have been brought together are more pure, more precise and more profound than the ones that directed the Americans; why they have escaped much more completely from the influence of all sorts of prejudices; how in them the equality of rights is never replaced by that 'identity of interests' which is nothing but its feeble and hypocritical substitute; how in them *limits on powers* have been put in the place of that long-admired but empty *balance of powers*; how in a large nation that is necessarily dispersed and divided into a large number of separate and partial assemblies, they dare *for the first time* to let the populace keep its right of sovereignty, the right to obey only laws whose manner of formation by trusted representatives is legitimised by the immediate approval of the populace; laws which, if they harm its rights or interests, the populace can always reform by a regular act of its sovereign will.

·ADVANCES IN THE SCIENCES·

From •the time when Descartes's genius impressed on minds that general impulse that is the primary driver of a revolution in the lives of the human species to •the happy era of entire and pure social liberty where man has been able to regain his natural independence only after enduring many centuries of misfortune and slavery, the picture of the advances of the mathematical and physical sciences presents us with an immense horizon; we'll have to sort out and order its various parts, if we are to have a good view of their inter-relations and a good grasp of the whole.

The application of algebra to geometry became the fruitful source of discoveries in both those sciences; but, more than that, in showing by this great example how •the methods for computing magnitudes in general can be extended to all topics involving spatial measurement, Descartes was giving advance notice that •they would be employed with equal success on all topics where precise valuation was possible. This great discovery, by showing for the first time the ultimate aim of the sciences—namely, to bring strict calculation to bear on all truths—gave hope *that* this would be achieved and a glimpse of *how*.

This discovery was soon followed by the discovery of a new method of calculating which lets one find the rate of increase or decrease of a variable quantity, or to find the quantity itself when this rate is given; whether the increase is supposed to have a positive magnitude or the rate is to be determined for an instant only—i.e. when the increase is nil. This method applies to all the combinations of variable magnitudes and to all the hypotheses concerning their variations; so it enables us to determine, with regard to everything whose changes are precisely measurable, either the relations between the elements when only those between the objects are known, or the relations between the objects when only those between the elements are known. [That sentence, from 'either' to the end, is copied from a previous translation. It isn't quite faithful to the original, but the original has clearly suffered a mishap, and this rescue effort isn't bad.]

The discovery of these methods is due to Newton and Leibniz, the way to it having been prepared by the work of geometers of the previous generation. The methods in question have been advancing uninterruptedly for more than a century. These advances have been the work of several men of genius, to whom they have brought glory. To the eyes of a philosopher who can observe them even if he can't follow

them, they present a striking monument to the powers of the human mind.

In expounding •the formation and principles of the language of algebra, which is the only truly accurate and truly analytic language that we have so far, •the nature of the technical procedures of this science, and •the comparison of these procedures with the natural operations of the human understanding, I shall show that even if this method is in itself only one particular instrument in the science of quantity, it includes the principles of a universal instrument that can be applied to all combinations of ideas.

Rational mechanics soon becomes a vast and deep science. The true laws of the collision of bodies, which Descartes was wrong about, are finally known.

Huyghens discovers the laws of circular motion; and at the same time he gives a method for determining, for *any* point on *any* curve, the circle it belongs to. By uniting these two theories, Newton found the theory of curvilinear motions; he applied that to the laws that Kepler found the planets to obey in their elliptical orbits.

A planet launched into space at a given instant with a given velocity and direction will follow an ellipse around the sun by virtue of a force directed towards that star, the force •at any moment• being inversely proportional to the square of the distance •between the sun and that planet at that moment•. The same force retains the satellites in their orbits around the primary planets: it pervades the whole system of heavenly bodies and acts reciprocally between all their component parts.

The regularity of the planetary ellipses is disturbed by this force, and calculation precisely explains the very tiniest details of these perturbations. This force acts also on the comets, whose orbits are determined and whose returns are predicted by the same theory. The movements observed in

the axes of rotation of the earth and the moon also attest to the existence of this universal force. Lastly, it is the cause of the weight of terrestrial bodies. It appears to be constant in them because we don't get to observe them at sufficiently different distances from the centre of action, ·i.e. from the earth toward which they are being pulled·.

So at last man has come to know one of the physical laws of the universe. It is the only one so far, and in this uniqueness it matches the glory of him who discovered it.

A hundred years of ·scientific· work have confirmed this law, which all the celestial phenomena seem to conform to with a (so to speak) miraculous accuracy. Every time an apparent deviation occurs, this passing uncertainty has soon become the subject of a new ·scientific· triumph.

Wanting to know the secret thread that guided a man of genius, we have in most cases been forced to search for it in his writings; but in Newton's case we have precious anecdotes enabling us to follow him step by step, anecdotes that have been discovered and preserved because admiration for him has made him especially interesting. They serve to show us how a great discovery can arise from a fortunate combination of chance events and the efforts of genius; and how easily less fortunate combinations could have delayed the discoveries or left them to be discovered by others.

But the discovery of this general law of nature may not have been Newton's only contribution to the advances of the human mind; he ·also· taught men to allow in physics only theories that are precise and open to calculation, theories that give an account not only of a phenomenon's existence but of its quantity and extent. Yet he was accused of reviving the 'occult qualities' of the ancients because the general cause he offered for celestial phenomena was a simple *fact*, which observation had incontestably proved to be real. This accusation shows how greatly the methods of the sciences

still needed to be enlightened by philosophy.

Many problems in statics and dynamics had been successively proposed and resolved when d'Alembert discovered a general principle that can determine, all on its own, the motions of any number of •points acted on by any forces and related to each other by certain conditions. He soon extended this same principle to •finite bodies of a determinate shape; to •elastic or flexible bodies which can change shape but only according to certain laws and preserving certain relations among their parts; and lastly to •fluids themselves—ones that keep the same density and ones that can expand. A new calculation was needed to resolve these last questions, but d'Alembert's genius was up to that; and mechanics is now nothing but a science of pure calculation.

These discoveries belong to the mathematical sciences; but the natures of the law of universal gravitation and of the principles of mechanics—consequences of it—apply to the eternal order of the universe and belong to the province of philosophy. We learn that all bodies are subject to necessary laws that tend unaided to produce or maintain equilibrium, cause or preserve the regularity of bodies' motions.

Astronomy's advances are assured by the combined working of several causes:

- knowledge of the laws that govern the celestial phenomena,
- the discoveries in mathematical analysis that lead to the most precise methods of calculating the appearances of those phenomena,
- the hitherto undreamed-of perfection to which optical instruments have been brought, and also instruments whose precise calibration determines the exactness of the observations,
- the precision of machines for measuring time,
- the more general liking for the sciences, which—

combined with the interest of governments—leads to an increase in the number of astronomers and observatories.

For man the heavens are enriched with new stars, and he knows how to determine and predict with accuracy their positions and their movements.

·ADVANCES IN PHYSICS·

Physics, gradually escaping from Descartes's vague explanations, just as it previously cleared itself from the absurdities of the scholastics, is now nothing more than the art of interrogating nature by experiments for the purpose of afterwards deducing more general facts by computation.

The weight of air is known and measured; the transmission of light is found not to be instantaneous; its velocity is determined; the effects of that velocity on the apparent positions of the celestial bodies have been calculated; sunlight is broken down into distinct rays which are of different colours and bend differently when they go through a prism. The rainbow is explained, and the methods of causing its colours to come or go are subjected to calculation. Electricity—formerly known only as the ability of certain substances to attract light bodies towards them after they are rubbed—now becomes ·known to be· one of the general phenomena of the universe. The cause of thunder is no longer a secret, and ·Benjamin· Franklin teaches men how to change its course and direct it as they will. New instruments are used to measure variations in the weight of the atmosphere, in the humidity of the air and in the temperature of bodies. A new science called 'meteorology' teaches men to understand and sometimes to predict atmospheric phenomena; we don't yet know the laws governing these, but some day this science will reveal them to us.

In depicting these discoveries I'll show how the methods

that physicists have used in their researches are purified and perfected; and how the art of conducting experiments and making instruments has become ever more precise, so that not only is physics enriched every day with new truths but also the truths already known have been more exactly ascertained; and not only have vastly many new facts been observed and analysed but also all of them have been submitted to stricter measures in their details.

·ADVANCES IN CHEMISTRY·

All that physics had to combat were the prejudices of scholasticism and the attraction—so seductive to lazy minds—of general hypotheses. The advances of chemistry were held back by other obstacles. It had been thought that this science ought to provide the secret of making gold, and that of making man immortal.

The effect of great interests is to make man superstitious. Those prospects arouse the passion for glory and flatter the two strongest passions of vulgar minds—to make gold and to live for ever.—and it wasn't thought that either could be accomplished by *ordinary* means. So all the extravagances that delirious credulity had ever invented seemed to come together in the minds of chemists!

But these fantasies gradually retreated in face of Descartes's mechanical philosophy; although that itself was rejected, it cleared the way for a truly experimental chemistry. The observation of the events that accompany the composition and decomposition of bodies, research into the laws of these operations, and the analysis of substances into more and more simple elements, became ever more precise and strict.

But to these advances of chemistry we must add the improvements of the sort that involve the whole system of a science and, by extending its methods rather than increasing

the number of its truths, foretell and prepare the way for a very satisfactory revolution. **Example:** The discovery of new means of capturing and experimenting on the elastic fluids which had previously escaped unnoticed; a discovery which, by permitting us to operate on an entire class of new beings and on previously known ones when in a state that had enabled them to escape our researches, and by adding one more element to almost every combination, has switched the whole system of chemistry for a new one, so to speak. **Another example:** The formation of a language in which the names of substances sometimes express the resemblances or differences amongst those that have an element in common and sometimes express the class to which they belong. To these causes of progress we may add the use of a scientific notation in which these substances are represented by analytically combined characters which can express the most common operations and the general laws of chemical affinity. Also, chemistry has been enriched by the use of all the means and all the instruments that physicists have used to compute with rigorous precision the results of experiments; and lastly by applying mathematics to the phenomena of crystallization, i.e. to the laws according to which the elements of certain bodies come together in regular and constant shapes.

Men who for so long had had no way of explaining the formation of the earth except by superstitious or philosophical daydreams, before they started trying to understand it properly, have at last felt the need to study with scrupulous attention both its surface and the internal parts that their needs have led them to dig down to—the substances found there, their random or regular distribution, and the disposition of the masses they have formed. They have learned to recognise in the earth the traces of the slow and long-continued action of the sea, of rivers and of volcanic fires;

and to distinguish those parts of the surface and outer crust of the globe where sea, rivers and magma have produced the inequalities, the layout of substances, and frequently the substances themselves, from the other portion of the surface, mostly made of different substances and bearing the marks of more ancient revolutions whose causes we don't yet know.

Minerals, vegetables and animals are divided into species whose individual members are barely noticeably different from one another. . . . Many of these species resemble each other in some number of respects which serve as bases for successive divisions into larger and larger groups. Naturalists have learned to classify individuals methodically on the basis of determinate features that are easy to grasp—the only way they can be recognised among this numberless multitude of individuals. These methods are a kind of real language in which each object is denoted by some of its most constant qualities; and someone who knows these can find the name an object has in the conventional language. When such a language is well made it indicates the truly essential qualities in each class of natural objects—qualities that jointly guarantee a more or less complete resemblance in the rest of their properties. [The language in question is 'real' in the sense that it maps onto a system of qualities that real things have; it is 'conventional' simply in that its choice of actual words is conventional.]

We have sometimes seen this happen: men who have studied some objects exclusively, and achieved knowledge of them only with great difficulty, have in their self-importance seen their methods as more important than they are, and have taken for a science itself something that is merely a kind of dictionary and grammar of its real language. We have also seen the opposite mistake: philosophers who have wrongly under-rated these same methods, taking them to be futile and laborious compilations—mere arbitrary name-lists.

[The bold-type headings in this paragraph are added.] Here is what natural history looks like to us today. **Animal-vegetable-mineral:** The chemical analysis of the substances in the three great kingdoms of nature, the description of their external form, the exposition of their physical qualities and of their usual properties. **Organisms:** The facts about the development of organised bodies (animals or plants), and of their nutrition and reproduction; the details of their organisation, the anatomy of their various parts and the functions of each. **Animal behaviour:** The facts about animals' ways of life—their industry to procure food, defence and habitation, to seize their prey or escape their enemies; the societies of family or species that are formed among them. **The organic hierarchy:** The great mass of truths we are led to by thinking our way along the immense chain of beings—the way successive links take us •from brute matter to •the lowest level of organisation, from •organised matter to •matter with the first signs of feeling and spontaneous motion, and from •this level to •man. **Man and the rest:** The relation of man to all these other beings •on the chain, whether relative to his needs or to the ways in which he resembles them and the ways in which he is unlike them.

The physical man is himself the topic of a separate science, *anatomy*, which in the word's general meaning includes physiology. This science, which had been held back by a superstitious respect for the dead, profited from the general weakening of prejudices; and it enlisted, against those prejudices, the support of powerful men who had a concern for their own health! It has advanced so far that it seems in a way •to have dried up, •to be waiting for more perfect instruments and new methods, and •to be nearly reduced, today, to seeking—in comparisons between

- the parts of animals and the parts of man,
- the organs that different species have in common, and

- the ways in which those organs exercise similar functions

—truths that the direct observation of the human body appears to refuse. Almost everything that the eye of the observer, aided by the microscope, has been able to discover, is already revealed. Anatomy appears to need experiments, so useful to the progress of other sciences; but the nature of its object deprives it of this means that is now so evidently necessary for its further improvement.

The circulation of the blood was already known; but

- the lay-out of the vessels that carry the chyle to mix with the blood and make good its losses,
- the existence of a gastric fluid that readies the ingested food for the decomposition that is needed to separate out the portion of it that can be assimilated by the living fluids and the organised matter,
- the changes undergone by the various parts and organs in the interval between conception and birth, and then post-natally during the different ages of life,
- the distinction between the parts possessing sensibility and those that have only irritability [see Glossary], a property discovered by Haller and possessed by nearly all organisms

—there's what physiology has been able to discover during this brilliant era, relying on indubitable observations. These important truths should secure forgiveness for the mechanical, chemical and organic explanations that have succeeded each other and burdened this science with hypotheses that are harmful to its progress and downright dangerous when medical practice is based on them.

To the picture of the sciences we should add that of the arts [see Glossary], which, being founded on them, have advanced with a surer tread and broken the shackles of *routine* which had previously held them back.

I shall show how advances in mechanics, astronomy, optics and the art of measuring time have influenced the art of constructing, moving and directing vessels at sea. I shall show how an increase in the number of observers, greater skill on the part of navigators, and more rigorous accuracy in the astronomical determinations of positions and in topographical methods, have at last let us know at first hand this globe of which almost nothing was known at the end of the last century; and how greatly the mechanical arts (properly so called) have owed their improvements to improvements in the art of making instruments, machines, looms, and how much *these* improvements have owed to advances in rational mechanics and physics. These arts are also indebted to the science of using already known machines more cheaply and efficiently, and to the invention of new machines.

We'll see architecture draw from the science of equilibrium the way to give the most commodious and least expensive form to roofs without fear of altering their solidity; and from the theory of fluids the means •to calculate more securely what is needed to hold a given body of water in place, •to direct the course of water, and •to use it in canals with greater skill and success.

We'll see the chemical arts enriched with new processes; the previous methods simplified and cleared of the deposit left by routine—useless or toxic substances, pointless or imperfect practices; while they also found ways to prevent some of the dangers, often terrible ones, to which the workmen were exposed. That's how they could produce more riches and enjoyment without having to pay such a price in ·their· painful sacrifice or ·our· guilt.

In the meantime chemistry, botany and natural history spread a productive light on the economic arts, on the growing of plants and trees to meet our various needs;

on the art of feeding, propagating and preserving domestic animals, bringing their races to perfection and improving their products; on the art of preparing and preserving the productions of the earth or of animals.

From the moment when anatomy and chemistry give them clearer and surer guides, surgery and pharmacy become almost new arts.

Medicine—which in its practice should be considered as an art—is at least delivered from its false theories, its pedantic jargon, its murderous routines, and its servile submission to the authority of men and the doctrines of colleges; it learns to trust nothing but experience. Medicine has increased the means at its disposal, and learned how to make a better job of combining and using them; and though some of its advances are in a way negative, consisting in the abolition of dangerous practices and harmful prejudices, the new methods of studying chemical medicine and of combining observations are a promise of more positive and extended advances.

I'll try above all to follow the path of genius in the sciences, which sometimes moves from an abstract and profound theory to learned and delicate applications, then simplifies its means and adapts them to ·people's· needs, and finally spreads its advantages through the most everyday practices; and sometimes ·goes in the opposite direction·, starting from the needs of everyday practices and going into high-level theorising in search of resources that the ordinary state of our knowledge would have refused to give us.

I'll show that declamations against theories as being useless have never, even with regard to the simplest arts, shown anything but the ignorance of the declaimers. I shall show that the uselessness (or worse) of so many applications of theories is due not to their profundity but on the contrary to their imperfection—·i.e. not to their belonging to the class

of *theories* but to their being poor specimens of that class.

These observations will lead us to the following general truth. In all the arts the truths of theory have to be modified in practice; some inexactness is inevitable in the nature of things, and we should try to make it negligible in practice without indulging the illusory hope of avoiding it altogether; many facts about needs, means, time and expense, which a theory can't take account of, do have to be taken account of in dealing with real immediate practical problems; and, lastly, in bringing in these facts with the skill that truly constitutes the genius of the practical man, one can get beyond the narrow limits that prejudices against theory threaten to impose on the arts, while preventing the errors that an improper use of theory could lead to.

Sciences that are separate from each other can't be extended without coming closer, without forming points of contact.

An account of the advances each science will suffice to show •what the usefulness of the direct application of mathematics has been in several of them; •how much calculation has done, in almost all of them, to make experiments and observations more precise; •what the sciences owe to mechanics for providing them with more perfect and more accurate instruments; •how greatly the discovery of microscopes and of meteorological instruments has contributed to the perfection of natural history; •what this science owes to chemistry, which was needed to lead it to a deeper knowledge of the objects it considers, by displaying their most intimate nature and most essential properties—by showing their composition and elements; •what natural history does in return for chemistry by providing so many products to analyse and gather, so many operations to perform, so many naturally formed combinations whose true elements must be separated out and whose secrets may sometimes be

discovered or even imitated; and lastly •what helps physics and chemistry are apt to give one another, and how greatly anatomy has already profited from these sciences and from natural history.

But even after expounding all that I still would have presented only a small portion of the advantages that have been received or can be expected from the application of mathematics. Several geometers have given us general methods of working out from observations the empirical laws of phenomena. These methods extend to all the sciences, because they are equally good in enabling us to know

- the law of the successive values of the same quantity for a series of instants or positions, and
- the law governing how different properties, or different values of a similar quality, are distributed among a given number of objects.

Several applications have already proved that the science of combinations can be successfully used to set out observations in such a way as to see more easily their relations, their results, and them as a whole.

•MATHEMATICS OF PROBABILITY•

Applications of the calculus of probabilities foretell how much they can contribute to advance the sciences; •here enabling us to determine the likelihood of extraordinary factual claims, teaching us to judge whether they should be rejected or instead are worth looking into; •there enabling us to calculate the likelihood of the constant recurrence of those facts that often present themselves in the practice of the arts, and don't fall into any order that is already regarded as a general law. Examples of that in medicine: the salutary effect of certain remedies, the success of certain preservatives. These applications also show us how probable it is that a set of phenomena results from the intention of a thinking being, or

depends on other previous or contemporary phenomena; and how probable that it should be attributed to the necessary and unknown cause known as *chance*, a word whose real meaning can't be properly grasped except through the study of the mathematics of probability.

[Background to this next paragraph: the formal properties of voting systems are still an active and practically important topic of logico/mathematical study; our writer was one of its founders, and 'Condorcet condition' is still a working technical term in it.]

The mathematics of probability has also taught us to recognise the various levels of certainty that we can hope to achieve, the likelihood that an opinion should have if we're to adopt it and base our reasonings on it without harming the rights of reason and the rules of our conduct, ·i.e.· without offending against justice or lacking in prudence. Probability theory also shows what the advantages and disadvantages are of various forms of election, various ways of basing a decision on the number of votes supporting it; the different levels of probability that may result from such proceedings; the level of probability that public interest should demand for a given question; . . .

[The rest of this paragraph is obscure. The preparer of this version received help with it from Jean-François Laslier, who reports that it is too condensed to stand on its own for a reader who doesn't know the earlier work of Condorcet's on which it relies. What follows is Dr Laslier's statement of what Condorcet is getting at in the rest of the paragraph.]

. . . and the means for dealing with two different kinds of case: (1) There are two alternative opinions P and not-P; a choice has to be made, and the stakes are such that we will follow the opinion we think is most likely true. (2) There are two asymmetrical alternatives. Two species of this are the following: **(a)** We raise the question 'do we have enough to believe that P is true?' Note that we may

reject P while not accepting not-P. **(b)** The stakes are such that the consequences of mistakes about P and not-P are very different; for example, a death penalty needs a high degree of confidence about guilt. Then the questions solved with the help of the calculus of probability are questions of institutional design, for instance how many voters in total, and how many votes on one side, do we need to take a particular type of decision?

These applications include the examination of the probabilities of factual claims for those who aren't in a position to rely on their own observations in the given case—the probabilities that result either from the testimony of witnesses or from the connection of those claims with others ·whose truth has been· immediately observed.

Then there are inquiries into the duration of human life, the influence on longevity of differences in sex, temperatures, climates, professions, governments and life-styles; into the death-rate from various diseases; into changes in population numbers; into how much various causes contribute to these changes; into the distribution of the populace in each country according to the age, sex and occupation—how useful these researches can be to the physical knowledge of man, to medicine and to public economy!

How much the calculus of probabilities has been used by the part of the public economy that concerns the establishment of annuities, ton tines [look it up], private savings banks, benefit schemes and insurance policies of every kind!

Isn't that calculus also needed for the part of the public economy that deals with the theories of measures, coinage, banking, financial operations—as well as taxation as established by law, of actual taxation (often not the same thing), and of the effects of both on all parts of the social system?

How many important questions there are in the science of public economy that couldn't have been properly answered

without help from knowledge acquired in natural history, agriculture, botany and the mechanical and chemical arts!

In short, such has been the general progress of the sciences that it's virtually true that not one of them could be completely grasped—in its principles and its details—by someone who didn't get help from all the others.

In presenting this picture both of •the new facts that each science has been enriched with and •of what each science owes to the application of theories or methods that seem to belong more particularly to another branch of knowledge, I'll try to learn what the nature and limits are of the truths that observation, experience, or meditation can lead us to in each science; I'll also investigate what in each science constitutes the *gift for discovery*—the first faculty of the human mind—which we call 'genius'; by what operations the mind can arrive at the discoveries it pursues, and sometimes be led to others it wasn't looking for and perhaps couldn't even have envisaged in advance. I shall show how the methods that lead us to discovery can become exhausted, so that the science ·in question· grinds to a halt until new methods arrive •to provide the researcher with a new instrument or •to make it easier for him to use older methods that have become too time-consuming or laborious to use.

·BENEFITS FROM SCIENTIFIC ADVANCES·

If I confined myself to exhibiting the advantages that have been drawn from the sciences in their immediate use or in application to the arts, whether for the welfare of individuals or the prosperity of nations, I would have shown only a small part of their benefits. The most important benefit may have been to destroy prejudices. The human understanding had been forced into strange postures by absurd beliefs that each generation had drilled into it from its infancy by the terrors of superstition and the dread of tyranny; and the destruction

of prejudices enabled it to *stand up straight*, so to speak.

Errors in politics and in morals all arise from philosophical mistakes, which are connected with scientific errors. Every single religious system, every supernatural extravagance, is based on ignorance of the laws of nature. The inventors and defenders of these absurdities couldn't foresee the gradual improvement of the human mind. Convinced that the men of their time knew everything they could ever know and would always believe what they believed then, they confidently relied for their fantasies on the current opinions of their country and their time.

The advances in physics are all the more fatal to these errors because •they often destroy them without seeming to attack them, and •they subject those who obstinately defend the errors to the taunting label 'ignorant'.

At the same time the practice of reasoning soundly on the topics of these sciences, and what their methods provide in the way of precise ideas and ways for recognising or proving truths, must naturally lead us to contrast the frame of mind •that forces us to stick to opinions based on these real sources of credibility with the one •that attaches us to our habitual prejudices or forces us to yield to authority. This contrast is all we need to become suspicious of the latter opinions, to give us a sense that *they aren't really believed*, even when belief in them is proudly proclaimed and declared with the purest sincerity. When this secret is discovered their abolition follows quickly and inevitably.

In short, this progress of the physical sciences, which aren't disturbed by passions or self-interest, and don't allow that someone who can't *understand* a given topic is nevertheless entitled by his birth, profession, or government position to *make judgments* about it, couldn't have been observed if enlightened men hadn't kept working to bring the other sciences closer to the physical

sciences. The latter's progress at every step offers these men the model they ought to follow, a standard by which they could

- judge their own efforts,
- recognise the wrong routes they could have taken,
- preserve themselves from pyrrhonism as well as from credulity, and from a blind mistrust or a too complete submission to the authority even of men with knowledge and renown.

Metaphysical analysis doubtless would have led to the same results, but it would have provided only abstract principles. In the physical sciences the same abstract principles, put into action, are clarified by examples and strengthened by success.

Until this ninth era the sciences had been the birthright of only a few; now they had become common property, and the moment was approaching in which their elements, their principles and their simplest methods would become really popular. That is when their usefulness—to the arts and to the general health of men's minds—would be truly universal.

I'll trace the advances of European nations in infant and adult education. Up to now the advances haven't amounted to much, if we attend merely to the philosophical **system** of this education, which has nearly everywhere been given over to scholastic prejudices; but they have been very rapid if we consider the extent and nature of the **content**, which now includes hardly any knowledge that isn't real, and takes in the elements of almost all the sciences; while men of all ages find in dictionaries, abstracts and journals the knowledge they need, although it isn't always of the purest kind. I'll look into what the usefulness is, in the sciences, of adding oral instruction to the instruction that comes straight from books and study; and into whether any benefit has come from the fact that the assembling of anthologies

has become a real *trade*, a way of earning a living, which has multiplied the number of inferior works but has also multiplied uneducated people's means of acquiring common knowledge. I'll expound the influence that learned scientific societies have exercised on the advances of the human mind, a barrier that will be useful, for a long time yet, to hold off fraud and false scholarship. And, lastly, I'll present the history of the encouragements given by governments to the advances of the human mind, and of the obstacles they have put up to them, often in the same country at the same time. I shall show what prejudices or machiavellian principles have directed governments in this opposition to the journey of minds towards truth; and what views of political interests, even of public good, have been at work when they have seemed rather to want to speed and protect the journey.

·ADVANCES IN THE FINE ARTS·

The picture of the fine arts offers results that are no less brilliant. Music has become (in a way) a new **art**, while the science of combinations and the application of mathematics to the vibrations of sounding bodies and waves in the air have clarified its **theory**. The graphic arts, which had already passed from Italy to Flanders, Spain and France, were raised in France to the same level they had had in Italy in the preceding era, and were acclaimed even more strongly than they had been in Italy itself. The art of our painters is that of Raphael and the Carracci family. All the means of that art have been preserved in the schools; far from being lost, they have spread. But it's a long time since any genius comparable with them has appeared—too long for this period of sterility to be attributed to chance. It's not because the methods of graphic art are exhausted, though it really has become harder to achieve great success in it. Nor is it because nature has denied us organs as perfect as

those it gave the Italians of the 16th century. It is solely to changes in politics and *mœurs* that we should attribute not the decay of the art but the mediocrity of its productions.

Literary productions (cultivated in Italy with less success, but without having degenerated there) have made advances in the French language, advances which have entitled it to the honour of becoming, in a way, the universal language of Europe.

The art of tragedy in the hands of Corneille, Racine and Voltaire has been raised step by step to a previously unknown level of perfection. Comedy is indebted to Molière for having more quickly reached a level not previously achieved by any nation.

The English language was perfected from the start of this ·ninth· era, as was the German language more recently. ·In both languages· the art of poetry as well as that of prose writing have been brought—though less completely than in France—under the **universal rules** of reason and nature that ought to direct them. These rules are equally true for all languages and all peoples, though up to now few men have been able to know them and rise to the sound and sure *taste* that is nothing but a sense of those rules. That sense presided over the compositions of Sophocles and Virgil, as well as those of Pope and Voltaire; it taught the Greeks and Romans, as well as the French, to be struck with the same beauties and shocked by the same faults.

I shall show what it is in each nation that has helped or hindered the advances of these arts; by what causes the various kinds of poetry or prose-works have reached such different levels in the different countries; and how these **universal rules** can, while remaining true to their own fundamental principles, be modified by the *mœurs* and opinions of their intended audience, and even by the uses to which their different genres are to be put. Thus, for

example, a tragedy declaimed in daily performances before small audiences in a small theatre couldn't follow the same practical rules as a tragedy sung on an immense stage in solemn festivals to which the whole populace was invited. I'll try to show that the rules of taste are like the other laws of the moral and physical universe in •in their generality and constancy and in •the kind of modifications they are open to when they have to be applied in the practice of some common art.

I'll show •how printing, publishing and disseminating works—even ones intended to be publicly read or recited—enables them to reach incomparably many more readers than they'll have hearers; •how, because nearly all the important decisions by large assemblies were taken after the members had been briefed *in writing*, the rules for the art of persuasion among the moderns were bound to be different from those for the ancients, matching the differences in the effect aimed at and the means employed; and lastly •how those rules differ ·between ancients and moderns· even for matters—such as history and philosophy—where the ancients also relied on reading, because the invention of printing made it easy for the moderns to learn about more developments and get more details.

The advances in philosophy and the sciences have helped and extended the advances of literary pursuits, and these have served to make the study of the sciences easier and philosophy more popular [see Glossary]. There has been mutual help between the sciences and philosophy on one hand and literary pursuits on the other, despite the efforts of ignorance and folly to disunite them and make them enemies. Scholarship, with its obedience to human authority and respect for anything ancient, seemed sure to support the cause of harmful prejudices; but in fact scholarship has helped to destroy them, because the sciences and philosophy

have lent it the torch of a sounder criticism. It already knew about weighing and comparing authorities, but now at last it has submitted them to the tribunal of reason. It had rejected miracles, absurd tales, factual claims contrary to probability; but now in attacking the testimony on which these relied it has learned to reject that testimony, however much of it there is, unless it outweighs the physical or psychological improbability of the extraordinary factual claim in question.

Thus, all men's intellectual occupations—however different in topic, method, or mental qualities required—have collaborated in the advances of human reason. In fact the entire system of human intellectual achievement is like a single well-built piece of work: its parts, though carefully distinguished from one another, must nevertheless be closely connected so to form one whole and work towards one goal.

Surveying the human species, I'll show that

- the discovery of true methods in all the sciences,
- the scope of the theories they include,
- their applicability to all natural objects and all human needs,
- the lines of communication established among them,
- the great number of people who cultivate them, and
- the spread of printing presses,

are sufficient to assure us that no science will ever sink below the level to which it has been carried. I'll show that the principles of philosophy, the maxims of liberty, and the knowledge of the true rights and real interest of man are spread through too many nations, in each of which they direct the opinions of too many enlightened men, for them ever to fall back into oblivion.

The two most widely used languages—French and English—are those of the two peoples who have the most complete liberty, and have best known the principles of liberty; so that no confederacy of tyrants, nor any possible

political conspiracy, can prevent the rights of reason and of liberty from being openly defended in both languages. So what is there to fear now?

But if everything assures us that the human race won't relapse into its former barbarous state; if everything ought to guarantee us against that feeble and corrupt system that condemns mankind to eternal oscillations between truth and error, liberty and servitude; still we see enlightenment spreading over only a small part of our globe, and the number of those who are really enlightened *vanishing* when set alongside the mass of men who are given over to ignorance and prejudice. We see vast territories groaning under slavery, containing only nations degraded by the vices of a civilisation that can't progress because it is so corrupt and nations still vegetating in the infancy of their first eras. We see that the exertions of these last ages have done much for the progress of the human mind but little for the perfection of the human species; much for man's glory, something for his liberty, but hardly anything yet for his happiness. At a few points our eyes are struck with a dazzling light, but thick darkness still covers an immense horizon. The philosopher's soul can peacefully take satisfaction in a few things, but more often it is afflicted by the spectacle of stupidity, slavery, wildness and barbarism. The only way a friend of humanity can have unmixed pleasure is by abandoning himself to hopes of a lovely future.

Such are the topics that belong in an historical picture of the advances of the human mind. In presenting them I shall aim to emphasise the influence of these advances on the opinions and the welfare of the general mass of the various nations in the different eras of their political existence; to show on one side

- what truths they have known,
- what errors they have been cured of,

- what virtuous habits they have acquired,
- what new improvements have brought their faculties nearer to satisfying their needs;

and on the other side

- what prejudices have enslaved them,
- what religious or political superstitions have been introduced,
- what vices they have been dragged down to by ignorance or despotism,
- what miseries they have suffered through violence or their own degradation.

Until now political history, like the histories of philosophy and the sciences, has been merely the history of a few men; the real substance of the human species, the mass of families that live almost entirely on their labour, has been forgotten; and even in the class of those who follow public professions—acting not for themselves but for society, their occupation being to instruct, govern, defend and comfort other men—only the chiefs have attracted the attention of historians.

·THE HISTORY OF MASSES OF MEN·

For the history of individuals, all one needs is to collect facts; but the history of a mass of men has to rely on observations [see Glossary]; and in order to select these and grasp their essential traits the historian needs to have considerable knowledge already, and to make a proper use of them he needs philosophy.

Another point: these observations relate to common things that are perfectly visible; anyone who wants to can find out about them for himself. So nearly all that have been collected have come from travellers, because things that are very trivial in the place where they exist have aroused the curiosity of foreigners. Unfortunately these travellers

are nearly always inaccurate observers; they see objects too quickly, *through* their own country's prejudices and often *by* the eyes of the locals. They consult people they *happen* to meet, and the answers they get are nearly always dictated by the answerer's self-interest, party spirit, national pride, or mood.

So it's not only because of historians' servility (historians of monarchies have rightly been criticised as servile) that we don't have ·literary· monuments from which to trace this most important part of the history of men.

The gap can be filled only very imperfectly by knowledge of **(i)** laws, **(ii)** practical principles of government, **(iii)** public economy, **(iv)** religions and **(v)** general prejudices. In fact the differences between

- (i)** the written law and the actually applied law,
- (ii)** the principles of those who govern and the way their governing is shaped by the frame of mind of the governed,
- (iii)** the institution in the minds of the men who formed it and the actual institution that results,
- (iv)** the religion of the books and the religion of the people, and
- (v)** the apparent universality of a prejudice and the facts about who actually has it

can be so great that there comes to be absolutely no match between the effects and these public and known 'causes'.

This part of the history of the human species—the most obscure, the most neglected, and the least supported by records—is what should be emphasised most in the picture I am drawing; whether the topic is a new discovery, an important theory, a new system of laws, or a political revolution, the task will be to discover what its effects must have been on the most numerous portion of each society; for *that* is the true topic of philosophy, since all the intermediate effects

of these same causes can only be regarded as means of eventually acting on this portion of humanity that truly constitutes the mass of the human race.

It is when we reach this last link of the chain that the observation of past events, as well as the knowledge acquired by meditation, become truly useful. It is when we arrive at this stage that men can appreciate their real claim to glory, or get durable pleasure from the advances of their reason; only then can anyone judge regarding the true improvement of the human species.

This idea of relating everything to this last point—i.e. to the welfare of the mass of people—is dictated by justice and by reason. One might be tempted to regard it as chimerical,

but it isn't; and it will be enough here to show this by two striking examples.

First, the man who cultivates the soil has an abundance of food to meet his needs; he owes this to the continued exertions of industry aided by scientific knowledge; so ultimately he owes it to the victory of the Greeks over the Persians in the battle of Salamis, without which the darkness of oriental despotism threatened to cover the whole of the earth. Second, the sailor who is saved from shipwreck by the accurate observation of *longitude* owes his life to a theory that descends, through a chain of truths, from discoveries made in the school of Plato and buried for twenty centuries in total disuse.

Tenth era

Future advances of the human mind

If man can predict with almost perfect certainty phenomena whose laws he knows; and if, even when he doesn't know those laws, experience of the past enables him to foresee future events with high probability; why would it be thought fanciful to try to draw a plausible picture of what lies in store for mankind, on the strength of its past history? The sole basis for trust in the natural sciences is the thesis that the general laws governing the phenomena of the universe are necessary and constant, whether or not we know them; why shouldn't this principle hold just as well for the development of man's intellectual and moral faculties as it does for the other operations of nature? Given that the wisest men are guided in their conduct solely by opinions based on past experience of similar situations, why shouldn't the philosopher be allowed that same basis to support his conjectures,

as long as he doesn't claim for them more certainty than is warranted by the number, consistency and precision of the relevant observations?

Our hopes for the future state of mankind come down to three points: **[A]** the destruction of the inequality among nations, **[B]** advances in equality within individual nations, and **[C]** the real improvement of mankind. Aren't all nations bound some day to approach the state of civilisation reached by the peoples who are most enlightened, most free, most clear of prejudices, e.g. the French and the Anglo-Americans? The chasm separating these peoples from the slavery of countries subjected to kings, the barbarity of African tribes and the ignorance of savages—mustn't it gradually vanish?

[A] Are there territories on the globe whose inhabitants are condemned by nature never to enjoy liberty, never to

exercise their reason?

[B] The difference in knowledge, means and wealth that has so far been visible in all civilised nations, between the different classes making up each nation—what is the status of this inequality that the earliest advances of society have increased (one might almost say ‘have *produced*’)? Is it integral to civilisation as such, or is it one of the imperfections of the social art? Is it on course to lessen continually, being replaced by the chief goal of the social art, namely the actual equality that lessens even the effects of the *natural* differences in people’s faculties and leaves standing only such inequality as is useful to everyone because it favours civilisation, education and industry, without creating dependence, humiliation or poverty? In short, are men approaching a state in which everyone will know what he needs to know for leading his everyday life on the basis of his own reason, and for keeping that reason uncontaminated by prejudices; for knowing his rights and exercising them according to his opinions and his conscience; a state in which everyone will be able by the development of his faculties to earn a secure livelihood; a state in which folly and misery will be only ‘occasional’ accidents and not the permanent state of a considerable portion of society?

[C] Finally, is the human race going to become better, either

- through new discoveries in the sciences and the arts, resulting in improvements in individual well-being and general prosperity; or
- by making further advances in the principles of conduct and in moral practice; or
- by real improvement of our moral, intellectual and physical faculties?

That last one might result from any of three improvements: in the instruments that increase the power of those faculties,

in the instruments that direct the faculties’ use, or in the natural organisation of the faculties themselves.

In answering these three questions we’ll find the strongest reasons—from past experience, from observation of the advances that the sciences and civilisation have made up to now, and from analysing the journey of the human mind and the development of its faculties—to believe that nature has set no limits to what we can look forward to.

[A] Inequality among nations

If we take a quick look at the present state of the globe, we’ll see right away that in Europe the principles of the French constitution are already those of every enlightened man. We’ll see them too widely disseminated there, and too openly professed, for tyrants and priests to block them from gradually penetrating the hovels of their slaves; and there they’ll soon awaken the remnants of ‘the slaves’ good sense, and arouse in the soul of the oppressed the silent indignation that a life of humiliation and terror can’t extinguish.

Looking then at the different nations we’ll see what particular obstacles each of them poses to this revolution and what particular factors favour it. We’ll pick out ‘those where it is on course to come about gently through the (perhaps already overdue!) wisdom of their governments, and ‘those that will be dragged into swift and terrible events because the revolution has been made violent by their governments’ resistance to it.

Can it be doubted that either the good sense or the senseless rivalries of the European nations, co-operating with the slow but unstoppable effects of the advances of their colonies, will soon produce the independence of the new world? and that then the European population ‘of those former colonies’, rapidly spreading across that enormous

territory, will either civilise the savage nations still occupying immense tracts of it or peacefully cause them to disappear?

Survey the history of our enterprises and establishments in Africa or in Asia and you'll see

- our trade monopolies,
- our treachery,
- our blood-soaked contempt for men of a different colour or creed, and
- the insolence of our usurpations,
- the wild proselytising of our priests, or their intrigues

destroying the feeling of respect and good-will that had initially been won by the superiority of our knowledge and the benefits of trade with us.

But no doubt the moment is coming when we'll stop presenting ourselves to these people only as corruptors or tyrants and will become for them sources of benefit or warm-hearted liberators.

The sugar-growing industry that is now being established in Africa will put an end to the shameful robbery by which that enormous continent has been corrupted and depopulated through two centuries.

Already in Great Britain some friends of humanity have set the example; and if the force of public thinking has restrained that country's machiavellian government from opposing it, what may we not expect from this same source when the reform of a servile and venal constitution leads to a government worthy of a humane and good-hearted people? Won't France be eager to imitate enterprises dictated equally by Europe's philanthropy and its *true* self-interest? Spice-trading has already been introduced into the French islands, Guiana, and some English settlements; and we'll soon see the collapse of the spice monopoly that the Dutch have maintained by so much treachery, oppression and crime. The nations of Europe will eventually learn that

trading monopolies are merely a tax imposed on a nation's people to give their government a new instrument of tyranny.

Then the Europeans, settling for free trade and too enlightened about their own rights to treat the rights of others lightly, will respect the independence that until now they have so insolently violated. Their settlements, instead of being filled by

government hirelings who rush to exploit their position or their privilege in committing robbery and treachery to amass wealth with which to buy honours and titles back in Europe,

will be staffed with

hard-working men who will go to those pleasant climates in search of the comfortable way of life that they couldn't find in their native country.

They will be kept there ·in the colonies· by liberty; ambition will stop calling them back to Europe; and those counting-houses of robbers will become colonies of citizens who will disseminate through Africa and Asia the principles and the example of Europe's liberty, enlightenment and reason. Also

the monks who bring to these peoples nothing but shameful superstitions, and who antagonise them by threatening them with a new tyranny

will be replaced by

men who busy themselves spreading among these nations truths that serve their happiness, and enlightening them about their interests as well as their rights.

Zeal for the truth is one of the passions; and when it stops seeing itself surrounded by gross prejudices to combat and shameful errors to dissipate it will naturally extend its efforts to distant parts of the earth.

These immense lands will offer to it—i.e. to the zeal for the truth·—in some places **(i)** numerous peoples that seem

to need, in order to be civilised, only •for us to give them the means for this and •for the Europeans to treat them as brothers so as to have them as friends and disciples; in others **(ii)** nations ground down by religious despots or stupid conquerors, having spent centuries calling for liberators; in others again either **(iii)** nearly savage tribes whose harsh climate has •blocked them from having the gentle pleasures of a polished civilisation and •deterred those who would have liked to help them in this from making the attempt, or **(iv)** conquering tribes that know no law but force and no profession but piracy. The advances of **(iii)** and **(iv)** will be slower and more tempestuous; it may even happen that, reduced in numbers as they see themselves repelled by civilised nations, they will in the long run gradually disappear, or blend in with their neighbours.

I'll show how these events will be the inevitable consequence not only of Europe's advances but of the freedom that the French and North American republics *can* and in their own interests *should* give to trade with Africa and Asia—i.e. how they must necessarily result from the European nations' new-found wisdom or from their obstinate adherence to mercantile prejudices.

I'll show that the only event that could block this revolution would be a new invasion of Asia by the Tartars [here = roughly 'Turks and Mongols'], and that this won't again be possible. Meanwhile everything is working towards the early collapse of the great religions of the East. These have been abandoned to the people nearly everywhere, share the low moral level of their ministers, and in many regions are already regarded by those in power as mere political institutions; they no longer threaten to keep human reason in hopeless slavery and endless infancy.

The progress of these peoples will be faster and steadier than ours has been, because •they will get from us what

we had to discover for ourselves, and because •for them to know the simple truths and reliable methods that we arrived at only through many errors all they'll need is to grasp their proofs and their developments in what we say and write. If the advances of the Greeks were lost on other nations, the blame for that lies with lack of communication between peoples and with the tyrannical domination of the Romans. But when mutual needs bring all men closer together, so that the most powerful nations will count among their political principles equality among societies as well as among individuals, respect for the independence of weak states as well as compassion for ignorance and wretchedness; when maxims that tighten the mainspring of the human faculties are replaced by ones that favour releasing it into action and energy; will it still be reasonable to fear that some parts of the globe are inaccessible to enlightenment, or that the pride of despotism will be able to go on for long putting up insurmountable barriers to the truth?

So the time will come when the sun shines only on men who are free and acknowledge no master except their reason; when tyrants and slaves, priests and their stupid or hypocritical instruments, will exist only in history books and on the stage; when we'll give no thought to them except for •pitying their past victims and dupes, and •keeping watch for any new sprouting of the seeds of superstition and tyranny, so that if they dare to re-appear we can recognise them and stamp them down by the weight of reason.

[B] Inequality within individual nations

In surveying the history of societies I'll have had occasion to remark that there is often a big gap between the rights that the law grants to the citizens and the rights they really enjoy, between the equality that political institutions establish and

the equality there is among individuals; and that this gap was a leading cause of the destruction of liberty in the ancient republics, the storms they went through, and the weakness that delivered them into the hands of foreign tyrants.

These discrepancies have three principal causes: **(a)** inequality of wealth, **(b)** inequality of status between •someone whose means of subsistence are secure for himself and will be inherited by his family and •someone whose resources depend on the length of his life or rather of the part of his life in which he can work, and lastly **(c)** inequality of education.

So it will have to be shown that these three kinds of real inequality must continually lessen—but without vanishing, for they have natural and necessary causes that it would be absurd and dangerous to try to destroy. Even *trying* to abolish their effects entirely would let loose more harmful sources of inequality, attacking the rights of man more directly and fatally.

·(a) INEQUALITY OF WEALTH·

It is easy to prove that fortunes naturally tend to be equal, and that their extreme disproportion couldn't exist or couldn't last long if

- civil laws didn't introduce artificial means of perpetuating them and combining them;
- complete freedom of commerce and industry abolished the advantages that every restrictive law, every fiscal privilege, gives to those who are already rich;
- there weren't taxes on contracts, restrictions on the freedom to make them, tiresome formalities regarding them, uncertainty and expenses in having them enforced—all suppressing the poor man's activity and swallowing up his pitiful capital;

- public administration didn't open to some men abundant sources of wealth that are closed to all the other citizens;
- marriages weren't presided over by elderly people's spirit of greed and other prejudices;
- the simplicity of our *mœurs* and the wisdom of our institutions stopped wealth from operating as the means of gratifying vanity or ambition, but didn't favour an ill-judged austerity that would •forbid the use of wealth to pay for delicate pleasures and thus •lead to the hoarding of wealth.

·(b) INEQUALITY OF STATUS·

Let us compare the present populations of the enlightened nations of Europe with the extent of their territories. As we look at their agriculture and industry, let us observe how •labour and •the means of subsistence are distributed; we'll see that it would be impossible to maintain these means at the same level (and thus to maintain the same size of population) if many individuals stopped having to depend, for almost the whole upkeep of themselves and their families, on •their own work and •the equipment they have bought to make the work possible or to make it more productive. Now, these two resources depend on the family-head's remaining alive and indeed in good health. What he has is a sort of annuity, or something even more chancy than that; which creates a very real difference between this class of men and the class whose resources are not subject to the same risks because their needs are met by income from land or by interest on capital that depends hardly at all on their work.

So there's an inevitable cause of inequality, dependence, and even of misery, which ceaselessly threatens the most numerous and most active class of our societies.

I'll show that this inequality can be vastly reduced by setting chance against chance:

- securing for someone who grows old a support arising from his savings but augmented by the savings of others who made the same sacrifice of savings to a common fund but died before they needed it;
- procuring, in a similar way, compensation for widows and fatherless children, with the costs and benefits not being affected by the man's age at death; and
- preparing for young folk who reach the age of working for themselves and starting their own family the benefit of the capital—e.g. to buy equipment—that they need to get started on work. . . .

The idea of these procedures comes from the application of mathematics to the probabilities of life and investment of money. The procedures have already been employed with success, though never with the scope or the variety of forms that would make them truly beneficial not merely to some individuals but to the whole mass of society, delivering them from that periodical ruin that afflicts so many families and is the ever-recurring source of corruption and misery.

I shall show that these schemes, which can be one of government's benefactions, can also come from private associations that it will be safe to institute once the principles by which the schemes should be organised become more popular, and the errors that have led to the downfall of many such associations no longer have to be feared.

I'll expound other means of securing this equality:

- preventing credit from being a privilege so exclusively attached to large fortunes, yet providing an equally solid basis for it;
- making the advances in industry and the activity of commerce less dependent on the existence of great capitalists. These means also will be due to the application of mathematics.

(c) INEQUALITY OF EDUCATION

The educational equality that we can hope to attain, and that ought to be sufficient, is that which excludes all *dependence*, whether forced or voluntary. I'll show that in the present state of human knowledge this can easily be achieved even for those who can devote only a few years of childhood to study and will have only odd hours of leisure during their adult lives. I'll show that by a good choice of subjects to be taught and methods of teaching them the entire mass of a populace can be instructed in everything that each man needs to know for

- managing his household, administering his affairs, freely developing his work and his faculties, knowing what his rights are, and exercising and protecting them;
- knowing what his duties are and being able to perform them well, judging his own actions and those of others by his own lights, and being capable of all the dignified or delicate sentiments that honour human nature;
- not depending *blindly* on those to whom he is obliged to entrust the care of his interests or the exercise of his rights;
- being in a position to choose them and then supervise them, so as no longer to be duped by the popular [see Glossary] errors that torment a man's life with superstitious fears and flimsy hopes;
- defending himself against prejudices purely by the forces of his reason; and finally
- escaping from the magic-tricks of charlatanism that would set traps for his fortune, his health, his freedom of opinion and of conscience, on the pretence of enriching, healing and saving him.

[In that last item, note how the three traps line up with the three pretences.]

When that happens, the inhabitants of one country will no longer be distinguished from one another by the elegance or earthiness of their way of speaking, can be equally governed by their own understandings, will have knowledge of more than merely the mechanical processes of an art or the routine of a profession, and will no longer depend, in the most trifling affairs or for the slightest information, on clever men whose skill puts them in charge (there inevitably *will* be such men). And then a real equality must result, because the difference of knowledge and talents can no longer place a barrier between men whose sentiments, ideas and language allow them to understand one another; some of whom may *want to be educated* by others but won't *need to be led* by them; some may want to delegate to others, more enlightened, the responsibility for governing them, but they can't be forced to hand over this responsibility with blind confidence.

That is when this superiority—the inevitable intellectual superiority of some men over others—will become an advantage even for those who don't have it, because it will exist for them and not against them. Natural difference of faculties among men whose understandings haven't been cultivated produces—even among savages—charlatans and dupes, clever men and ones who are easily deceived; the same difference will doubtless exist among a people where education is truly general, then it will be a difference

between •enlightened men and •men with sound minds who sense learning's value but aren't dazzled by it;
between •talent or genius and •the good sense that knows how to appreciate and enjoy these;

and even if this difference were greater—looking only at the power and scope of the faculties—it wouldn't force itself on people's notice if they attended only to its effects on interpersonal relations in matters concerning their independence and their happiness.

These various causes of equality don't act separately; they unite, meld together, support one another, and their combined influence is stronger, surer and more constant. If education is more equal, that gives rise to more equality in work, and from that comes more equality in wealth; equality in wealth must contribute to equality of education; and equality among peoples both helps and is helped by equality within a single people.

In short, properly directed education corrects the natural inequality of the faculties rather than increasing it, just as good laws remedy the natural inequality of the means of subsistence; and just as, in societies whose institutions bring about this equality, liberty—though regulated by law—will be more extensive, more complete, than in the unregulated independence of savage life. *Then* the social art will have achieved its goal, namely securing and extending for everyone the enjoyment of the common rights they are called to by nature.

[C] The perfecting of the human species

I have been showing that we can have almost sure hope of certain advances. The real advantages that must result from them can't be limited by anything except whatever limits there are to the perfecting of the human species. Why? Because in proportion as different kinds of equality equip the species with greater means for meeting our needs, with more universal education, and with more complete liberty, the more *real* this equality will be, and the closer it will come to taking in everything truly important to men's happiness.

So the only way we can know how much we can hope for—what limits there are to the benefits we can come to enjoy—is by examining the course of this perfecting of the human species and the laws governing it.

No-one has ever thought that the human mind could grasp all the facts of nature, complete precision in the measuring and analysing those facts, all the ways in which objects are inter-related, and all the possible combinations of ideas. The mere relations of sizes—the combinations of this one idea of quantity or extent—form a system that is too immense for man's mind ever to grasp it all; however much of it he comes to penetrate, more than that will always remain unknown to him. But it has been found credible that we'll eventually come to a dead-end: that man, being able ever to know only a part of the topics that the nature of his intelligence permits him to understand, must eventually reach a limit, where the number and complexity of the facts he already knows have absorbed all his powers so that further progress will become absolutely impossible for him.

But that is not clearly right because

- as the range of known facts grows, men become correspondingly better at classifying them and reducing them to more general facts;
- at the same time the instruments and methods for observing and measuring them exactly become more precise;
- as more and more relations are discovered among more and more objects, men manage to reduce them to more general relations and express them in simpler language, presenting them in a way that enables more of them to be grasped without any increase in intellectual power or intellectual effort;
- as the mind comes to understand more complex constructs of ideas, simpler formulae will soon reduce their complexity;

and the upshot of all this is that truths the discovery of which required the greatest efforts—truths that at first couldn't

even be understood except by deep thinkers—soon come to be expounded and proved by methods that are within the reach of average intelligences. And if the methods that led to new combinations come to be exhausted, if the use of them to deal with still unanswered questions demands from scientists more time or more intellectual power than they have, simpler and more general methods come to their aid and open up a new field to high intelligence. The energy and real scope of the human intellect will stay the same; but the instruments it can use will be multiplied and improved, and the language that fixes and determines ideas will be able to acquire more precision and generality. Unlike the situation in mechanics, where you can't increase the force without reducing the velocity, these methods that will direct high intelligence in the discovery of new truths will increase equally the force and the speed of its operations.

In short, because these changes are themselves the inevitable upshot of progress in the knowledge of detailed truths, and because the cause that creates a need for new resources produces at the same time the means of supplying them, it follows that the sheer content of the truths forming the system of the sciences of observation, experiment and calculation could increase endlessly, even if man's faculties retained the same strength, activity and extent.

Applying these general reflections to the different sciences, I shall present for each science examples of this progressive improvement—examples that will leave no doubt that more improvements lie ahead. I shall make a special point of noting, with regard to sciences that prejudice regards as nearest to the end of their tether, the possible advances that are the most probable and the nearest in time. I shall expound all the ways in which a more general and more philosophical application of the mathematical sciences to all branches of human knowledge are bound to increase the

scope, precision, and unity of the system of that knowledge. I shall point out

- how our hopes would be greater if in each country education were more universal, giving to more people the elementary knowledge that might inspire them with a taste for a particular kind of study and the ability to make advances in it;
- how greatly these hopes would be further strengthened if more general affluence enabled more people to devote themselves to such study—because at present, even in the most enlightened countries, of those to whom nature has given the required talents barely one in fifty gets the education needed to develop them; and thus
- that correspondingly more people would be on course to make discoveries that would push back the frontiers of science.

I'll show •how much this educational equality, combined with the coming equality among different nations, would speed those sciences whose advances depend on observations repeated more times over larger stretches of territory; •all the benefit that this would bring to mineralogy, botany, zoology and meteorology; in short, •what a vast difference there is between the feeble means now available to these sciences (though they have led to useful and important truths) and the means that man would then have at his disposal.

I shall reveal how much, even in the sciences where discoveries are the reward of individual meditation, the advantage of being pursued by more people could also contribute to their advances by improvements in the details—things of sorts that can arise from simple thinking and don't require the strength of intellect needed for discoveries.

If we pass now to the arts [see Glossary] whose theories

depend on these same sciences, we'll see •that their theoretical advances can march with those of the sciences, not having any other limits; •that the procedures of the arts are capable of the same improvements and simplifications as the methods of the sciences; •that instruments, machines and looms will go on adding to man's power and skill, increasing the excellence and precision of the things he makes while reducing the amount of the time and labour needed to produce them. When all that happens, that will be the end of the obstacles that still stand in the way of those advances, obstacles such as accidents that men will learn to foresee and prevent, and the unsanitariness of certain operations, work-habits and climates.

Provisions of higher value or greater utility will be extractable from smaller and smaller portions of ground; more goods will be obtainable at less expense; the same manufactured article will require less destruction of raw materials or will be stronger and more durable. Men will be able to choose for each kind of soil the use of it that will do most to satisfy people's needs; and to choose, among different productions that meet the same need, the ones that will provide for the most people at the lowest cost. Thus, advances in the arts of producing and preparing materials and making things from them will bring with them cost-free improvements in the means of conservation and of frugality.

Thus, not only will the same ground feed more individuals, but each individual's work will be more productive—because less *grinding*—and so will satisfy more needs.

•GLOBAL OVER-POPULATION•

In these advances in industry and well-being, leading to a better relation between what men need and what they can do, each successive generation will have (either from its own advances or from the products of previous generations)

more usable goods than its predecessors; this will lead to an ever-rising level of health and thus to an ever-growing population. So a certain line of questioning arises:

- Wouldn't a point be reached at which these necessary laws of improvement and increase came into conflict?
- Wouldn't the ever-increasing population eventually outrun the means of production, so that there would be if not a continual loss of population and loss of well-being then at least a sort of oscillation between good and bad?
- And wouldn't that, in societies that reached this point, be a perennial source of intermittent misery?

Wouldn't this mark the limit beyond which no further improvement in the human condition would be possible? the point that the perfectibility of man would reach after ever so many centuries but wouldn't ever be able to get past?

Everyone can see that this point lies very far in the future; but aren't we bound to reach it some day? Well, if event E couldn't occur except at a time when the human species had acquired a level of knowledge and understanding that we today can scarcely form an idea of, we today can't possibly know that E will occur—or that it won't. Who would be so bold as to guess *now* what developments there will some day be in the art of converting the elements of life to our use?

And even if this limit were reached, that wouldn't lead to anything alarming for mankind's happiness or its indefinite perfectibility, if the following things are true. Before that time comes

- reason will have advanced in step with the advances of the sciences and the arts;
- the prejudices of superstition will have stopped infecting morality with a harshness that corrupts and degrades instead of purifying and exalting it;

- men will then know that if they have obligations regarding people who are not yet born, those obligations
 - will have to do not with bringing those beings into existence but with their being happy if they come into existence; and
 - will concern the general welfare of the human species or the society in which the obliged person lives or the family he belongs to, and not the puerile idea of cluttering the earth with beings who are useless and wretched.

So there might be a limit to how many people the earth can support and thus to how large the global population can be, without there being those early deaths from starvation that would be so contrary to nature and to the social prosperity of some of the beings who have received life.

•IMPROVEMENTS IN METAPHYSICS, MORALS AND POLITICS•

The discovery (or rather the accurate analysis) of the basic principles of metaphysics, morals and politics is still recent, and it was preceded by knowledge of very many truths of detail; so it is easy to think that those three disciplines have now reached their destination; the prejudice has arisen that nothing remains to be done in them because there are no longer any gross errors to destroy or basic truths to establish.

But it is easy to see •how far we are from fully understanding the intellectual and moral faculties of man; •how greatly knowledge of his duties, which requires knowledge of how his actions will affect the welfare of his fellow creatures and of the society he belongs to, can be increased by a steadier, deeper and more accurate observation of that action-to-upshot relation; •how many questions still have to be answered, how many social ties have to be examined, before we can have precise knowledge of the individual rights of man and of the rights that the social state confers on the

whole community with regard to each member. Have we yet even set with any precision the limits of these rights, whether •between different societies, or •of single societies over their members in times of trouble and division, or •of individuals and of free associations at the time of their first formation or of their having to be dissolved?

If we pass now to the theory that will have to direct the *application* of these principles, serving as the basis of the social art, don't we see the need for a level of precision that these first truths—absolutely general as they are—aren't capable of? Have we reached the point where we can base our laws on either justice or proved and acknowledged utility, rather than on vague, uncertain and arbitrary views of claimed political advantages? Have we settled on precise rules to guide a confident choice, among the almost infinite variety of possible systems that would respect the general principles of equality and natural rights, the ones that best secure the preservation of these rights, give the widest scope for their exercise and enjoyment, and best promote the leisure and welfare of individuals and the strength, peace and prosperity of nations?

The application of the calculus of combinations and probabilities to these same sciences •of metaphysics, morals and politics• promises advances that will get added importance from the fact that this •calculus• is the only means of •giving their results an almost mathematical precision and of •judging how certain or probable they are. The facts that support these results may well lead—at a glance, without calculation—to some general truths, telling us whether the effects produced by such-and-such a cause are good or bad; but if these facts can't be counted or weighed, if these effects can't be subjected to exact measurement, we shan't be able to know *how much* good or bad the cause in question produces; and if the good and bad are nearly

equal, the difference between them being small, we won't even be able to say confidently which way the balance swings. Without the application of this calculus it would often be impossible to make a secure choice between two routes to a single goal when there was no obvious difference between their respective advantages. Without this •mathematical• help these sciences would remain forever crude and limited because of their lack of instruments fine enough to lay hold of the fleeting truth, of machines sound enough to get down into the depths of the mine where some of the wealth of these sciences lies hidden.

Yet this application, despite the happy efforts of certain geometers, is still in a rudimentary state, so to speak; and to future generations it must open a source of knowledge that is—like the calculating science itself, and like the combinations of relations and facts that it can be applied to—truly inexhaustible.

Another kind of progress that these •three• sciences can make is equally important—the perfecting of their language, which is so vague still and so obscure. It's through this improvement that the sciences can become truly popular [see Glossary] even in their basic elements. Someone who is •highly trained and• highly intelligent can triumph over the inexactitude of scientific language, as he can over other obstacles; he recognises the truth despite of the •linguistic• mask that conceals or disguises it. But what about the man who can spend only a few leisure moments on his education—how can *he* acquire and retain even the simplest truths if they are disguised by inaccurate language? The fewer ideas he is able to collect and combine, the greater his need for them to be sound and precise. He doesn't have stored in his mind any system of truths to defend him against error; and his understanding, not being strengthened or refined by long exercise, cannot catch the feeble rays of

light that escape through the obscurities and ambiguities of an imperfect and perverted language.

·MORAL SCIENCE AND MORAL PRACTICE·

When men become enlightened about the nature and development of their moral sentiments, the principles of morality, the natural motives that prompt them to act morally, and their interests as individuals or as members of society, they will inevitably make advances in •moral practice that are as real as those they make in •the science of morality. Isn't a mistake about our interests the most frequent cause of actions contrary to the general welfare? Isn't the violence of our passions often the effect of •habits that we have acquired only through false calculations or of •ignorance of the means by which to resist the passions at their outset so as to tame them, steer them, direct their action?

Isn't the practice of

- reflecting on one's own conduct,
- listening to the deliverances of reason and conscience upon it, and
- having gentle feelings that don't distinguish one's own happiness from that of others

—isn't all this an inevitable result of **(a)** the well-directed study of morality and of **(b)** greater equality in the conditions of the social compact? Won't **(b)** the free man's sense of his own dignity and **(a)** an educational system based on a deepened knowledge of our moral constitution have the result that almost everyone has those principles of strict and pure justice, those habitual impulses of active and enlightened benevolence, of a delicate and generous sensibility, whose seed nature has planted in our hearts and which will flower there if they get the gentle influence of **(a)** enlightenment and **(b)** liberty? Just as the mathematical and physical sciences serve to improve the arts that are employed for our simplest

needs, isn't it equally part of nature's necessary order that advances in the moral and political sciences should serve to improve the motives that direct our feelings and our actions?

What is achieved by the improvement of laws and public institutions that comes from the advances of these sciences except to bring •the common interest of each individual closer to—to make it *identical* with—•the common interest of all? Isn't the goal of the social art to destroy the seeming opposition between these? And won't the country whose constitution and laws accord best with the demands of reason and nature also be the one where the practice of virtue will be easiest and the temptations to stray will be rarest and weakest? What vicious habit, what practice contrary to good faith, what *crime*, even, can't be ultimately traced back to its origin or first cause in the legislation, institutions and prejudices of the country in which the habit, practice, or crime is seen to be committed?

In short, aren't men disposed to humanity, beneficence and justice by the prosperity resulting from •the advances the useful arts make with the support of a sound theory, or •the advances sound legislation makes on the basis of the truths of the political sciences?

Don't all these observations (which I'll develop at length in the work itself) show that man's moral goodness, the necessary consequence of his constitution, is like all his other faculties capable of indefinite improvement? and that nature binds together truth, happiness and virtue by a chain that can't be broken?

·IMBALANCE BETWEEN THE SEXES·

Among the advances of the human mind that matter most to general happiness we must include the total annihilation of the prejudices that have established an inequality of rights between the sexes, an inequality that is deadly even to the

sex that it favours. It would be useless to try to justify it by differences of physical organisation, of intellect, or of moral sensibility. This inequality began as a pure abuse of strength, and subsequent attempts to excuse it by bad arguments have all been wasted breath.

I shall show how much the abolition of the practices authorised by this prejudice, and of the laws that it has dictated, can do to increase the happiness of families and spread the virtues of domestic life (which are the basis of all the other virtues); and to favour advances in education, above all making it truly *general*—because it would be extended more equally to both sexes and because it can't become general even for men without the support of the mothers of families. Wouldn't this long-overdue tribute to equity and good sense dry up a brimming well of injustices, cruelties and crimes by abolishing the dangerous opposition between •man's most vigorous and hard-to-control natural propensity and •his duties or the interests of society? Wouldn't it *at last* produce something that until now has been merely a pipe-dream? I mean: mild and pure national *mœurs*, not formed by

- proud asceticism,
- hypocritical appearances ·of sexual propriety·, or
- sexual· moderation imposed by the fear of shame or religious terrors,

but by habits freely contracted, inspired by nature and acknowledged by reason?

·THE END OF WAR·

When people are more enlightened, and have reclaimed the right to dispose of their own blood and their own goods, they'll gradually come to regard war as the deadliest scourge, the worst of all crimes. The first wars to disappear will be the ones that usurpers of national sovereignty drag their subjects into in defence of supposed hereditary rights.

Nations will know that they can't become conquerors without losing their freedom; that permanent confederations are the only way to maintaining their independence; that they should aim for security, not power. Commercial prejudices will gradually die away; false ideas about mercantile interest will lose their terrible power of drenching the earth in blood, ruining nations on the pretence of enriching them. •As the nations come closer to one another in their views on the principles of politics and morality, and •as each of them, for its own advantage, invites foreigners to have a more equal share in the benefits that nature or industry have given it, all the causes that produce, intensify and perpetuate national hatreds will gradually disappear; they'll no longer provide either fuel or pretext for the fury of war.

The advances of this brotherhood of nations will be accelerated by institutions that are better conceived than the projects of perpetual peace with which certain philosophers have filled their spare time and soothed their souls; and wars between nations will count (like assassinations) as extraordinary atrocities, humiliating and loathsome in the eyes of nature and fixing an indelible stain on the country or the age whose history records them.

·IMPROVEMENTS IN FINE ARTS AND SCIENCES·

Regarding the fine arts in Greece, Italy and France I said [page 29] that one should distinguish in their productions what really belongs to the progress of the art from what is due only to the talent of the artist. Now I shall ·turn from the past to the future and· consider what advances ·in the fine arts· may still be expected, whether because of

- advances in philosophy and the sciences,
- more observations [see Glossary], or deeper ones, concerning the goal, the effects and the means of the fine arts themselves, or

- the abolition of the prejudices that have narrowed their sphere and still hold them back by the yoke of authority from which the sciences and philosophy have broken free.

I'll look into something that has been believed, namely [to the end of this paragraph]: The means of the fine arts are bound to dry up, because •the most sublime beauties, or the most touching ones, have been taken, •the happiest subjects have been treated, •the simplest and most striking ideas have been used, •the most prominent and general characters have been portrayed, •the liveliest passions and their truest or most natural expressions, the most striking truths, and the most brilliant images have been put to work by the artists; so that the ·fine· arts, whatever growth we attribute to their means, are condemned to an eternal and monotonous imitation of their first models.

I shall show that this opinion is nothing but a prejudice born of the habit of artists and literary folk of *judging the men* rather than *enjoying their works*. The thoughtful pleasure that comes from comparing the products of different ages and countries, and from being amazed by the efforts or the success of genius, may be lost; but the pleasure to be derived from the productions themselves because of their own real perfection needn't be less lively, even in cases where the artist doesn't deserve as much credit for rising to that level of perfection. As there come to be more works that are really worth preserving, and as they become more perfect, each generation will direct its attention and admiration to those that deserve to be singled out, and the rest will gradually be forgotten; and the pleasures to be derived from the simpler and more striking beauties that were first seized on will still be had by our posterity even though those beauties are found only in more modern works.

The advances of the sciences guarantee advances in the

art of education, which then speed up those of the sciences; and this reciprocal influence, whose action is ceaselessly renewed, must count as one of the most active and powerful causes of the perfecting of the human race. A young man graduating from one of our universities today knows more in mathematics than Newton learned by profound study or discovered by the force of his genius; he can handle the instrument of calculation with an ease that was unknown back then. The same observation applies, though not quite equally, to all the sciences. The more a given science grows, the better it becomes at compressing more proofs of truths within less space, making them easier to understand. Thus, not only will this be the case for each generation:

despite the new advances in the sciences, men of equally high intelligence will at the same stage of their individual lives come to be right on top of the present state of ·the· science ·they are working on·,

but so also will this:

the amount that can be learned in a given stretch of time by the same strength of intellect and the same level of attention will inevitably increase; and the elementary part of each science—the part that *everyone* can master—will grow, coming ever closer to containing all the knowledge that everyone needs if he is to steer himself through everyday life and freely exercise his reason.

In the political sciences there's a category of truths which—particularly in free countries, i.e. some generations hence in *all* countries)—can't be useful until they are generally known and accepted. So the influence of these sciences on the freedom and prosperity of nations must be somewhat measured by how many of those truths are lodged in everyone's mind through elementary education; so the growing advances in elementary education, tied to the inevitable

advances in these sciences, provides us with a guarantee of an improvement in the lot of the human race that can be regarded as indefinite because it could only be limited by limits on those two kinds of advance.

·TECHNICAL METHODS AND UNIVERSAL LANGUAGE·

I have to address two other general means that are bound to influence improvements in both •the art of education and •the sciences. One is a broader and better use of what may be called *technical methods*; the other is the setting up of a •universal language.

By ‘technical methods’ I mean the art of bringing many objects into a systematic layout that lets one see at a glance their inter-relations, quickly grasp the complexes that they form, and more easily form new complexes from them.

I shall expound the principles of this art and bring out how useful it can be. Today it is still in its infancy, but when it is perfected it can offer us

- the advantage of presenting within the narrow compass of a *chart* material that it would often be hard to make so quickly or so well understood in a big book; and
- something even more valuable—a way to present isolated facts in the layout that is best for deriving general results from them.

It’s easy to learn how to use these charts; and I’ll show •how, with the help of a few of them, men who have been stuck at the level of elementary education, and thus haven’t been able to absorb—to *make their own*—knowledge of details that are useful in everyday life, will come to be able to lay their hand on those details as needed; and •how these •technical-methods can make elementary education easier in all the branches of it that are concerned with either a regular system of truths or a series of observations and facts.

A language is *universal* if it expresses by signs either **(i)** real **objects** or **(ii)** well-defined collections of simple and general **ideas** which are found to be the same, or can be formed equally in the understanding of all men; or **(iii)** the general relations among these ideas—the **operations** of the human mind, or the operations that specifically belong to each science or to the procedures of the arts. Thus, anyone who knew these signs, the ways to combine them and the rules for forming them would understand what is written in this language and could easily translate it into the vernacular of his own country.

Clearly this language could be used to expound either the theory of a science or the rules of an art; to report a new experiment or observation, the invention of a procedure, the discovery of a truth or of a method; and, as in algebra, when new signs have to be introduced they will be explainable in terms of the already existing ones.

Such a language doesn’t have the drawback of a scientific idiom different from the vernacular. I have remarked [page 65] that the use of such an idiom necessarily divides societies into two unequal classes—one composed of men who understand the language and thus have the key to the sciences, the other of those who have been unable to learn it and so are almost completely unable to acquire knowledge. The universal language that I am describing, on the other hand, would be learned (as the language of algebra is) along with learning the science itself; the sign would be known at the same time as the **object**, **idea** or **operation** that it stands for. Anyone who had learned the elements of a science and wanted to go further in it would find in books not only truths he could understand with the aid of the signs whose meanings he already knew but the explanation of further signs that were needed for him to go on to other truths.

I'll show •that the formation of such a language, if confined to the expressing of simple and precise propositions like those that form the system of a science or the practice of an art, is far from being a mere fantasy; •that even today it could easily be set up for many topics; and •that the chief obstacle to its being extending to others would be something that it's a bit embarrassing to admit, namely the paucity of our stock of precise ideas, accurately defined notions, understood exactly in the same sense by every mind.

I'll show how this language, with daily improvements and enlargements of its scope, would bring to every topic that comes within the reach of human intelligence a rigour and precision that would make it easy to know the truth and almost impossible to go wrong. Then each science would go forward as securely as mathematics does, and the propositions constituting its system would have all the certainty of geometry—i.e. all that is permitted by the propositions' subject-matter and method.

·IMPROVING MAN'S PHYSIQUE AND NATURAL FACULTIES·

All these causes of the improvement of the human species, all these means that ensure it, must from their very nature exert an always active influence and continually broaden their scope. I have presented the evidence for this; and when it is developed at length in the work itself it will be even stronger; so we can already conclude that man is indefinitely improvable; and we have reached this point while assuming him to go on having only the same natural faculties that he has now, as being internally organised in the same way. Think how sure we could be ·about man's future improvement·, how much we could hope for on his behalf, if we could believe that these natural faculties themselves—this organisation—could also be improved. This is the last matter that I have to examine.

The organic perfectibility or deterioration of the species of plants and animals can be regarded as one of the general laws of nature. This law extends to the human race; and surely no-one will doubt that

- advances in conservative [*conservatrice*] medicine,
- healthier food and housing,
- a life-style that develops physical powers by exercise without ruining them by excess, and lastly
- eliminating degradation's two most active causes, extreme poverty and extreme wealth,

are bound to prolong man's average life-span and secure for him better health and a sturdier constitution. We can sense that advances in preventive [*préservatrice*] medicine, which will become more efficacious because of advances in reason and the social order, are bound eventually to put an end to hereditary and contagious illnesses and to general ill-health arising from climate, food and working conditions. It wouldn't be hard to show that this hope should apply to almost every other illness whose remote causes we come to discover. Would it be absurd now to suppose that *this* improvement is capable of indefinite progress; to suppose that the time must come when death will be due only to extraordinary accidents or to the decay (slower and slower ·down through the generations·) of the person's vital forces, and that eventually the amount of time between a person's birth and this decay will have no assignable value? Certainly man won't become immortal; but can't the interval between a man's birth and ·his death—i.e.· the usual time at which naturally, without illness or accident, he encounters the difficulty of staying in existence—become ever longer?

Since I am now speaking of a progress that can be precisely represented by numbers or on a graph, this is the place where I should explain the two meanings that the word 'indefinite' can have.

This average life-span that we are supposing to keep lengthening as men push on into the future could be growing in either of two ways:

- (i) following a law such that the life-span continually *approaches* some indeterminate length without being able to *reach* it—like the series $n - \frac{1}{2}, n - \frac{1}{3}, n - \frac{1}{4}, \dots$;
- (ii) following a law such that as the centuries unroll the life-span becomes longer than any determinate quantity that might have been assigned as its limit—like the series 1, 2, 3, 4,

In case (ii) its increases are really *indefinite* in the strictest sense of the word, since there is no length x such that the life-span must be shorter than x . In case (i) the increases are also indefinite in the sense of being *indefinite to us*, because we can't say what the length n is that the life-span can go on approaching but can never reach. The fact is that even if we know that the increases can never stop, we don't know whether they are indefinite in sense (i) or in sense (ii). And this is the end-point of our present knowledge of the perfectibility of the human species—the sense in which we can call human perfectibility *indefinite*.

Thus, in the example we are considering, we have to believe that average human life-span will increase for ever unless physical upheavals prevent this; but we don't know what the length is that it can't ever exceed; we don't even know whether the laws of nature have set any such limit.

But that doesn't end the *questions* about human perfectibility. Mightn't it be that individual improvements in the strength, dexterity and acuteness of our **senses** can be transmitted from one generation to the next? Observation of the various breeds of domestic animals should incline us to think so, and we can confirm this by direct observation of the human species.

Lastly, can we hope for the same thing for our **intellectual** and **moral** faculties? Mightn't it be that our parents, who transmit to us the benefits or defects of their bodily constitution, and from whom we receive our distinctive facial features as well as our tendency to certain physical upsets, also transmit to us that part of the physical organisation that determines intelligence, brain-power, energy of soul, or moral sensibility? Isn't it likely that education, by improving these qualities, also influences, modifies and improves this physical organisation? . . .

These questions that bring to an end my examination of this last era. And this picture of the human species—•freed from all its shackles, •no longer dominated by chance or by the enemies of its advances, and •striding with a firm and sure step along the path of truth, virtue and happiness—how consoling it is for the philosopher who laments the errors, the crimes and the injustices which still pollute the earth and of which he is often a victim! Contemplating this picture is the reward for all his efforts on behalf of reason's advances and of the defence of liberty. He ventures to regard these efforts as links in the eternal chain of human destiny; and *that* is the true repayment for virtue, namely the pleasure of having done lasting good that fate can't destroy through any fatal operation that brings back prejudice and slavery. This contemplation is for him a refuge into which the memory of his persecutors cannot pursue him. In there he unites himself in thought with man re-established in his rights and in the dignity of his nature; he forgets those who are tormented and corrupted by greed, fear or envy; he truly lives there with people like him, in an elysium [see Glossary] which his reason has created for him and which his love for humanity enhances with the purest joys.

THE END