

The Impact of Science on Society (Analysis & Summary)

Note for myself:

The below summary and its pages correspond with the page numbers in the PDF version of the book linked below under "Sources". It differs from my physical copy, which is 5 pages behind this PDF copy. In short: ignore the green highlights because those are for me.

CHAPTER I: SCIENCE AND TRADITION

Chapter I focuses solely on science as a philosophy. Later chapters cover science as technique.

[Pgs. 1-4] [Pgs 6 - 9 IN PHYSICAL BOOK]

- The human species is relatively new
 - We're at the beginning of **transforming** human life
- The effects of science are of various different kinds:
 - 1) **Direct Intellectual Effects:** The dispelling of many traditional beliefs
 - a) The adoption of *new beliefs* based on the success of the *scientific method* (this, in my view, will ultimately result in science as a powerful dogma or religion eventually)
 - 2) **Effects on Technique in Industry and War**
 - a) As a result of *new techniques*, profound changes in social organization, and then gradually, political changes occur (see: Brzinski, transitory phases brought on through technology, fragmentation, etc)
 - b) Finally, as a *consequence* of our *new found capability to exert control over our environment* (via advancements in *scientific technique*), a ***new philosophy emerges, and alters Man's conception of reality and his place within it***
 - i) ******This new philosophy may, if left unchecked, inspire a form of un wisdom and could possibly be disastrous for society.***
- "Anthropology has made us vividly aware of the mass of unfounded beliefs that influence the lives of uncivilized human beings." (e.g how ancient man equated things like illness to sorcery, or natural disasters to divine anger, so on)
- Russell mentions Human Sacrifice as one of those "unfounded beliefs/practices" in this segment; he also provides historical examples, and the dates the various cultures ceased their murderous practices
 - Human Sacrifice was thought to promote victory in war, and the fertility of the soil (superstition)
 - "The life of the savage is hemmed in by taboos, and **the consequences of infringing a taboo is frightful.**"
 - Evidence of Human Sacrifice goes back to the Old Testament (Abraham & Isaac, for example)
 - "But by the time Jews became fully historical, they had abandoned the practice [Human Sacrifice]."

- The Greeks abandoned the practice around the 7th century BC
- The Carthaginians *still* practiced Human Sacrifice during the Punic Wars
—> (And possibly also while their society was flourishing? Check the sources in [Mouthy's Moloch vid](#))

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- The era of Charles II is when the scientific rejection of traditional superstitions became common among educated men
 - Charles II believed that Science could be “an ally against the ‘fanatics’, as those who regretted Cromwell were called”
 - *“He founded the Royal Society, and **made science fashionable**. Enlightenment spread gradually downwards from the Court. The House of Commons was as yet by no means as modern in outlook as the King.”*
- It was around this time that the belief in Witchcraft began to be viewed as superstition
- Shakespeare’s MacBeth was government propaganda
 - *“No doubt the witches in that play made it more acceptable as a piece of flattery of the monarch”*

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- The laws against Witchcraft gradually fell into abeyance, and were repealed in 1736
- ***“The victory of humanity and common sense in this matter was almost entirely due to the spread of the scientific outlook - not to any definite argument, but to the impossibility of the whole way of thinking that had been natural before the age of rationalism that began in the time of Charles II”***
 - Russell says this was partly a **revolt against moral code that was too rigid**
- Scientific Medicine also had to combat superstitions similar to those that inspired Witchcraft at first, too
 - *“Insanity, in particular, was thought to be due to possession by evil spirits, and was therefore treated by subjecting the insane to cruelties which it was hoped the demons would dislike. George III, when mad, was still treated on this principle”*

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- Through the work of the great men in the 17th century, **a new outlook on the world was developed.**
 - This outlook, rather than a singular definite argument, is what brought about the decay of the belief in superstitions (witchcraft, etc)
- Russell says there are *three ingredients in the scientific outlook of the 18th century that were specially important:*

- 1) Statements of **fact should be based on observation**, not on unsupported authority (*Observation versus Authority*)
- 2) The inanimate world is a self-acting, self-perpetuating system, in which all changes conform to **natural laws** (*The autonomy of the physical world*)
- 3) **The earth is not the center of the universe**, and probably Man is not its purpose (if any); moreover, "purpose" is a concept which is scientifically useless. (*The dethronement of "purpose"*)
 - a) These "ingredients" make up what is called the "**mechanistic outlook**"; it led to the cessation of persecution and to a generally humane attitude

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• Russell builds on those three ingredients that make up the mechanistic outlook:

- **(1) Observation versus Authority:**

- The concept of deriving truth or fact from observation is a modern conception, and was not at all the norm up until recently.
- Modern educated people understand that observation is the most accurate way to derive truth and understand the world, as opposed to consulting with ancient authorities/prophets/etc
- Due to the absence of this concept in the minds of men that lived at this time, the very way they thought about the world and sought to understand it was radically different
 - For example, "*Aristotle maintained that women have fewer teeth than men; although he was twice married, it never occurred to him to verify this statement by examining his wives' mouths.*"
- The conquest of the East by Alexander caused an immense influx of superstition into the Hellenistic world.
 - This was most notable in regards to Astrology, which most later Pagans believed in
 - "*At the time of the Renaissance, belief in astrology became a mark of the free thinker: it must be true, he thought, because the Church condemned it*"

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- "Free-thinkers" weren't yet any more scientific than their ideological opponents at this point, though - especially when it came to observable facts
- Many people believe in something because they feel that it *must* be true; in these cases, an immense weight of evidence is required to dispel the false belief
 - For example: "*When Galileo's telescope revealed Jupiter's moons, the orthodox refused to look through it, because they knew there could not be such bodies, and therefore the telescope must be deceptive.*"

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• (2) The autonomy of the physical world:

- *“Perhaps the most powerful solvent of the pre-scientific outlook has been the first law of motion, which the world owes to Galileo...”*
- The first law of motion says that a body which is moving will go on moving in the same direction with the same velocity until something stops it
 - Before Galileo, it was believed that a lifeless body will *not* move by itself, and if it is in motion, it will gradually come to rest. For example: Aristotle believed that the heavenly bodies were pushed by Gods
 - The advent of the **law of motion** completely upended the way Man perceives the world around him

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• (3) The dethronement of “purpose”: *“Aristotle maintained that causes are of four kinds; modern science admits only one of the four...the two that do concern us are the ‘efficient’ and the ‘final’ cause. The ‘efficient’ cause is what we should call simply ‘the cause’; the ‘final’ cause is the purpose.”*

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• More on the “efficient cause” and the “final cause” of Aristotle:

- *“Suppose you find a restaurant rant at the top of a mountain. **The ‘efficient’ cause** is the carrying up of the materials and the arranging of them in the pattern of a house. **The ‘final’ cause** is to satisfy the hunger and thirst of tourists. In human affairs, the question ‘why?’ is more naturally answered, as a rule, by assigning the final cause than by setting out the efficient cause.”*
 - *“This ambiguity in the word “why” led Aristotle to his distinction of efficient and final causes.”*
 - *“Or, to revert to the question about cancer, a man of science may believe, in his private capacity, that cancer is sent as a punishment for our sins, but qua man of science he must ignore this point of view. We know of ‘purpose’ in human affairs, and we may suppose that there are cosmic purposes, but in science it is the past that determines the future, not the future the past. ‘Final’ causes, therefore, do not occur in the scientific account of the world.”*

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• Charles Darwin, the adaptations of Animals, “survival of the fittest”, Evolution

- What Galileo and Newton did for astronomy, Darwin did for biology
- The adaptation of animals to their environment was a trending theme among naturalists in the 18th and early 19th centuries; these adaptations were explained by the Divine purpose
 - *“it was difficult, before Darwin, to explain the adaptation of living things to their environment otherwise than by means of the Creator’s purposes.”*

• It was the Darwinian mechanism of “survival of the fittest” that made it possible to explain adaptation **without bringing in “purpose”**, not the fact of Evolution

- *“Random variation and natural selection use only efficient causes. This is why many men who accept the general fact of evolution do not accept Darwin's view as to how it comes about”*

- For example: one can believe in Darwinian Evolution, but also believe it was a God that created the laws that adaptation and Evolution follows

• **(4) Man’s place in the universe:** There are *two opposite kinds of effects* that science has had on Man’s understanding of their place in the universe

- It has degraded and exalted him
 - It degraded Man from the standpoint of contemplation, and exalted him from that of action

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• The modern universe (which came about with the victory of the Copernican system) established that the Earth is not the center of the universe

- This once again was a major upending of Man’s perception of life, and our understanding of our place and purpose within the universe

• From pages 13-14, Russell explains mathematically how large the universe is, and how small and insignificant Man is compared to it

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The understanding that, not only are we *not* the center of the universe, but that the universe is infinite, empty, and all celestial bodies around us are moving *away* from us (Red Shift), it essentially **destroys the contemplative aspect of man’s place in a scientific cosmos**

• To the practical Man, they can understand why an Astronomer might be interested in the contents of the Universe and its vastness, but to them, what matters most is what they make of their finite life

- *“Scientific Man can make vastly more of the world than unscientific Man could”*

• *“In the pre-scientific world, power was God’s”*

- Man could not do much to change the environmental circumstances he was born into
- Earthquakes, famine, pandemic, defeats in war...these were all chalked up to “Divine Anger” (God, superstition).
- Because pre-scientific Man could not *change* the circumstances around these tragedies, it was all attributed to angry Gods.

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In the Scientific World, all of this is different.

• *“It is not by prayer and humility that you cause things to go as you wish, but by acquiring a knowledge of natural laws.”*

- The power you acquire from gaining knowledge via natural laws, according to Russell, is much greater and much more reliable than that that is supposedly acquired by prayer
 - The power of prayer has recognized limits

“It is true that if we ever did stop to think about the cosmos we might find it uncomfortable. The sun may grow cold or blow up; the earth may lose its atmosphere and become uninhabitable.

Life is a brief, small, and transitory phenomenon in an obscure corner, not at all the sort of thing that one would make a fuss about if one were not personally concerned. But it is monkish and futile—so scientific man will say—to dwell on such cold and impractical thoughts. Let us get on with the job of fertilizing the desert, melting Arctic ice, and killing each other with perpetually improving technique. Some of our activities will do good, some harm, but all alike will show our power. And so, in this godless universe, we shall become gods.”

- Thus, Darwinism had had many effects on Man’s outlook on life and the world (and their place within it).

- Russell notes that the dividing line between Men and Apes is awkward; **when did Men get souls?** Was the Missing Link capable of Sin?

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Darwinism, especially when misinterpreted, threatened not only theological orthodoxy, but also the creed of 18th century liberalism.

- Russell goes on to speak on equality among Man: *“The admission that men are not all equal in congenital endowment becomes dangerous when some group is singled out as superior or inferior. If you say that the rich are abler than the poor, or men than women, or white men than black men, or Germans than men of any other nation, you proclaim a doctrine which has no support in Darwinism, and which is almost certain to lead to either slavery or war.”*

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I thought the following quote was pretty thought provoking: *“It would be odd if the last effect of science were to revive a philosophy dating from 500 B.C”*

- Science has immensely increased the sense of human power
 - This effect is more closely associated with developments in **scientific technique** than **science as a philosophy.**

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CHAPTER II

*“Science, ever since the time of the Arabism has had **two functions:**”*

- (1) To enable us to *know* things, and
 - The Greeks (with the exception of Archimedes) were only interested in this function
 - They had a lot of curiosity about the world, but because they lived comfortably on slave labor, they had no interest in *technique*
- (2) To enable us to *do* things
 - Interest in the practical use of Science came first through superstition and magic

For example: *“The Arabs wished to discover the philosopher's stone, the elixir of life, and how to transmute base metals into gold. In pursuing investigations having these purposes, they discovered many facts in chemistry...”*

- The late Middle Ages brought about **two discoveries** that were profoundly important:
 - (1) The invention of **gunpowder**
 - The purpose of gunpowder, at first, was that it enabled central government to control the population, and subdue rebellious citizens and barons
 - ***“The modern power of the State began in the late 15th century and began as a result of gunpowder. From that day to this, the authority of States has increased, and throughout it has been mainly improvement in weapons of war that has made the increase possible.”***
 - (2) The invention of the **Mariner's Compass**
 - The Mariner's Compass was equally important as Gunpowder.
 - The New World was opened to white colonists because of it; and it opened up the route to the East and enabled us to embark upon it around the Cape of Good Hope and go on to conquer India
 - It also brought about important contacts between Europe and China
 - As a result of the Mariner's Compass, the importance of sea power was enormously increased; it was through sea power that Western Europe came to dominate the world

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- Nothing nearly as important as Gunpowder and the Mariner's Compass was developed in the way of scientific technique until **the age of steam and the Industrial Revolution**
 - ***There is nothing new in the thought that scientific technique may take things too far (see: the Atom bomb)
 - Russell provides an example with the Industrial Revolution; he states that the Industrial Revolution caused *“unspeakable misery both in England and in America”*
 - He also states that the **average level of happiness** in England in the early 19th century (post Industrial Revolution) was likely *lower* than it had been a century earlier

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- Russell builds on the concept of the Industrial Revolution resulting in misery by focusing on the cotton industry
 - Cotton was the most important example of early industrialization
 - But it involved child labor and dangerous machines that involved horrific accidents resulting in death
 - Handicraftsmen no longer had work due to the advent of Machines
 - Rural laborers were forced to migrate to towns/cities by the Enclosure Acts (which used Parliament to make landowners richer by making peasants destitute)

- ***Russell mentions that **agent provocateurs** were employed by the government to try and squash revolutionary sentiments among the workers who were then deported or hanged***
 - *“Such was the first effect of machinery in England. Meanwhile the effects in the United States had been equally disastrous.”*
 - The slave trade that flourished as a result of the cotton industry
 - The outcome of the above was the Civil War, which Russell states would not have happened if the cotton industry had remained unscientific
- Once again he states that the **evils due to a new scientific technique are not a new thing**

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- Steam was one of the most important elements of the Industrial Revolution
 - Its most distinctive sphere of operation was in transport - railways and steamers
 - The large-scale effects of steam transportation did not develop fully until after the middle of the 19th century when it led to the opening of the Middle West of America and the use of its grain to feed the industrial populations of England and New England
 - This led to increased prosperity
 - It made possible a very rapid increase in population in every civilized country
- The next important stage in the development of Scientific Technique has to do with **Electricity, Oil, and the Internal Combustion Engine**
 - Electricity was first used in the **Telegraph**, long before it was used as a source of power
 - This had 2 *important consequences*:
 - *** (1) **Messages could now travel faster than human beings** (abolition of distance as H.G Wells called it in his book “The Open Conspiracy”)
 - *** (2) In large organizations, detailed **control from a center** became much more possible than it had been before (centralization of power)
 - One of the most important consequences of the telegraph was the **increase in central control**
 - > *“In ancient empires satraps or proconsuls in distant provinces could rebel, and had time to entrench themselves before the central government knew of their disaffection.”*

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- The Telegraph caused transformation anywhere organizations covering large areas were concerned
 - *The effect of the telegraph was to increase the power of the central government and diminish the initiative of distant subordinates. This applied not only to the State, but to every geographically extensive organization.:*
 - *“We shall find that a great deal of **scientific technique has a similar effect.**”*
 - *“The result is that **fewer men have executive power, but those few have more power than such men had formerly.**”*

- Electricity as a source of power is more recent than the Telegraph, and the consequences of that type of use has not yet fully revealed themselves
 - *** *“As an influence on social organization its most notable feature is the importance of **power stations, which inevitably promote centralization.**”*
 - *“The philosophers of Laputa could reduce a rebellious dependency to submission by interposing their floating island between the rebels and the sun. **Something very analogous can be done by those who control power stations, as soon as a community has become dependent upon them for lighting and heating and cooking.**”*
- The importance of Oil and the internal-combustion engine is obvious
 - It is advantageous for oil companies to be very large being as they otherwise cannot afford things like pipelines
 - Politically, Oil is also of supreme importance (and a source of friction in international relations)
- The development of **Aviation** is extremely important, too
 - Airplanes have immeasurably increased the power of governments
 - *“No rebellion can hope to succeed unless it is favored by a portion of the air force”* (NOTE: is this still the case in the digital era we presently reside in?)
 - *“Not only has air warfare increased the power of governments, but it has increased the disproportion between great and small Powers. Only great Powers can afford a large air force, and no small Power can stand out against a great Power which has secure air supremacy.”*
- The most recent technical application of physical knowledge (at the time Russell was writing this book): **Atomic Energy**
 - *“Perhaps it will become a source of power for certain purposes, thus carrying further the concentration at present represented by power stations. Perhaps it will be used as the Soviet Government says it intends to use it—to alter physical geography by abolishing mountains and turning deserts into lakes. But as far as can be judged at present, atomic energy is not likely to be as important in peace as in war.”*

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- In the past, War has been the chief source of social cohesion
 - Since science began, it has been the strongest incentive to technical progress
 - *“In any given state of technique there is a limit to size. The Roman Empire was stopped by German forests and African deserts; the British conquests in India were halted by the Himalayas; Napoleon was defeated by the Russian winter. And before the telegraph large empires tended to break up because they could not be effectively controlled from a center.”*
 - Thus, **Communications** has historically been the chief factor limiting the size of empires
- **“There would now be no technical difficulty about a single world-wide Empire.** Since war is likely to become more destructive of human life than it has been in recent centuries,

unification under a single government is probably necessary unless we are to acquiesce in either a return to barbarism or the extinction of the human race.” ****

• “There is, it must be confessed, a psychological difficulty about a **single world government**. The chief source of social cohesion in the past, I repeat, has been war: the passions that inspire a feeling of unity are hate and fear. **These depend upon the existence of an enemy, actual or potential. It seems to follow that a world government could only be kept in being by force, not by the spontaneous loyalty that now inspires a nation at war”**

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- Covered so far has only been the techniques derived from physics and chemistry
 - “...but **biology, physiology, and psychology** are likely in the long run to affect human life quite as much as physics and chemistry.”
- **Food and Population**
 - At the time this book was written, the population of the world was increasing at 20 million a year. It is now much more, and considered exponential
 - The population of Western Europe and the United States remains stationary (NOTE: more recently in places like Japan and the US, this may no longer be the case - birthrates and testosterone is plummeting)
 - According to Russell: “This is an explosive situation. **Left to itself, it must lead to a food shortage and thence to a world war.** Technique, however, makes other issues possible.”
 - The most vital statistics in the West are dominated by **Medicine and Birth Control**
 - One diminishes deaths, the other diminishes births
 - The result: the average age in the West increases, there is a smaller percentage of young people and a larger percentage of old people
- Developments in agriculture may allow us to temporarily avert a world food shortage
 - However, if world population continues to explode, those agricultural improvements (likely achieved with technology), will not suffice for long
 - There will then be **two groups**:
 - (1) The poor with an increasing population, and
 - (2) The rich with a stationary population
 - Russell believes a situation like this can only lead to eventual world war
 - “If there is not to be an endless succession of wars, **population will have to become stationary throughout the world, and this will probably have to be done, in many countries, as a result of governmental measures”**
- There are 2 other possibilities outside the above scenarios though:
 - (1) War becomes so destructive that there is no longer a danger of overpopulation, or
 - (2) The scientific nations may be defeated, and anarchy may destroy scientific technique

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Biology, heredity, Genetics, gene modification of plants & animals, and eventually humans

• *“Biology is likely to affect human life through the study of heredity. Without science, men have changed domestic animals and food plants enormously in advantageous ways. It may be assumed that they will change them much more, and much more quickly, by bringing the science of genetics to bear. Perhaps, even, **it may become possible artificially to induce desirable mutations in genes.***

- *In any case, **it is pretty certain that scientific technique will very soon effect great improvements in the animals and plants that are useful to man.***

• *“**When such methods of modifying the congenital character of animals and plants have been pursued long enough (to be successful), it is probable that there will be a powerful movement for applying scientific methods to human propagation.** There would at first be strong religious and emotional obstacles to the adoption of such a policy.”*

• Russell then goes on to give an example of such a powerful movement to achieve the above via scientific means:

“But suppose (say) Russia were able to overcome these obstacles and to breed a race stronger, more intelligent, and more resistant to disease than any race of men that has hitherto existed, and suppose the other nations perceived that unless they followed suit they would be defeated in war, then either the other nations would voluntarily forgo their prejudices, or, after defeat, they would be compelled to forgo them. Any scientific technique, however beastly, is bound to spread if it is useful in war.”

- In other words, if some other country - especially one considered an opponent or enemy - develops cutting edge technology that allows for the modification of Man (which would be useful in war), this existential threat to our existence would be the significant push to achieve these ends (we *must* modify ourselves if we are to defeat the enemy and survive)
- This process will continue until Mankind decides he has had enough of wars and wants to live in peace
 - Because this future does not seem to be coming anytime soon, the **“scientific breeding of human beings must be expected to come about.”**

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The scientific development of Mass Psychology

Physiology and Psychology are two fields that are waiting to be developed by scientific technique

• Pavlov and Freud have laid the foundation for this development.

- Russell states that the structure that is built from this development has yet to be seen, **“...but the subject which will be of most importance politically will be Mass Psychology”** (NOTE: He is SPOT ON here in my opinion)

• “[Mass Psychology], of course, as a science, founded upon individual psychology, but hitherto it has employed rule-of-thumb methods which were based upon a kind of intuitive common sense. **Its importance has been enormously increased by the growth of modern methods of propaganda.** Of these the most influential is what is called “education.” Religion plays a part, though a diminishing one; **the press, the cinema, and the radio play an increasing part.**”

- Essential to mass psychology is the art of persuasion
 - Historically, our mistake has been to believe that Man is a rational animal, and we framed our arguments on this hypothesis
 - **“We now know that limelight and a brass band do more to persuade than can be done by the most elegant train of syllogisms.”**
 - It may be hoped that in time **anybody will be able to persuade anybody of anything if he can catch the patient young and is provided by the State with money and equipment.”**

• Russell states that the subject of **Mass Psychology will make great strides when it is taken up by scientists under a scientific dictatorship**

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The future of psychology, psychological manipulation, its use in scientific dictatorships, the indoctrination of the youth, the ability to prompt the disregard of objective truth

“The **social psychologists of the future will have a number of classes of school children on whom they will try different methods of producing an unshakable conviction that snow is black.**”

- “Various results will soon be arrived at. **First, that the influence of home is obstructive. Second, that not much can be done unless indoctrination begins before the age of ten. Third, that verses set to music and repeatedly intoned are very effective. Fourth, that the opinion that snow is white must be held to show a morbid taste for eccentricity.”**

• Russell believes that the science of Mass Psychology will be rigidly confined to the governing class

- The populace will not be allowed to know how its convictions were generated
- **“When the technique has been perfected, every government that has been in charge of education for a generation will be able to control its subjects securely without the need of armies or policemen.”**

• “The social effects of scientific technique have already been many and important, and are likely to be even more note-worthy in the future. **Some of these effects depend upon the political and economic character of the country concerned; others are inevitable, whatever this character may be.**”

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“The most obvious and inescapable effect of scientific technique is that it makes society more organic, in the sense of increasing the interdependence of its various parts.”

- In the sector of Production, this has two forms:
 - (1) The intimate interconnection of people engaged in a common enterprise (such as in a single factory), and
 - (2) The relationships between one enterprise with another
 - Each of these becomes more important with every advance in scientific technique
- In industry, the integration that scientific technique brings about is much greater and more intimate
 - The most obvious result of industrialism is that a much larger percentage of the population lives in towns and cities than in the past
 - *“The town dweller is a more social being than the agriculturist, and is **much more influenced by discussion.**”*
 - The city-dweller works in a crowd, and his interests and hobbies are likely to take him into still larger crowds - what matters most to him is the environment he resides in and his place within various organizations
 - Take for example a man who works in a factory: the number of organizations he is bound to and that affect his life is numerous
 - The factory he works in, any larger organization of which the factory is a part of, the man's trade union or political party, his housing likely comes from some governmental housing authority, his children go to school...the entertainment he consumes (newspapers, media, etc) are developed by powerful organizations
 - Indirectly, this man is dependent on the organizations that provide the raw material that permits him to nourish himself and his family
 - Above it all, the state taxes him and may at any moment radically alter his life via legislation

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The increase of organization (resulting from advancements in scientific technique) has brought into existence new positions of power

- Every entity has executive officials whom power is concentrated within

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“The increased power of officials is an inevitable result of the greater degree of organization that scientific technique brings about.”

- “To discover ways of controlling it [the power of officials] is one of the most important political problems of our time”

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“Unless the power of officials can be kept within bounds, socialism will mean little more than the substitution of one set of masters for another: all the former power of the capitalist will be in-herited by the official”

- One drawback to the power of officials is that they tend to be distant/remote from the things they control
 - What do men in the Education Office know about education? Only what they dimly remember from their time in public school
- Due to the increase of organization as a result of advancements in scientific technique, the question of liberty and its limits need completely different treatments from that of 19th century writers like Mill
 - Single acts of man are typically unimportant
 - The acts of groups are more important than they used to be, however
 - If a single Man refuses to work, that is his own affair
 - If there is a strike in a vital industry, the whole community suffers
 - The same goes for war: when two men dual, it is trivial. When 200 million people go to war, it has global implications
- *“With every increase of organization, war becomes more serious”*

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“The right to make war, like the right to strike, but to a far higher degree, is very dangerous in a world governed by scientific technique. Neither can be simply abolished, since that would open the road to tyranny. But in each case it must be recognized that groups cannot, in the name of freedom, justly claim the right to inflict great injuries upon others.”

- Russell goes on to promote the idea of eliminating individual sovereignty of countries:
 - ***“Means must be found of subjecting the relations of nations to the rule of law, so that a single nation will no longer be, as at present, the judge in its own cause. If this is not done, the world will quickly return to barbarism. In that case, scientific technique will disappear along with science, and men will be able to go on being quarrelsome because their quarrels will no longer do much harm. It is, however, just possible that mankind may prefer to survive and prosper rather than to perish in misery, and, if so, national liberty will have to be effectively restrained.”***
- He believes that *“the question of freedom needs a completely fresh examination”*
 - The idea that “freedom” needs to essentially be redefined is exactly what Julian Huxley, first director of the UN’s UNESCO, believed in as well
 - Russell believes there are forms of freedom that are desirable and that are gravely threatened,
 - And that there are other forms of freedom that are undesirable and very difficult to curb
- *“There are two dangers, both rapidly in- creasing. Within any given organization, the power of*

officials, or of what may be called the "government," tends to become excessive, and to subject individuals to various forms of tyranny. On the other hand, conflicts between different organizations become more and more harmful as organizations acquire more power over their members. Tyranny within and conflict without are each other's counterpart. Both spring from the same source: the lust for power."

• The resultant twofold problem, of preserving liberty internally and diminishing it externally, is one that the world must solve, and solve soon, if scientific societies are to survive."

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Two types of organizations: those that aim to get something done, and those that seek to prevent something from getting done

- The post office is an example of the first kind, the fire brigade is an example of the second kind
 - *"And so it comes about that, whenever an organization has a combatant purpose, its members are reluctant to criticize their officials, and tend to acquiesce in usurpations and arbitrary exercises of power which, but for the war mentality, they would bitterly resent. It is the war mentality that gives officials and governments their opportunity. It is therefore only natural that officials and governments are prone to foster a war mentality."*

[Pg. 41 - 42] (Pgs. 36 - 37 IN PHYSICAL BOOK)

The gains and benefits of scientific technique

- Prosperity: the average inhabitant of the US is much richer than 18th century inhabitants - this is due almost entirely to advancements in scientific technique
- A variety of other benefits such as: sufficient food, education, medical attention, safety, easier travel, less and less slums, etc

CHAPTER III: SCIENTIFIC TECHNIQUE IN AN OLIGARCHY

[Pg. 43] (Pg. 38 IN PHYSICAL BOOK)

Russell defines "Oligarchy" as follows: *"Any system in which ultimate power is confined to a section of the community: the rich to the exclusion of the poor, Protestants to the exclusion of Catholics, aristocrats to the exclusion of plebeians, white men to the exclusion of colored men, males to the exclusion of females, or members of one political party to the exclusion of the rest."*

- Historically, oligarchies were usually based upon birth, wealth, or race
 - A new kind of oligarchy was introduced by the Puritans during the English Civil War.
 - *"They called it the "Rule of the Saints." It consisted essentially of confining the possession of arms to the adherents of one political creed, who were thus enabled to control the government in spite of being a minority without any traditional claim to power."*

[Pg. 44 - 46] (Pgs. 39 - 41 IN PHYSICAL BOOK)

- Scientific technique increases the importance of organizations, and therefore the extent to which authority impinges upon the life of the individual.
 - Therefore, it follows that a **scientific oligarchy** has more power than any other oligarchy preceding it

Centralization of organizations:

“There is a tendency, which is inevitable...for organizations to coalesce, and so to increase in size, until, ultimately, almost all become merged in the State. A scientific oligarchy...is bound to become what is called ‘totalitarian’...all important forms of power will become a monopoly of the State.”

- *“For some reason which I have failed to understand, many people like the system when it is Russian but disliked the very same system when it was German. I am compelled to think that this is due to the power of labels; these people like whatever is labeled “Left” without examining whether the label has any justification.”*
- Oligarchies have always been more interested in their own advantage rather than that of the rest of the community
 - *“Many progressives were taken in by an argument for a new kind of oligarchy. ‘We the progressives are wise and good; we know what reforms the world needs; if we have power, we shall create a **paradise**.’ And so, narcissistically hypnotized by contemplation of their own wisdom and goodness, **they proceeded to create a new tyranny, more drastic than any previously known...**”*
- *“...since the new oligarchs are the adherents of a certain creed, and base their claim to exclusive power upon the Tightness of this creed, **their system depends essentially upon dogma: whoever questions the governmental dogma questions the moral authority of the government, and is therefore a rebel.**”*
 - *“There are sure to be other creeds, held with equal conviction, which would seize the government if they could. Such rival creeds must be suppressed by force, since the principle of majority rule has been abandoned.”*
 - *“It follows that there cannot be freedom of the press, freedom of discussion, or freedom of book publication. There must be an organ of government whose duty it is to pronounce as to what is orthodox, and to punish heresy.”*
- The completeness of the resulting **control of opinion depends in various ways on scientific technique**
 - *“Where all children go to school, and all schools are controlled by the government, the authorities can close the minds of the young to everything contrary to official orthodoxy. Printing is impossible without paper, and all paper belongs to the State. Broadcasting and the cinema are equally public monopolies. The only remaining possibility of unauthorized propaganda is by secret whispers from one individual to another. But this, in turn, is rendered appallingly dangerous by improvements in the art of spying.”*

[Pgs. 47 - 48] (Pgs. 42 - 43 IN PHYSICAL BOOK)

In the next few pages, Russel describes various economic systems and forced labor

- Forced labor systems will always be preferable to the authorities/state/government

[Pg. 49] (Pg. 44 IN PHYSICAL BOOK)

The type of oppressive system of governance seen in Soviet Russia will exist “wherever there is a scientific government which is securely established and is not dependant on popular support”

- (A technocratic socialist world state variant is inevitable?)
- Technology and advancements in Scientific Technique has made it so the government or the state can be far more oppressive than any government could be *before* there was scientific technique
 - Propaganda makes persuasion easier for the state
 - The effectiveness of modern armaments makes revolt impossible
 - (NOTE: Has technology advanced to such a degree that conquest is possible without using “armaments” in the conventional sense, as Russell is here? Silent Weapons, Quiet Wars? Soft Weapons? Enslavement through pleasure?)
- Scientific societies are in their infancy

[Pg. 50] (Pg. 45 IN PHYSICAL BOOK)***

Advances in physiology and psychology will give governments much more control over individual mentality than they now have even in totalitarian countries

- Russell speaks on Fichte (Fik•tuh), and how he believed that education **should be aimed at destroying free will** so that students will be incapable of thinking or acting otherwise than as their schoolmasters would have wished for the rest of their lives
 - (Education is a conditioning system that doesn't truly *educate*, but rather propagandizes the student to prep for socialization in the real world)
- **** **“In future such failures are not likely to occur where there is dictatorship. Diet, injections, and injunctions will combine, from a very early age, to produce the sort of character and the sort of beliefs that the authorities consider desirable”**
 - **“Any serious criticism of the powers that be will become psychologically impossible. Even if all are miserable, all will believe themselves happy, because the government will tell them that they are so.”** (SEE: Slavery without tears once again - huxley's final revolution idea)
 - **“A totalitarian government with a scientific bent might do things that to us would seem horrifying. The Nazis were more scientific than the present rulers of Russia, and were said—I do not know with what truth—to use prisoners in concentration camps as material for all kinds of experiments...”**
 - **“If they [the Nazis] had survived, they would probably have soon taken to scientific breeding.”**
 - **“Any nation which adopts this practice will, within a generation, secure great military advantages.**
 - **“The [scientific breeding] system...will be something like this:**
 - **All but 55 of males and 30% of females will be sterilized (except, maybe, in Elite aristocratic circles)”**

- “The 30% of females will be expected to spend the years from eighteen to forty in reproduction, in order to secure adequate cannon fodder.”
- “As a rule, **artificial insemination will be preferred to the natural method.**”

[Pg. 51] (Pg. 46 IN PHYSICAL BOOK)

- If they desire the pleasures of love, they will usually seek it out with sterilized partners

Eugenics/Scientific Breeding

“Sires will be chosen for various qualities, some for muscle, others for brains. All will have to be healthy, and unless they are to be the fathers of oligarchs they will have to be of a submissive and docile disposition.

- “Children will...be taken from their mothers and reared by professional nurses.
- **“Gradually, by selective breeding, the congenital differences between rulers and ruled will increase until they become almost different species.**
- **A revolt of the plebs would become unthinkable**

The Family Unit; Degenerate Violence

- “The family as we know it would seem as queer as the tribal and totem organization of Australian aborigines seems to us.
 - Deprived of the pleasures by the abolition of the family, the upper class will adopt the mentality of **ascetics**: they would care *only* for power; they would not hesitate to be cruel to obtain it
 - Through this practice of cruelty, men would become hardened, so that worse and worse tortures and degeneracy is required to give them a thrill
- Russell says that, although all of that sounds like an impossible nightmare, he believes that the Nazis would have established such a system if they had ended up winning World War II

[Pg. 52] (Pg. 47 IN PHYSICAL BOOK)

To prevent these scientific horrors, **Democracy is required, but not sufficient**

- SEE: Snowden stating that technology is outpacing democratic ideal
- SEE: General trend of power to gravitate toward technology and away from government (from previous video reviewing the history of technocracy)
 - In his 1982 Technology and Culture journal article, "The Technocratic Image and the Theory of Technocracy", [John G. Gunnell presciently writes](#): "...politics is increasingly subject to the influence of technological change"
 - "Political power tends to gravitate towards technological elites" - Gunnell

“The "Rights of Man" must be subject to the supreme consideration of the general welfare.”

- *“However, there are injuries which it is hardly ever in the general interest to inflict on innocent individuals. The doctrine is important because the holders of power, especially in an oligarchy, will be much too prone, on each occasion, to think that this is one of those cases in which the doctrine should be ignored.”*

[Pg. 53] (Pg 48 IN PHYSICAL BOOK)

Russell starts discussing Totalitarianism, and how it has a theory as well as a practice.

• He defines Totalitarianism as: *“As a practice, it means that a certain group, having by one means or another seized the apparatus of power, especially armaments and police, proceed to exploit their advantageous position to the utmost, by regulating everything in the way that gives them the maximum of control over others”*

- He says that Totalitarianism as a *theory* is different, though:
 - *“It is the doctrine that the State, or the nation, or the community is capable of a good different from that of individuals and not consisting of anything that individuals think or feel”*
 - People like *Hegel* advocated for this doctrine; Hegel glorified the State
 - *Hegel* also thought that a community should be as organic as possible. In an organic community, he thought, **excellence would reside in the whole. An individual is an organism, and we do not think that his separate parts have separate goods**
 - In an organic society, good and evil would be part of the larger whole rather than the parts. **This is the theoretical form of totalitarianism**

[Pg. 54] (Pg. 49 IN PHYSICAL BOOK)

Russell thinks on whether or not a scientific dictatorship could be stable, or be more stable than a Democracy.

- Russell sees no reason that this would not be the case, aside from dangers like war
 - We have a history of using huge numbers of slaves (and still do in various ways), so there is nothing in human nature that makes this system impossible
 - The whole development of scientific technique has made it easier to maintain a despotic rule over a minority, too.
- *** **“I do not see how any internal movement of revolt can ever bring freedom to the oppressed in a modern scientific dictatorship.”**
 - When the State controls the food supply, its power is absolute (see: concept of full spectrum dominance/total war)
- He then goes on to compare the strengths and weaknesses of two countries at war, one being a scientific dictatorship and the other being a Democracy:

- Russell believes that the country that allows liberty (or is a democracy) would most certainly become superior in war techniques in a short period of time. (because freedom in scientific research is incompatible with dictatorships)

[Pg. 55] (Pg. 50 IN PHYSICAL BOOK)

*** *“For these various reasons, I do not believe that dictatorship is a lasting form of scientific society - **unless (but this proviso is important) it can become world-wide**”*

CHAPTER 4: DEMOCRACY AND SCIENTIFIC TECHNIQUE

- Russell opens up the chapter by saying that the word “democracy” has become ambiguous

[Pg. 57] (Pg. 52 IN PHYSICAL BOOK)

- Russell once again lists a term that needs to be redefined, just like “Freedom”
 - *“I am inclined to think that ‘Liberty’, as the word was understood in the 18th and 19th centuries, **is no longer quite the right concept**”*
 - (Once again, very similar to Julian Huxley’s statements in “UNESCO: It’s Purpose and Its Philosophy”, and how “freedom” needs to be redefined when creating a new world)

[Pg. 58 - 60] (Pgs. 53 - 55 IN PHYSICAL BOOK)

There is a tendency embodied in communist systems where, although anti-democratic, is in line with technical developments of modern industry

- This tendency is to attach importance not to heroes or common men, **but to organizations**
- In this view: individual people are parts of a larger whole; components of a larger working system
 - **“Each such body - so it is said - represents some social force, and it is only as part of such a force that an individual is of importance”**
- So, we have 3 different points of view that lead to 3 different political philosophies:
 - 1) You may view the individual as a **common man**,
 - 2) As a **hero**, or
 - 3) As a **cog in the machine**
 - a) View #1 leads you to old-fashioned democracy
 - b) View #2 leads you to fascism
 - c) View #3 leads you to communism
 - i) Everyone is all of the above depending on the situation; a celebrity becomes a common Man where taxes are concerned, a common man may become a hero after saving someone from drowning, and you are a cog in the machine when you go off to work in an organized group

(1) "What science has done is to increase the proportion of your life in which you are a cog"

ii) Russell believes that, in a good social system, Man will be each one of those at once

(1) Man should have the opportunity of initiative; the common man should have security; As a cog, Man should be useful to his society

• The **Cog** theory is mechanically possible, but it is **humanly the most devastating of the three**

- A cog should be *useful*, but *useful* for what?
 - You can only justify the **cog theory** through **worship of the machines**

Expanding further on **Man as a cog**:

"[In order to justify Cog Theory], You must make the machine an end in itself, not a means to what it produces. **Human beings then become like slaves of the lamp in The Arabian Nights.** It no longer matters what the machine produces....In time **men will come to pray to the machine**"

- Russell says that this will not do, and that this is not a preferable outcome
- "The idolatry of the machine is an abomination" (Pg. 60)(Pg. 55 in physical book)
- **** "**The Machine as an object of adoration is the modern form of Satan**, and its worship is the modern diabolism."

- Russell doesn't believe in abolishing machines despite that, though

• Returning to the subject of Democracy now:

- Russell's main point: "**Scientific technique, by making society more organic, increases the extent to which an individual is a cog; if this is not to be an evil, ways must be found of preventing him from being a mere cog**"
 - To prevent this evil outcome, initiative must be preserved in spite of organization
 - However, most of that initiative will likely be "political" in that the initiative will consist of advice given to organizations to achieve some political end
 - Because of this circumstance, organizations *must be governed democratically*
 - Not only governed democratically, though; Russell says that it should go so far as "every energetic person can hope to influence the government of some social group of which he is a member" (democratic process)

[Pgs. 61 - 70] (Pgs. 56 - 65 IN PHYSICAL BOOK)

• Although democracy promotes freedom and liberty, it is now beginning to result in a sense of powerlessness among the common man due to the sheer size of its constituency

- If you are a senator or a congressman, you have considerable influence. The odds are about 100,000 to 1 that you are neither

- If you are an ordinary citizen, all you can do is vote...and because there has never been an instance where a single person's lack of vote altered an elections results, you feel powerless and as if you live in a dictatorship
 - Things would be better, Russell believes, if more people took part in local politics (NOTE: Brzinski also stated that, in order to preserve democracy while transitioning into the Technetronic era, more involvement in local politics would be required)
- Russell then spends some time laying out what a system that maximizes individual initiative would look like, and what would be required to achieve it
- He envisions a world of "to each according to their needs" when it comes to liberty and equality
 - Russell entertains the principle of Scientists being given opportunities that are in proportion to their abilities, not to their scientific orthodoxy
- On **Utopias**:
 - *"The construction of Utopias used to be despised as the foolish refuge of those who could not face the real world. **But in our time social change has been so rapid, and so largely inspired by Utopian aspirations, that it is more necessary than it used to be to consider the wisdom or un-wisdom of dominant aspirations.**"*
 - In other words, whether the creation of Utopias *is actually* a foolish refuge for the weak or not, the fact that much of our technologically-driven societal changes are fueled by innovators seeking to construct a Utopia, and we therefore *must* pay attention to the subject
 - Marx was a utopian himself, though he made fun of utopians. The same with Lenin.
- Lenin was the leader who got the closest to establishing a working system resembling Plato's Philosopher King - (what is Plato's Philosopher King?)
 - Plato's Philosopher King is the idea that the best form of government is one that is ruled by philosophers
 - In Plato's *Republic*, the lead character *Socrates* proposes the design of an ideal city as a model for how to order and organize the individual soul
 - Plato's hypothetical system/city would require specialized military "guards" that are divided into 2 groups: the *Rulers* who would be the "guards" in the sense of guardians (wholly dedicated to the good of the city rather than individual pursuits), and soldiers who would be their "*auxiliaries*"
 - Plato stresses that the guards *MUST* be virtuous and selfless, as well as living *communally* as soldiers do in their camps
 - He even believed that **wives and children should be in common**
 - The "Guards" should include *qualified* men and women, and will be known as "*Philosopher Kings*" and "*Philosopher Queens*"
 - This ruling group should mate and reproduce on the city's orders, raising their children communally and considering all guardians as parents, **rather than attaching yourself to that of a private family household**

- The children will be tested through life, and if they are regarded as virtuous and skilled enough - qualified for the role - they will become the rulers
 - Therefore, “*Philosopher Kings*” will be based on merit rather than status at birth
 - Lastly, Plato believed that the “*Philosopher Kings*” must *actually* be philosophers
- Now that you know what Plato’s ideal system of governance would be, this is what Russell had to say about Lenin coming close to achieving that vision:

*“Lenin had the almost unique privilege of actually constructing his Utopia in a great and powerful State; he was the nearest approach known to history to Plato’s philosopher king. The fact that the result is unsatisfactory is, I think, mainly due to intellectual errors on the part of Marx and Lenin....Western democrats are constantly accused...of having no inspiring and coherent doctrine with which to confront communism. I think this challenge can be met. I will therefore repeat, in a less argumentative form, **the conception of a good society by which I believe that democratic socialism should be guided.**”*

- In other words, Russell believes that a system of democratic socialism is ideal, so long as its components are constructed and organized in a way that follows our 3 *requisites* that serve as general directives:

1) Man should be useful

- a) Russell’s idea of Man being “useful” is that of him providing a service for his community
 - i) A poet may believe he is “useful” by writing his verses, but if the larger community doesn’t agree, the poet should find some other way to be “useful” to his community

2) Man needs security

- a) Unemployment, illness, and old age do not deserve punishment, and should not be allowed to bring suffering that is otherwise unavoidable
- b) Society has a duty to support all those willing to work, whether they are able to work or not
- c) A man must not be subject to arbitrary arrest or to confiscation of his property without judicial or legislative sanction

3) Opportunity for initiative

- a) The most difficult directive to achieve - usefulness and security form the theoretical case for socialism, but without opportunity for initiative, a socialistic community might have little merit
 - i) Russell tells us to read Plato’s *Republic* or More’s *Utopia* - both being socialist works - and to imagine living in one of those societies...he said the boredom of living in that society would drive us to suicide or rebellion

• *“A democratic scientific society, by exacting service and conferring security, forbids or prevents much personal initiative which is possible in a less well-regulated world.”*

- Russell finishes the chapter by stating the following:

*“So long as the old Liberal freedoms survive, you can engage in propaganda for whatever excites you. Such activities suffice to satisfy most men's combative instincts. Creative impulses which are not combative, such as those of the artist and the writer, cannot be satisfied in this way, and for them the only solution, in a socialist State, is liberty to employ your leisure as you like. This is the only solution, because such activities are sometimes extremely valuable, but the community has no way of judging, in a given case, whether the artist's or writer's work is worthless or shows immortal genius. Such activities, therefore, **must not be systematized or controlled**. Some part of life—perhaps the most important part—must be left to the spontaneous action of individual impulse, **for where all is system there will be mental and spiritual death.**”*

CHAPTER V: SCIENCE AND WAR

[Pgs. 71-75] [Pgs. 66 - 70 IN PHYSICAL BOOK]

- The chapter begins with Russell asserting that the connection between Science and War has gradually grown more and more intimate
- Science has played a decisive role in war since the age of Archimedes
 - Artillery destroyed the feudal system,
 - Greek fire kept the Byzantine Empire in existence for centuries,
 - The greatest men of the Renaissance commended themselves to the powerful by their skill in scientific warfare
 - When Leonardo wanted a job from the Duke of Milan, he wrote the Duke a long letter about his *improvements in the art of fortification*,
 - When Galileo wanted employment under the Grand Duke of Tuscany, it was his calculations and projections of cannon balls that he relied on.
 - During the French Revolution, men of science didn't have their heads cut off because of their contributions to the war effort
 - Russell lists only one instance that serves as an exception to the above: During the Crimean War, Faraday was asked about using Poison gas...Faraday said it was entirely possible to do so, but chose not to on the grounds of humanity. (Unfortunately for us, those days were long ago)
- *“Modern warfare, so far, has not been more destructive of life than the warfare of less scientific ages, for the increased deadliness of weapons has been offset by the improvement in medicine and hygiene.”*

- Russell states that, up until the present, Science has not yet made war more destructive (NOTE: Russell reflects on the potential for far dangerous warfare made possible by Science later in the book)
- There are other ways that the evils of war have been increased due to scientific technique though:
 - *“A modern nation at war is more organized, more disciplined, and more completely concentrated on the effort to secure victory, than was possible in pre-industrial times; the consequence is that defeat is more serious, more disorganizing, more demoralizing to the general population, than in the days of Napoleon.”*
 - Still though, *“Some wars in the past were quite as disorganizing and as destructive of the civilization of devastated areas as was the Second World War.”*
- He then brings up how the Atomic Bomb as an example of how scientific technique has changed warfare and made it more deadly, changing society in its wake:
 - **The atom bomb, and still more the hydrogen bomb, have caused new fears, involving new doubts as to the effects of science on human life.** Some eminent authorities, including Einstein, have pointed out that **there is a danger of the extinction of all life on this planet.** I do not myself think that this will happen in the next war, but I think it may well happen in the next but one, **if that is allowed to occur.** If this expectation is correct, we have to choose, within the next fifty years or so, between two alternatives. Either we must allow the human race to exterminate itself, or **we must forgo certain liberties which are very dear to us**, more especially the liberty to kill foreigners whenever we feel so disposed.”
 - Cynically, Russell believes that it is probably that ***Mankind will choose its own extermination as the preferable alternative*** and that we are likely ***living in the last age of Man***
- If Man decides instead to go on living and not drive itself to into extinction, Russell says that ***drastic changes to the way we think, feel, and behave as a society will have to be made***
 - ***“We must learn to submit to law, even when imposed by aliens whom we hate and despise, and whom we believe to be blind to all considerations of righteousness.”***

[Pgs. 76 - 80] [Pgs. 71 - 75 IN PHYSICAL BOOK]

Russell lays out what must be done in order to ensure the survival of our species:

“But if human life is to continue in spite of science, mankind will have to learn a discipline of the passions which, in the past, has not been necessary. Men will have to submit to the law, even when they think the law unjust and iniquitous. Nations which are persuaded that they are only demanding the barest justice will have to acquiesce when this demand is denied them by the neutral authority. I do not say that this is easy; I do not prophesy that it will happen; I say only that if it does not happen the human race will perish, and will perish as a result of science.”

- According to Russell, a clear choice must be made within the next 50 years: the choice between *Reason and Death*
 - *** “And by ‘Reason’, I mean

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