Social and Psychological Challenges of the 21ˢᵗ Century and Beyond

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Abstract—**Shakespeare's metaphor "*What is past is prologue*" is used to trace past changes of the previous century that caused the social and psychological challenges of today. Those changes included inventions that made war more devastating and challenged us to live through technological inventions that completely changed our society. Next, challenges of the present, in the form of changes taking place that are creating personal and social difficulties are similarly examined. These include terrorism, overpopulation, global warming, new diseases, and a war that could destroy Earth's entire population. Some of these may be precursors to challenges of the 21ˢᵗ Century. Based on these, some forecasts are made regarding a more distant future challenge that could completely alter our view of the world and the universe. Finally, some suggestions are made regarding how to prepare for the social and psychological challenges that we can expect in the future.**

Index Terms—**Future challenges, historical change, present challenges, psychological isolation, social isolation, SETI.**

I. INTRODUCTION

I begin with a quote from William Shakespeare, namely, "*What is past is prologue*," because it very appropriately represents the approach I take in this essay. The phrase is from Shakespeare's play *The Tempest* (Act 2, Scene 1) in which the character Antonio tells his friend Sebastian that all that has happened to them in the past has led them to do what they must do now.

Applying this to a social and psychological perspective, Shakespeare's metaphor emphasizes that certain events which occurred in previous times have brought about our present situation, and that the current circumstances are laying the foundation for what is likely to happen in the future. The phrase tells us that we must be mentally and psychologically prepared for difficult events that may occur in the future.

Furthermore, some of the topics that I discuss and that I will predict might seem shocking to some people. But please try to keep an open mind on these matters because many of the technological and social changes that happened in the past have also shocked many people.

First, I wish to emphasize that my approach is scientific, namely, a social science approach. Science is the process of logical reasoning and doing careful research about our environment, our world, and everything in it, including ourselves and other people. Therefore, psychology must be scientific in order for us to understand and deal with the

changes that are occurring and that will occur in our world, and in society in the future.

II. PAST CHANGES THAT ALTERED OUR LIVES

A. Automobiles

The whole of human history is too long to cover all changes that have affected our lives, so I will limit my review to changes in the last century, starting with the automobile. There were no cars before 1886, so people walked or used horses. But in that year, the first car, the Benz-Motorwagen, was built by German inventor Karl Benz. In the early 1900s, cars began to appear on our dirt roads, and in 1908, Henry Ford's Model-T started to be mass-produced. Initially, people thought automobiles were a passing "fad." But soon towns and cities all over the world changed, with major roadways, traffic jams, and accidents causing injury and death to average citizens. The United Nations' World Health Organization reported that 1,240,000 people were killed in automobile accidents in only one year [1]! This invention has changed us psychologically because many people identify with cars as an extension of their psyche, and it changed society because we now use cars for social outings and to visit distant friends.

B. War

War in the 20ᵗʰ Century shocked everyone because of the technological changes that made those wars so devastating, and because of the social and economic changes that resulted. Previously, most people thought of war as some distant conflict that had no effect on them, but that changed in the 20th Century. As these events are precursors of today and of the shocking changes that are yet to come, let me have some time to summarize them.

The 20ᵗʰ Century was truly a critical turning point in human history. Many things that were only dreamed about in the past became realities in the 20ᵗʰ Century. Regretfully, many of the most profound discoveries have been associated with the economic and social devastation of war.

In World War I, ideas that were once only fantasies of creative writers were transformed into realities. For example, in 1903, H.G. Wells wrote a story, "The Land Ironclads" [2], which were large iron boxes that were placed on wheels to protect the soldiers riding inside from being shot by the enemy. The military built such iron boxes for real use in World War I in the form of what we now call "tanks" [3]!

C. Airplanes

The dream of flying has been with us since pre-history, but it was not until the 20ᵗʰ Century (1903) that mechanical flight

was first achieved. Airplanes were also used in 1914 in World War I, and used very effectively. They fired machine guns and dropped bombs not just on soldiers and military buildings, but also on civilians, killing men, women, and children in their homes. As a result of the machinery invented to wage war in World War I in the four years of 1914-1918, over 17 million people were killed, plus another 20 million were wounded, including both soldiers and civilians all over the world [4].

Airplanes were also the weapon that brought the United States into World War II, i.e., the bombing of Pearl Harbor. And airplanes were the weapon that dropped atomic bombs on Hiroshima and Nagasaki, where only two bombs killed as many as 200,000 people [5]! In both cities, even though the main targets were military facilities, most of the dead were civilians. People were instantly incinerated, while others died from burns, radiation, and other injuries, including illness and malnutrition. As a result of all the technological changes and their new application to warfare, the total number of military and civilian deaths in World War II has been estimated to be more than 60 million [6]. Therefore, the change in type of aircraft controlled by nations resulted in immense changes required in the way we think about life on Earth!

The foregoing was only about motor driven airplanes. But the military soon realized that faster planes give great advantages in warfare, so they began to develop faster engines. Although work began on jet engines in the 1920s, two jets were invented in the 1930s [7], and in the 1940s, jet aircraft were further developed and used in World War II and the Korean War.

Of course, changes can have positive as well as negative effects. Commercial companies started using jet engines, and in 1958 the Boeing 707 entered commercial service, allowing people to travel distances at speeds that would have been impossible just ten years earlier. This made it possible for anyone to travel to many distant countries and see many different kinds of people and cultures. Consequently, the invention of the turbojet engine greatly transformed the way we see the world.

In World War II, rocket technology also changed. Rockets were used by Nazi Germany to bomb London, but after that war, the USA and the USSR developed rockets for several purposes. One was to secretly advance military capabilities, which led to the "Cold War," which was a political war, not an actual war. But another, more profound change in rocketry was to extend human exploration into outer space!

D. *Space Exploration and Computers*

John Kennedy, President of the USA in the early 1960s, went beyond Cold War thinking. He fought in World War II, but saw another purpose for the technological advancements of his time. On 12 September 1962, in a surprising, bold, and shocking speech, he announced that the United States planned "to send a man to the Moon and return him safely to Earth."

The "Space Race" had begun! But many intellectual challenges had to be overcome before President Kennedy's goal could be met. The most significant change needed was the advancement in computer technology because humans could not make the calculations fast enough to keep up with the speeding spacecraft. Thus, two changes were required. One was to increase computer speed because the spacecraft had to fly at a speed of 18,000 miles per hour in order to maintain their orbits, and had to reach a speed of more than 25,000 miles per hour to escape the Earth's gravity in order to fly to the Moon.

The second change needed was to make the computers small because they had to be on board the spacecraft with the astronauts. But the computers that existed in the 1960s were so large that one computer was the size of an entire room of a building, but the rocket engines could not lift such heavy loads. Thus, the giant computers of that time had to be miniaturized. This is why, today, we are now able to hold calculators in our hands and carry them wherever we go!

III. CHALLENGES OF THE PRESENT

The foregoing discussion mentioned only a few examples of past changes that challenged our way of thinking and required us to adjust our psychological and social selves, and how we look at the world. These past changes have now become well established in the way we live our lives today. And, just as Shakespeare's words intended, the past has led to the challenges that we face today, and are also a "prologue" to the challenges that we will encounter in the future!

As Shakespeare mentioned, today's problems have their origins in the past, and there are many challenges that we face every day, and you already know most of them. Some of these will evolve into greater problems in the future, but whereas there are many, I will only mention the present challenges briefly in order to save time to examine the future.

A. *Continued Conventional Wars and Threat of War*

The danger of war has always been with us, and was constant during the entire 20th Century. World War I was called "the war to end all wars," but wars kept on raging. Then, in 1945, it was thought that the fear of nuclear weapons would put an end to war, but when more nations developed their own nuclear weapons the threat of complete destruction of the human race became a reality. No nuclear weapons have been used in war since 1945, but the threat still exists.

There were also small-scale wars, including Vietnam. And there are still numerous conflicts that have been waging for decades with no end in sight. These include the Korean, Kashmir, and Palestine conflicts, which are from the 20th Century, but have not been resolved. There are also civil wars, such as those in Central Africa and Yemen. These are social and psychological challenges because they make us question our own personal beliefs and principles as we wonder which side of those conflicts is right. For example, in Syria, should the existing government be defended even though it has been accused of atrocities? Or should the anti-government rebels be defended when they are being used by external extremists who intend to take over that country after they win and run it according to their own extreme radical ideology?

Another social challenge is what should be done about the refugees from such civil wars. There are many thousands of innocent, homeless civilians who tried to escape Syria, and there are hundreds of thousands of Africans who are presently immigrating illegally into many European nations

in order to escape the atrocities of war and economic devastation that is occurring in their countries. The social challenge is what to do with those thousands of displaced persons because the European countries to which they flee cannot economically handle them, so the citizens of Europe must learn how to deal socially with thousands of unemployed illegal immigrants who have become their neighbors.

B. Nuclear War

Today, because of technical advances, one nuclear bomb of 20 Megatons could kill all people in a radius of 30 km [8], which is larger than any city in the world. For example, if we take the three most populous cities in the world, in Shanghai, one nuclear weapon could kill all 24 million of its people. In Karachi, one bomb could kill all 23 million people. And in Beijing, one bomb could kill all 21 million people!

Thus, only three nuclear bombs could kill over 68 million people. Furthermore, it has been estimated that there is a total of 17,000 nuclear weapons in the world today [9]. If all those bombs were used in a war, those weapons have enough power to kill 374 billion people. And as there are 7 billion people living on the Earth, this means that the entire population of this planet could be destroyed more than 50 times!

C. Terrorism and Religious Conflict

Religious conflict has troubled us for thousands of years, the most extensive and devastating of which was the Crusades, which lasted from 1096 to 1291 AD (although there were smaller conflicts that lasted until 1588). And in those hundreds of years of religious wars, many soldiers on both sides were killed, and many civilians were murdered. The actual number of deaths is difficult to count because of incomplete records, but has been estimated to be 3,000,000 [10]. Furthermore, many civilians were massacred when the invaders destroyed entire towns, such as Palermo, Sicily, in 831 AD, where 70,000 people were killed, and the remaining 3,000 who survived were sold as slaves. [11].

In the present, there are "jihads," or holy wars. Jihads take many forms, including terrorist attacks, and are likely to continue into the future because the different religious views and cultural values of the contending factions have never been reconciled. Furthermore, the present-day conflicts are being fought with modern weapons and indiscriminant bombings, such as happened when the World Trade Center in New York City was bombed in 2002. And today such bombings continue around the world, as we have seen in Afghanistan, India, Iraq, Nigeria, Pakistan, the Philippines, Russia, Thailand, Ukraine, and many other countries [12].

D. Overpopulation

Overpopulation is a different type of challenge, but also dates into the past. In 1798, an English economist named Thomas Malthus [13] worked out the mathematics of human population growth and warned us about the impending over-population of the Earth. Most people did not understand his mathematics, so they ignored him. But Malthus was right! When he published his study in 1798 the world population consisted of only 900 million people [14]. Forty years ago, in 1975, there were 3 billion people on this planet.

Today there are over 7 billion. And the United Nations estimates the world population will be 10 billion in the year 2050, 14 billion in 2100, 21 billion in 2200, and 36 billion in the year 2300 [15]. This poses a "psychological challenge" because having children has always been, and still is, a strong desire for most people. But if the population continues to grow at its present rate, we must learn to deal with its consequences, namely, the social challenges that include pollution, starvation, widespread diseases, and plagues.

E. Pollution

Pollution will get much worse because each person adds to the amount of pollution going into the Earth's environment, which has a limited area. The World Health Organization estimates that 7 million people die every year as a result of pollution exposure, confirming that air pollution is now the world's largest single environmental health risk [16].

F. Starvation

In addition, there will be more starvation because when more humans make more houses, there is less land available for growing food. To grow enough food for each person, the Food and Agriculture Organization (FAO) of the United Nations says that 0.50 hectares (i.e., 1.20 acres) of arable land (ground able to grow food) is needed to provide enough food annually for a person to live [17].

A chart made by the FAO shows that the amount of arable land per person today (worldwide) is only about 0.20 hectares (0.48 acres), which is less than half of what is needed [18]. This explains why there are many starving people around the world today, which means that in the coming years, the threat of large-scale malnutrition and the serious health hazards and deaths that are associated with this problem can be expected to increase. And as the population grows, this situation can only get worse. This is not only an economic problem, but it is a social problem because it results in poverty, disease, crime, war, and economic instability, as well as personal pain and misery. Hence, the challenge is to become aware of this so we can educate ourselves to find ways to solve these problems!

G. Global Warming

Many people may not see global warming as a problem because it occurs only gradually, and takes decades to develop sufficiently to be noticed. It began slowly in the past, during the industrial revolution, when carbon dioxide started to increase significantly in the Earth's atmosphere, but now global warming is increasing rapidly. Global warming occurs when the atmosphere has too much carbon dioxide (CO_2), which acts as a chemical blanket that traps heat and warms the planet. Carbon accumulates when fossil fuels, such as coal, oil, and natural gas, are burned for energy, and when forests are cut down and burned to create space for more houses, apartments, and cities. And as the Earth's population is growing so rapidly, global warming is also speeding up.

Evidence of global warming is now noticeable, with larger and more frequent typhoons being the most obvious result. Typhoons occur when the surface temperature of an ocean's water reaches 27 degrees Celsius (82 degrees Fahrenheit), and the warm water makes the typhoons more intense [19]. A study published in the journal *Science* in 2005 [20] compared

the number and intensity of hurricanes for the 15-year period of 1975-1989 with the 15-year period of 1990-2004, and found that, worldwide, there was a large increase in the number of strong Category 4 and Category 5 hurricanes. The increase in the North Pacific was large, at 36%, and in the Southwest Pacific Ocean, at 120%. But the increases were even higher in other oceans.

How is global warming a challenge? This should be obvious because of the major damages that typhoons cause, particularly the destruction of homes and farms, which means that entire families are left homeless and do not have enough to eat because farms are destroyed. There are also social problems when members of our society are left in the streets without safety or shelter; and suffer psychological problems, such as trauma. And when the environment is flooded the water becomes unclean, which can cause diseases. Thus, global warming presents a challenge that we must solve.

H. Diseases

Various diseases, some old and some new, kill millions of people every year. The World Health Organization reported that in the one year of 2012 (the last year with complete data) 22 million people died from heart disease, stroke, and lung diseases [21]. Additionally, health problems that were once unknown or obscure are becoming prolific. The AIDS virus, which was unknown before the 1980s, has caused 36 million deaths since its discovery, claims more than 2 million lives per year (globally), and ranks 1st among the most deadly infectious diseases [22]. Furthermore, according to the World Health Organization, AIDS will remain a threat well into the next century because it is spreading and becoming more drug-resistant [23].

Other new and deadly viruses, such as EBOLA, have also appeared in recent years. As viruses are easily transmitted and are known to mutate rapidly into new forms, they are a definite threat to life on Earth because they reproduce quickly in warm, moist environments, and thus can be expected to flourish in conjunction with global warming. As the Earth's population is currently increasing swiftly and will continue to do so over the next century, and more people will be living in close proximity to each other, there is a real danger of the appearance of new and deadly viruses with the potential to kill millions of people in very short periods of time.

Diseases, such as plagues, are a social problem because they destroy populations. In the 14th Century, the bubonic plague (the "Black Death") changed the life and times of Europe and the world. In those days, the global population was 450 million, but at least 75 million (possibly 200 million) people died; thus, almost half of Europe died in only four years (1347-1351) [24]. Such events are social in the sense that they can destroy large segments of society. And they are psychological challenges because they require us to emotionally deal with the trauma of seeing neighbors and family members die from the diseases. Therefore, we are challenged to cure many diseases because some have the potential to devastate (or even eliminate) our entire species!

I. Loss of Personal Freedom

In the 20th Century, many new inventions became available as a consequence of instruments needed for World War II, including electronic listening devices. In 1948, George Orwell [25] wrote a prophetic novel entitled *1984* about the abuse of such devices. He foresaw a time when governments, whom he called "Big Brother," would intrude into every aspect of human life, making a frighteningly oppressed world. To imagine this, see how the Google satellites can view your face from space [26]. Using miniature cameras, computers, and remote sensing, and the fear of terrorism, governments today have all the necessary means (and new laws) to make the oppression depicted in George Orwell's book a reality.

Today, listening devices can pick up conversations from a distance of hundreds of meters, and cameras on Earth-orbiting satellites can see anything on the ground that is 10 cm long, such as reading newspaper headlines on the ground from an altitude of over a hundred miles [27]. Every day, these devices are further developed for their sensitivity; and increasingly intrusive laws are being passed to identify potential terrorists, such that the severe limits on personal freedom that Orwell predicted are already with us today, and can be expected to increase in the coming years.

The loss of freedom also represents real and severe social and psychological challenges. Orwell showed how such intrusive monitoring of every individual would restrict what a person says and does in public, and even in private. And he also stressed how such oppressive monitoring could lead to fear and psychological paranoia.

IV. CHALLENGES OF THE FUTURE AND THE UNEXPECTED

The future will also have changes and challenges. Some will be extensions of past problems, but some will be new kinds of challenges. Here I will mention a few, but will end with one that ccould impact the human population more than any other change that occurred in history.

A. Hybrid Wars

Wars will continue because there will always be different racial and ethnic groups on Earth, and they each require resources. But the future will see "hybrid wars," which are conflicts that use a combination of all forms of war. That is, some factions will use conventional armed military conflict, but use them with unconventional terrorism, bombings, and assassinations, to undermine and defeat some targeted nation. This will be a great challenge because the people who carry out such actions can make themselves "invisible." They can be individuals or small groups who appear as ordinary people and thus "blend in" with the locals in order to secretly carry out their acts of terror. These are social challenges because the enemy agents will seem to be ordinary neighbors, but will terrorize the society. And they are psychological challenges because we must deal with the dissonance of realizing that any one of our neighbors could be an enemy terrorist.

In addition to those well-known problems, there are other, less obvious challenges that we will face in the near future. These are already occurring, but are not readily visible to everyone, namely, these are the social and psychological isolation that people are starting to feel these days. And these feelings will increase in terms of the number of people who feel them and the intensity of those feelings.

B. Psychological Isolation

Psychological Isolation is the feeling of being emotionally separated, alone, mentally distant from others, and having little interest in the feelings of other people. Such people may even have a social network, but lack a significant "bond" with their associates. They may have superficial friendships, but are not able to confide in other people, and so feel lonely and unable to relate to others. They have feelings of depression, anxiety, inadequacy, and narcissistic self-centeredness. Thus, they feel frustrated because they feel blocked from forming emotional bonds, which can result in suicide [28].

Psychological isolation is happening now, and can be seen every day as people are becoming addicted to cellphones. Personal computers first became available in the 1980s, so, anyone born after 1980 thinks computers are a "natural" part of the environment. And with their many technical advances, the new "apps" can do almost anything at the press of a button, so that cellphones are indeed drawing the users' attention deeper and deeper into this handheld electronic device. Of course, the Internet has many advantages, particularly the rapid flow of information, and instantaneous communication. And so much information is already on the Internet that libraries are becoming obsolete because everyone with a "smart phone" can get the information they want without moving from where they happen to be sitting.

But there are also some unexpected *negative* effects that are starting to appear because of the Internet. Logically, one would think that instant communication would make people feel closer. But the opposite is actually happening for many people. That is, the electronic gadget that we carry around is making many people feel isolated because they are not interacting with other people as we normally should. Human beings are "social animals," which means that we are genetically inclined to want to be physically close to other people. Have you ever walked into a café or restaurant and seen both sides of a pair of dating or married couples focused only on their personal iPhones instead of communicating or interacting with their partner?

Humans are supposed to learn about themselves by interacting with other people on a personal basis. That is, we need to find out about ourselves, including how appropriate our feelings and emotions are, by having close, personal, face-to-face interactions with other people, and we need to develop friendships that enhance our self-understanding. But when people do not have adequate personal relationships, they do not gain a good understanding of themselves, and begin to doubt their self-worth. The result will be an increase in self-destructive behavior, such as, suicide.

The World Health Organization found that suicide rates for both males and females have increased by 60% worldwide, and is now a leading cause of death among people aged 15-44. Nearly 30% of all suicides worldwide occur in India and China, and mental health disorders are associated with more than 90% of all cases of suicide, i.e., suicide is more likely when people have difficulties developing their identity and feel dissociated from their social group or community. [29]

C. Social Isolation

Social Isolation is another facet of isolation, which is developing now and which will become more pronounced in the future. Psychological isolation refers to an internal feeling of personal loneliness, while social isolation occurs when a person willfully does not interact with others (apart from basic functions such as food shopping). When people become too involved with their cellphones, they fail to develop the normal social skills needed for healthy personal exchanges with other people. Social isolation is also a risk factor for suicide [30].

The critical problem with cellphones and the Internet is that other people appear to be only images on a screen, just like the actors on television and in movies. Consequently, other people do not seem to be real. You do not talk to them and they can be switched to "off" if you do not like what they say. You can ignore or erase their messages, close off their images, and "block" them out of existence with the push of a button. That is, true social interactions with other live human beings become very limited, i.e., with very few people, which creates a belief that other people's feelings and emotions are troublesome, and should be avoided.

In one research study, it was found that technology creates "psychological distance" between people who use technology for communication. This "distance" reduces our social and moral constraints that are normally used in face-to-face communication, which facilitates unethical behavior toward other people [31]. This is a serious social problem because when human values and moral behavior are destroyed, the world could become an uncivilized jungle with billions of people engaging in anti-social behavior.

D. The Unexpected — Extraterrestrial Contact

There is yet another future challenge, and I would like to address that in detail because it is shocking. As mentioned before, we sent men to the Moon and returned them to Earth. As of 6 November 2013 (the last information available), a total of 536 people have gone into space, and 12 have walked on the Moon [32]. But what is most remarkable about this in terms of being a "challenge" to the future of the human race is that many astronauts have reported seeing unidentified flying objects (UFOs) [33].

In other words, we have overcome many great scientific "challenges" to get into space, but what we discover there will present us with the greatest social and psychological challenges that the human species will ever have to face. That is, the discovery of "Extra-Terrestrial Intelligence" (ETI), namely, intelligent life on other planets! What is the scientific evidence for this?

Biologist Carl Sagan (using the Drake Equation) developed a formula for estimating the number of stars that can sustain life in a galaxy [34]. While life might assume many forms, this approach only considers carbon-based life. Also, the formula has two components that will not be used here: One is the Rate of Star Formation (R*), which is deleted because it allows for evolution over the lifetime of a galaxy, which inflates the value. The other is the Lifetime (L), or number of years, that a civilization exists, which is a positive number that could range into the thousands, and is also excluded from the present equation because of its inflationary

effect.

Thus, the formula being used to conservatively estimate the number, N, of stars around which ETI life could evolve is:

$$N = f(p) \times n_e \times f(l) \times f(i) \times f(c), \qquad (1)$$

where:

$f(p)$ = the fraction of stars that can have planets;

n_e = the average number of planets in each planetary system with environments favorable for the evolution of life;

$f(l)$ = the fraction of such favorable planets on which life can develop;

$f(i)$ = the fraction of such inhabited planets on which intelligent life arises during the lifetime of the local sun; and

$f(c)$ = the fraction of planets with intelligent life on which an advanced technological civilization arises.

The values were scientifically derived: $f(p)$ was derived from the set of all categories of main-sequence stars (O, B, A, F, G, K, M) from which only F, G, and K have characteristics to possess planets, which represent about 25% of all stars. Based on biochemical processes, Sagan [31] suggested (p. 164) that the values of n_e and $f(l)$ might be near 100%, but I will use a more conservative estimate of about 90%. Sagan also reasoned (p. 165) that $f(i)$ and $f(c)$ are each about 10%.

If we search for ETI in our Galaxy, which has at least 100 billion (10^{11}) stars, the calculation would be:

$$N = [(0.25) \times (0.90) \times (0.90) \times (0.10) \times (0.10)] \times 10^{11}$$
$$\text{Stars/Galaxy} = 2.025 \times 10^8. \qquad (2)$$

If we limit the search to only F, G, and K stars (where $f(p)$ = 1.0) and only look within a distance of 1,000 light years (which contains 10^6 such stars), the computation would be:

$$N = [(1.00) \times (0.90) \times (0.90) \times (0.10) \times (0.10)] \times 10^6 \text{ Stars} = 8.1 \: x \: 10^3. \qquad (3)$$

And limiting our search to within a closer 100 light years (with 10^3 such stars), the computation becomes:

$$N = [(1.00) \times (0.90) \times (0.90) \times (0.10) \times (0.10)] \times 10^3 \text{ Stars} = 8.10. \qquad (4)$$

Equation (2) tells us that there are more than 200 million ETI civilizations in our galaxy. Therefore, because of the extremely large number of stars, the possible existence of ETI is so great that it simply cannot be ignored. Even though we cannot travel there due to the great distances, we have to acknowledge, from Equation (4), the probability that at least eight advanced ETI civilizations may reside within hailing distance of our radio telescopes! This means that contact with extraterrestrial intelligent life forms is possible!

E. The Search for ETI

In the latter half of the 20th Century, the idea of searching for signals from ETI was published [35], but the technology took many years to develop to a point where a search became possible. At first, only by a few visionary radio astronomers who recognized the possibility of contact spent some time searching for signals sent between ETIs. But after several years, a major effort, called the Search for Extraterrestrial Intelligence (SETI), was begun with a large array of radio telescopes [36]. SETI recognized the need to involve ordinary people. One important reason for this is to popularize ETI to help the Earth's population develop a mind-set that would enable them to be prepared for the inevitable encounter when it ultimately comes.

F. Consequences of Contact

Once contact is made with ETI, there can be positive or negative consequences. Negative consequences will result if we are not prepared for the encounter. As with the 1938 radio dramatization of H.G. Wells' novel, *The War of the Worlds*, there could be rioting, looting, and murders as people who thought humans were the only intelligent creation in the universe became mentally unstable [37]. There is, of course, the possibility that a hostile race of technologically superior ETIs could come to take over the Earth and either enslave or annihilate all humans. Given the vast distances of space, however, it is unlikely that ETIs will be on a military conquest of our obscure planet. Alternatively, it is quite possible that they will be more peaceful than we are!

Positive consequences of contact with peaceful ETIs could be extremely profound. One would be the technological advances that would come from information obtained from other intelligent civilizations via radio telescopes. These would be vastly more extensive than the advances that resulted from the 1960's US space program that landed a man on the Moon. They could include such things as medical knowledge that could yield cures for various human diseases. The information could also include new knowledge in various scientific fields, ranging from astronomy, botany, and chemistry to physics and zoology, just to name a few.

Another positive consequence would be the stimulus that ETI contact would have on our Earth's economy. There are two possibilities for this. One is the actual exchange of products between Earth and the ETIs. While this is less likely (due to the great distances), it is not necessarily impossible because, if the ETIs are advanced enough, they may know how to traverse the great distances of space. The second is the exchange of information that would give new technological knowledge that would help us create new products. This would be similar to the way computer technology created millions of new jobs around the world. In either case, the new products would stimulate the Earth's global economy.

The most desirable consequence of ETI contact, however, will be the effect that the new knowledge will have on world peace. The majority of wars that have occurred in Earth's history have been about economics. Possessing resources meant wealth and power, the lack of which has motivated militants for countless millennia. Imagine a world in which economic stimuli are being continually renewed by expanding new knowledge from regular contact with ETI. Medical cures, for example, can be created at low investment costs because of new knowledge provided by ETI. This will lead to a healthier population and medical savings.

New knowledge leads to new products, which create jobs and reduces unemployment. Economic frustration, a major cause of hostility, will be reduced or eliminated. People will gain access to wealth and no longer need to fight for

economic progress. Such advantages could lead to world peace.

V.   HOW TO DEAL WITH FUTURE CHALLENGES

The changes that are taking place now and that will take place in the future have the potential to completely alter the way we live and think for the rest of the time that we live on this planet. Therefore, we must put our minds to work to find ways to deal with these various types of challenges. And it is not just a few people who need to pay attention to these things. Rather, it is everyone's concern because the changes will affect everyone, and some changes may have overwhelmingly negative results. This means it is necessary to convince other people that dealing with these changes is critically important for the human race to survive. Thus, the challenges and the ways to address them are both social and psychological.

As these are such major challenges and problems, such as war, that have troubled the world for millennia, there are no simple solutions, which means it will not be possible to solve them all here in a few paragraphs. Instead, only some suggestions will be made regarding psychological and social isolation, and preparing for the possibility of ETI contact.

A.   Preventing Psychological Isolation

Psychological isolation occurs in several ways, but is now happening because technological advances now allow us to depend on cellphones for everything that we once did with other people. As cellphones are highly entertaining and perform so many functions, people feel less need to risk exposing their emotions to others because everyone is capable of hurting us. As one consequence, many people emotionally separate themselves from others, and thereby are becoming isolated because of their electronic addiction.

Therefore, the solution needs to have two facets, namely, it must deal with the addiction and also address the emotions. There already exist numerous methods for ending addiction, such as going "cold turkey," so, which one to use will be the choice of the therapists and patients. With regard to the emotional factor, however, this needs to be addressed by parents. Parents must be educated to start early in raising their children, that is, to learn to be emotionally close with their children by providing warmth and affection. Thus, the children will learn the value of having emotional support, and would not have excessive fear of being emotionally hurt. It has also been suggested that everyone, including friends and teachers, could also help reduce psychological insecurity by being emotionally honest with each other [38].

B.   Preventing Social Isolation

The causes of the social isolation in regard to electronic addiction are similar to those of psychological isolation, but result more in a lack of desire to socially interact with others (rather than wanting to protect oneself from emotional harm). Likewise, dependency on the cellphone can lead to this social syndrome of avoiding interaction with other human beings. Therefore, whereas the cause and the effect of reduced human contact are similar, the solution could also be similar. That is, parental upbringing that includes abundant comfort, support, and opportunities for rewarding social interaction with others could help to prevent social isolation. Education can play a major role with social as well as with psychological isolation. For example, classes could be designed to help people of all ages to become aware (or be reminded) that human beings have a deep need for interpersonal intimacy and for a feeling of "belongingness" with other human beings [39].

C.   Preparing for Extraterrestrial Contact

We have three choices with regard to how we deal with ETI. The first is to keep denying the possibility of ETI and to continue our self-imposed ignorance of the topic. The second choice is agnostic, which is to acknowledge the possibility of ETI, but basically do nothing at all about it, which is equal to simply waiting to be colonized. The third choice is to cooperate internationally and peacefully in the search for ETI. This is the pioneering choice and requires courage and conviction because the endeavor must be done in the face of cynics and contentious antagonists.

Some individuals are already forming radio-telescope activities in cooperation with the SETI Institute to "listen" for ETI messages. Other people might form discussion groups with various objectives on a variety of interests, such as compiling factual information about the possible existence of ETI. Yet other groups could plan ways to distribute this information.

We would also need to develop a language or mathematical coding system that could be used to communicate with the ETIs. Other groups could brainstorm for ideas on what messages we should send to ETIs and how to send them. Such groups and organizations would engender other clubs having related or new areas of interest, with the overall objective being to psychologically prepare us for the encounter with ETI when contact is ultimately is made.

VI.   CONCLUSION

In summary, we took a brief look at history and have seen how unexpected changes that occurred in the past have drastically changed our lives and challenged us to live with them. We also looked at the present and now can see that more changes are taking place, changes that will challenge us to deal with them in order to survive them.

Many of these changes are having social and psychological impacts on our lives. And the question we must ask is how we are going to face them. Will we be intellectually ready for the future? Will we continue to ignore what is happening in the world and burry our heads in our iPhones? Will we give up on society with all its stresses and pressures and find our release in self-destructive behaviors? Will we shrink from interaction with society and other people on a person-to-person basis and instead hide in the virtual unreality of a cybernetic world?

Or will we strengthen our minds with our new knowledge and think about these new ideas so that we will be prepared to face the major changes that are already happening now, and those that will surely impose themselves on us in the future?

How will we do this? The answer is clear if we also look at how education has helped us in the past. Our history shows that our educational attainments have brought us out of the

darkness of ignorance, and cleared a path to the modern times in which we now live. Our forefathers strengthened their minds through education and enlightened themselves to address such challenges. They built an intellectual stairway that brought us to the threshold on which we are now standing.

Now, it is time that we must determine to strengthen our educational institutions and fortify ourselves, our teachers, and our professors with knowledge that will enlighten us in ways that will strengthen everyone to endure the difficulties and enable us to more confidently deal with the challenges that will face us in the future.

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