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If I Ascend the Heavens: How Will Space Travel Change Our Lives and Our Thinking?, 1957.

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"IF I ASCEND THE HEAVENS"

November 17, 1957

Rabbi Daniel Jeremy Silver

A few of us have seen the Russian satellites orbiting above our heads. More of us have heard rebroadcasts of the radio sounds which they signal back to earth. These two flying objects moving about our earth at incredible speeds signalize dramatically the dawning of a new age. It will be called the age of space flight. It will be the age in which previously earth-bound man will cast off this earth limitation and will begin to adventure into and pioneer some of the frontiers of the universe. It seems that in the history of human invention man's fancy, man's imagination, out-runs his capacity to produce. Well over three thousand years ago, Greek legend tells us of a master mechanic, Daedalus, created the first successful man flight. This very mechanic was imprisoned by the king of Crete, but the usual avenues of escape were closed to him. He resolved to try and fly over his guards and thus escape the prison house. He took the feathers of many birds and he fashioned them into a pair of birdlike wings held together by clay and by wax, and he put these wings upon his shoulders and arms and upon the shoulders and arms of his son Icarus and they began to fly, and escape this prison. And the legend tells us that Daedalus did indeed successfully escape from Crete as far as Sicily by air. Only his son failed in the flight, because he attempted to fly too high into the heavens, and the heat of the sun's rays burnt the wax which was holding the wings together and he plunged into the sea. And according to tradition, these wings which Daedalus used to escape from the prison at Crete were dedicated at the temple of Apollo in Sicily, kept there by the altar as reminder to man of this great accomplishment not to be repeated for some three thousand years. And after three thousand years of thinking, of imagining, after men like the universal genius Leonardo da Vinci had actually

sketched a workable scheme for a flying machine, man within our lifetime, at least within the lifetime of some who are here, learnt the art of flying, and now we think nothing of spanning this continent in a matter of hours.

Space flight grew in much the same way. For a century now, we have been told by the writers of science fiction about new worlds into which we can ascend. It is a century exactly since Mr. Jules Verne wrote a very beautiful and imaginative story about a rocket train to the moon. And he and Mr. H. G. Wells and their many, many co-authors in the field of science fiction made our minds familiar with the geography of other planets, with Martian men, and with some of the scientific difficulties of space travel. And we all remember, I think, with tolerant good humor that day some twenty years ago when Mr. Orson Welles produced near-panic on the eastern seaboard of our country when in a very realistic radio broadcast he described the landing upon the fields and marshes of New Jersey of some thousands of men from Mars. Most of us, as late as October third of this year consigned most of this discussion about the possibilities of space flight to the area of science fiction. It was a literary conceit. It was a product of man's imagination, and we felt it had little real possibility of being made part of the program of our daily lives. October four we awoke, and we awoke to a new age. Sputnick I was flying above our heads at eighteen thousand or near to eighteen thousand miles per hour. It took it less than ninety minutes to circumnavigate the globe. This year, which had seen us enjoy the limitations of several generations ago, which thought that it was still a matter of dare whether a man could circumnavigate the globe in forty days, this generation, this year we had to accustom ourselves to the possibility of circling the earth in a matter of minutes. We awoke in a new age, the dawning of a new century. We awoke to many new problems and concerns with which I should like to deal this morning.

What will this new age mean for man? It will mean first of all, I think, that we will have to accustom ourselves to entirely new concept of distance and of speed.

Some of us are still amazed at the possibility of boarding a flight here in Cleveland and three or four hours later arriving at our Pacific coast. We are overwhelmed by the speed of the Sputnick, close to eighteen thousand and some miles. And yet we will have to accustom ourselves to even greater speed, and and even more telescoped distances, because the scientists are telling us that in the years ahead, through means of new power propulsions, through ions and by means of photons, man will some day learn to travel at speeds close to the speed of sound, close to 186,000 miles per second. And Venue, our nearest planet, which is twenty-five millions of miles away at the nearest point between its orbit and ours, and Mars, which is thirty-five millions of miles away, will seem to be as close to us as Tokyo or London or Rome. And the nearest star, which is twenty-five trillion, two hundred billions of miles from this earth, can be reached in a matter of years, rather than of centuries. Man will begin to explore first the near reaches of this universe of ours, and then he will probe ever further into the mysterious unknown which surrounds our earth. It promises to be a great and wonderful age in which to live, for us and for our children and for our children's children. None of us can conceive of what this new age will mean for man. None of us knows about the new discoveries about the fundamental laws of the universe, those laws which govern the movement of the most gigantic of galaxies of millions of stars and the movements and genesis and decay of the most minute sub-atomic particle. Principally, this new age will bring to us in this generation new knowledge, because the satellites and the rockets and the space ships will be used first and foremost for research. We will be told a great deal about the nature of the atmosphere which surrounds our world. We will learn a great deal more than we now know about that which causes our weather to change. Long range weather forecasting will become a matter of detailed accuracy, and one can imagine the great blessing and boon that this will be to man. We will be less and less subject to the apparent whims of nature. Scientists tell us we will be able to predict years of

drought and years of excessive rain, the genesis of the tremendous tropical storms which so disturb that part of the world. We may even learn how to make the great deserts blossom and the frozen north-lands grow again with greenery. We will learn a great deal about the use of our radio and television waves, how to make it possible for them to travel unimpeded and uninterfered with through our space. We will be able to map the mineral resources of this world and to map accurately the topography of our earth. We will learn a great deal more about that mysterious force which we call radiation. Medical science especially will be interested in the effect of cosmic radiation, of all types of short wave radiation upon human tissue, and in these studies they may find cures for the diseases which still baffle the medical research person - cancer, the mysterious process of debility and senility and death, decay - all these will be searched out, and undoubtedly startling new discoveries will shower down upon us. Truly this age promises to be one of great boon and great blessing to our earth. It will be possible for us to travel out into space. It will be possible for us to search out answers to questions which still intrigue us. And probably the first question which each of us must ask and will ask is "Is there other life in this universe of ours? Is man unique? Does life exist only upon this earth, or are there other planets circling around other suns in this galaxy or in any other on which there is life such as we know? Will this life be primitive, much like the life which Columbus found upon the shores of North America when he discovered this continent, or will it be a type of life higher than man, superhuman, with a higher degree of culture and civilization than the human species has developed?" We do not now know. The most powerful telescopes which we have been able to devise will never be able to tell us, because they cannot magnify sufficiently even the closest planets to answer this question for us. We do not now know, but as we read the literatures of the physicists and the biologists and the astronomers, one is struck by the almost unanimous affirmative answer which they give to us on this question. Yes,

they do believe that life exists elsewhere in this globe. They argue from the laws of probability. They tell us that this universe and the stars of which it is composed, the great solar systems of which it is composed, came to be in rather uniform ways, following basic laws of nature. And just as it was possible for our sun to develop planets which circled around it within its gravitational field, so in our own Milky Way galaxy, where there are hundred millions of suns similar to ours, there are probably millions of planets also similar to ours, with temperature ranges, with atmospheric conditions much like that which features this earth. They tell us that there is life elsewhere in the universe. Mr. Fred Hoyle, a noted British astronomer, estimates that in the Milky Way alone, in this galaxy of which our sun is just one small star, there are probably a billion planets somewhat similar to the earth on which life can exist. And there are in this heavens of ours hundreds upon thousands of multi-million star galaxies, each with its own potential for holding life. Yes, the scientists believe that we will find life as we course out into the universe, but we will not know until we travel, research, and report.

What of our own solar system? Is there life upon any of the other planets which circle this globe? Again we do not know. Scientists tell us that the planets which are closer than Venus to the sun are too hot to sustain life, and the planets which are further than Mars from the sun are too cold to sustain life. Venus is the planet most like ours in size and in shape. Some believe that it has an atmosphere capable of sustaining life. But in one of the miracles of scientific ingenuity the atmosphere which surrounds Venus has been researched, and we know that it consists primarily of carbon dioxide, where our atmosphere, our air, consists primarily of nitrogen. So if there is life, it is life which will have to have developed different systems of breathing than those to which we are accustomed. Is there life? We do not know. We shall have to go to see. Mars, the planet immediately outward from us from the sun, seems to offer a more promising prospect.

The great telescopes of Mount Palomar have told us that Mars has two polar caps of snow, much like the poles which top and bottom this earth. They seem to see on Mars patches of red and of green enlarge and decrease, apparently with the seasons, and some scientists have said that these represent some form of simple vegetation, expanding into more northerly and southerly regions during the summer months of Mars and contracting during its colder periods. The famous canals of Mars are held by some to be watersheds, carrying the water which would be necessary to irrigate large areas and permit them to grow vegetation. Is there life? We do not know. There is the possibility of life - that is certain, but we shall have to go and we shall have to see. And the amazing thing about this new age is that soon we will have the capacity to go, and to research, to find out, because we will have developed the powerful propellants which will permit a space ship or an unmanned rocket to break out of the earth's gravitational field, and we will have solved, scientists tell us, within a matter of years, the many troubling technical scientific problems which still impede the actual sending out of such ships, because we will have to experiment successfully and solve the problems of the weightless isolation of the universe and of its intense cosmic radiation and of its unrelieved darkness. But these aeronautical engineers, these scientists and physicists tell us that these problems can and will be solved, and our generation is not one which will again close its ears to such prediction. The first trips, the first trips which these manned or unmanned rocket ships will take, will be to our own planet, to the moon. You may recall reading in the papers just last week that there was a great deal of speculation that the Soviet Union would send a rocket missile to the moon on the anniversary, on the fortieth anniversary of the Bolshevik revolution. Obviously they have it in their potential to send such a rocket ship there now. We certainly are not far behind. It will be only a matter of years, perhaps, until a ship, manned by men, is sent out to our moon and circumnavigates it and returns to us. But we know that there is no life on the moon. To go to the moon is simply a

research advantage. We want to know its mineral composition, its geography and its topography. We want to take a look at the back of the moon, which man has never seen. It will afford us another point of reference in space from which to make accurate astronomical observations. And I think ~~that~~ this research potential of the space age is the first potential which man will realize, because space flight will be used in the decades ahead and possibly in the centuries ahead primarily as the instrument of research rather than a means of transport.

We have spoken already of some of the benefits and boons which earth-bound man will gain from this research. We cannot predict others. But it is interesting to remember that the satellites were first sent into space as a research complement to the international geophysical year, as a means of studying certain predetermined problems to which the scientists now want an answer. And they will find the answer, and their answer will bring healing and blessing unto man. But it will bring also danger and tension to our society. Every new age has dawned uneasily. It is not easy to accommodate a pattern of living, economic and political routines to new invention. You will recall that when the first steam engines were introduced into the factories of England during the early days of the industrial revolution the workers organized themselves into mobs and ravaged the countryside, breaking into the factories and breaking these engines in order to, or so they thought, protect their jobs. I am reminded of the line from the Book of Proverbs, "In much wisdom is much vexation. He who increases wisdom increases also his sorrow". For truly our potential for sorrow, for human anguish, is greatly increased by this dawning age. Not only the overwhelming fear that the new rockets will carry a war-head rather than a research-head, but also the fear that this new age will bring about the end of the great democracy in which we live. Democracy will be greatly threatened by the economic and by the political ramifications of space flight. It will tend to concentrate power into the hands of the few. It

will inevitably tend to force government to underwrite research, because no single institution, no single pocket can absorb the high cost of such research. And where there is government subsidy, there is always the danger of governmental control. Scientific know-how will bring power to a few, and our society will have to learn to accommodate itself to the institutes and the pressure groups which the scientists will inevitably develop. We will have to develop a modus vivendi by which our traditional civil rights, the tradition of principles of humane living and the high standard of living which we have adopted, can be accommodated, can be developed, and can be enlarged in the new age. And I do not believe that this problem will be easily solved. We have already seen some of the pressures which impinge upon our society because of this space flight. Already our school systems are being subjected to great pressure to increase the amount of science in their curriculum and in their requirements. Already we are wrestling with the problems of making the scientist more of a status figure in our civilization so that we can attract more of our bright young men and young women into this field. Already we are creating jobs in our government which give to scientists untrained in fields of government though highly trained in their own specialties great power, great control over the future welfare of our nation. And these pressures will increase and double and redouble themselves, and we have to ask ourselves whether man can control his scientific creation, or whether we have breathed life into a Golum, into a scientific monster who will overwhelm us, and instead of bringing us blessing, bring us only hurt.

I feel, I think I know, deep down in my heart, that man has the capacity, the courage, the understanding, the wisdom to accommodate his society to the new age as he has accommadated every previous society to every previous scientific invention. But I do know this - that it will require the concentrated and copperative efforts of men of good will in every country in every walk of life. They must be determined,

they must be fixed in their purpose, they must be dedicated to the basic principles of humane rights and civil rights. Together they can create a paradise here on earth. If they do not work together, we can create a holocaust here on earth. I feel that man himself senses this power which he now has to create a good life and not to fall into the cataclysm, the caverns of defeat.

Think of man. Think that in the calendar of world history man came into this world but a minute, two minutes ago. Look at him then. He stands before you naked, toolless, homeless, fireless. He has no power save that which he has in his own two hands. He has no civilization save some instinctive ability to garner food, which permits him to survive. This is the man who tamed the wild animals that he might ride them and use their power. Who cultivated the wild grains and brought sufficient food to his families and to his clans. Who fashioned the natural ores of our world into tools of great precision and great usefulness. Who tamed his own wild passions and learned the arts of community living. This is the man who learned to use fire, who learned to use the metals, who learned to sail the seas, who created great religions to sustain him and to encourage him, who created great works of beauty to enthrall him and to ennoble him. Who fashioned the disciplines of medicine to heal him and to give succor and sustenance to his body. Who began to think about his world, to raise himself above the fears with which he was born, the limitations with which he was born, the ignorance into which he was born, and to create for himself a civilization whose breadth and whose depth can but amaze but enthrall. Often he was stopped for a moment. Tyranny and ignorance, selfishness and short-sightedness, all these stood as obstacles in his path. But somehow, in every age, in some way, new life, the new light of knowledge, the new light of learning, the new light of technique and of know-how, insight into his own situation, into the situation in which he

found himself the world, was added bit by bit to the storehouse of world knowledge. In its pursuit he crossed oceans and deserts, vast uncharted regions. He braved great peril, and now he stands before you, poet, author, healer, scientific genius. Will man who has come so far lack the courage and the ability and the willingness to sustain what he has achieved, to take a new invention as radical as was the control of fire or the development of the simple hatchet or of the steam engine or of the plane, and use these for his benefit rather than for his hurt. I think that man can and will show the courage and the willingness to sacrifice, we shall bring blessing in this new age. And as he walks down the way into the future, man of the space age will find that he does not walk alone. God, as always, walks at his side. And I think that this man of the twentieth century and of the twenty-first century will be more conscious of the sustaining power of God than was man of our century and of the last century. Because as he probes into the universe, as he sees and is awed by its overwhelming power, by its expanding infinity of distance, by the hundreds upon millions upon billions upon trillions - our language lacks the correct words of planets and of stars which inhabit it - as he understands the secret of ths power which moves it, orderly, purposefully, through time, this man can but be amazed at the power of the God who created it, who fashioned it and gave it form and purpose. He will be closer to God than perhaps we are, locked into our cities, away from the fields, away from nature, and not open again as he will be to the mysterious tremendum, the holiness, the universal power which is revealed in the heavens.

Man's mind cannot comprehend the heavens beyond. And as the space-man probes these new frontiers he will find that always beyond him there are areas yet to be researched, frontiers yet to be broached, mysteries yet to be explained, power and purpose yet to be exposed. He will live close to God, he will feel God's benign purpose and His love, and drinking from this new-found fountain of faith, faith in himself and in his God, I am confident that he can make the space age into a truly

blessed age for man. He must learn - he must learn to cast aside all philosophies of despair, all theologies which limit man's power, which speak of man as impotent, inable, unequal to the task. He must cast aside all atheistic philosophies and agnostic philosophies which do not give him the sense of cooperative power with God. He will do so. He will find again the value of the two basic principles on which our faith is based - faith in man, who is little lower than the angels though he is limited by his own humanity, and faith in God, creator and sustainer of the universe, who spoke and it was, who gave us life because it is good.

Amen.

¶ Two Russian satellites have orbited over our heads these past few weeks. Many have seen them. Many more heard broadcasts of the radio signals that they sent down to earth. Speeding at nearly 18,000 mph around our ~~globe~~ earth, these sputniks symbolize the dawning of a new age. We are entering the age of space travel. We are entering an age in which previously earth-bound man will hurtle himself vast distances into space to search out and visit the other worlds and solar systems which populate our universe.

Man has caught up with another of his fancies. Over 3,000 years ago the Greek master mechanic Daedalus dreamed of escaping ~~the~~ the prison into which he had been thrown by the King of Greece by fashioning wings of feather and thus be able to fly over the guards. Legend tells us that he succeeded admirably in fashioning successful wings for himself and for Icarus his son. He is supposed to have flown from Crete to Sicily safely — Icarus lost his life on the way because he flew too high — too near the sun — and its rays burnt the wax by which his wings were held. Through the centuries other men dreamt of flying. Around the year in which Columbus discovered America, the amazing genius of Leonardo Da Vinci sketched the blue print of a flying machine. And after 2,950 years since the Greek first told the legend of Daedalus — machine-airplanes began to fill the air.

Space travel began as did air travel as a happy ~~fiction~~ conceit. Just over 101 years ago Jules Verne described a Rocket Train to the moon. H.G. Wells and his many disciples in the literature of science fiction embroidered and enlarged the theme. Space ships, Martian men, and the geography of other planets were familiar theme of our leisure reading. We remember with talent good humor the near panic which Mr. Orson Welles precipitated when on a radio program 20 years ago he described most realistically the landing of Martian spacemen in the fields of New Jersey.

On October ~~3rd~~ of this year — for most of us — the possibility of space travel was still a pipe dream invented by the authors of science fiction. On Oct. 4th we awoke to a new world.

Sputnik I circled our earth. Space travel was not only possible but a near reality. To place Sputnik I in its orbit, Russian engineers had shown that they had controlled basic sources of power and basic principles of aerodynamics which would soon permit man to travel out in space — away from the gravitational attraction of our earth.

It seemed quaint that 100 generations ago to circumnavigate the globe in 80 days was a feat. Yet today many of us still marvel at the possibility of speeding across the continent in 4 hours. We must now assimilate the possibility of an earth satellite encircling the earth in about 1½ hours — at only some 90 minutes.

2) There is, of course, still to-day no space flight. The 2 Russian Sputniks are flying at supersonic speeds but they are contained within the restraining walls of the earth's gravitational field. Before actual space travel can be accomplished many problems will have to be solved.

New and more powerful propellants will have to be developed. Techniques must be perfected to enable the human being to carry his own environment into space; so that its weightless isolation, its intense radiation, and its unrelieved darkness does not reduce the human space traveler to helpless immobility. But aeronautical specialists tell us that it is now but a matter of time before all these experiments are accomplished — and none of us will ever again close our ears to their predictions. It may take time but undoubtedly the means will be developed to manage sufficient propulsion power to permit a spaceship to break out of the earth's gravitational ring and for the space pilot in order to travel in relative speed and comfort into space's unknown frontiers

~~3) [illegible]~~

~~[illegible]~~

3) Space travel is to be a fact. The seemingly prohibitive distance between ourselves and the other planets is to be breached. A new conception of speed must become ~~put upon~~ accepted by our ~~minds~~.. Sputnik is covering the heavens at about 18,000 MPH. ~~Certain~~ Special rockets can develop the 25,000 MPH speeds which scientists tell us would be necessary to break out into space. These speeds defy description. Yet even at such a dizzying pace ~~[illegible]~~ the nearest planet Venus lies [illegible] years away and the nearest star would require that a generation die & another be born en route before it could be reached. Our mind can hardly conceive such speeds and already our technicians are telling ~~of~~ several new methods of propulsion by means of photons or ions which can move the ~~spaceship~~ rocket through space at speeds close to that of light. In comparison 18,000 MPH will seem sluggish. Think of traveling at roughly 186,000 MPS

That Venus at its nearest point is 25 million miles from us and
Mars 35 million miles at most speaks well for no further
than Chicago light to fly by each.

What will we find when we visit the other worlds of our
universe. Is there life elsewhere in our universe? If so, is that
life cycle [illegible] or dispersion to us in child, mental ability and degree
of civilization? No one yet Knows. If man had remained earthbound,
we would never have Known. Our most powerful telescope could
never [illegible] sufficiently to answer the query. If is
surprising the almost unanimous affirmative answer which
astronomers + physicists make to The [illegible] that life does exist
elsewhere in our universe - that there are many planets with
civilizations visiting other systems or living in the sky.

The noted British astronomer Fred Hoyle estimates that in
our galaxy alone there are over 1 million planets capable of
sustaining life - to say nothing of the possibility of life in the
thousands of other galaxies the largest which contains almost
as the far reaches of the universe

3) Most of us are intrigued by the possibility of visiting the planets and traveling about our universe. We are intrigued by the possibility of life elsewhere in our universe — and if the flying saucer ~~craze~~ episode is any indication — a little frightened. ~~A trace of the [illegible] has [illegible] [illegible]~~ Perhaps those other men would be superior to our civilization and subdue us. But perhaps also they will prove no more of a match than the American Indian proved to European explorers.

Is there life elsewhere in our universe. The scientists and astronomers answer preponderantly in the affirmative — The probability is that ~~other~~ life does exist. The noted British astronomer Fred Hoyle even goes so far as to estimate that there are 1 million planets in our galaxy which are capable of sustaining life — to say nothing of the possibility of life in the ~~hundreds~~ thousand of other gigantic star galaxies that we have revealed in our universe.

Thus a ~~scientist~~ [illegible] ~~that~~ space is a relatively uniform phenomenon and the galaxies and stars which inhabited this space have developed along uniform patterns. The probability is high then that other stars have planets circling them like our sun and that some of these planets would have atmosphere and temperature relatively like ours. Since the number of known stars runs into the thousands of millions. The probability of such planets is high.

We shall not ~~know~~, however, be able to test the theory for a while. The nearest star lies 4 1/3 light years or some 25 billion ~~200 billion~~ million miles out in space. What about ~~[illegible]~~ life on the planets which like our earth circle the sun? The ~~nearest~~ nearest closer planets are apparently too hot and the farthest are apparently too cold. Speculation has centered on Venus and Mars.

Venus is ~~apparently~~ much like our earth. It is closest

to us in size and distance. We know that it is surrounded by clouds and an atmosphere. In one of the truly amazing miracles of scientific technique [illegible] that atmosphere has been studied and we know that it is mainly carbon-dioxide. Our earth's air is mainly nitrogen. It is apparently possible for life to exist in Venus's climate, but such life will have to have develop different [illegible] breathing apparatus and be able to adjust to hotter climate

Mars offers a perhaps more promising opportunity. Observation by the giant telescope of Yerkes Observatory have shown that its poles are surrounded by snow caps and its surface has revealed red and green areas which some [illegible] to be high desert plateaus and low regions of vegetation. These darker markings vary from time to time. It may be that what we are seeing is some dense vegetation responding to changes of season. [illegible] on Mars and Venus any forms of animal life. We can only [illegible] ~~[illegible]~~ that our space age may soon fly there and find out.

The road to Venus & Mars remains in the future

Our own planet the moon will be the first to be visited. There was some speculation that the Russians would fire a rocket to the moon in honor of the 40th anniversary of the Bolshevik Revolution ~~last~~ week. Certainly, both our country and the USSR possess the ability to set off such a missile shortly

Why the moon. We know there is no life there. But there is much that we want to know about its surface, its atmosphere, its mineral composition. Indeed, the age of space travel will initially be one of ~~travel for research~~ travel for transport rather than for [illegible] ~~reactors~~. ~~Instruments~~ for scientific and planning [illegible] [illegible] [illegible] [illegible] man will travel where he needs to manipulate ~~[illegible]~~ instruments.

Most of us - perhaps all of us - will remain earthbound throughout our lives. This will not mean that space travel will not affect what we do and how we will. It will - in many ways.

As an instrument of research, earth satellites and space rockets, will probe the upper reaches of our atmosphere for vital information necessary for accurate & long range weather forecasting, uninterfered television and radio broadcasting, & cartography. Platforms can be located high in our atmosphere which will capture some of the energy of the sun rays and transform it into vitally needed power. We know today that cosmic & other forms of radiation vitally affect human tissue. In all probability medical researchers will send up experiments to test the effect of intense radiation on all forms of life. Knowledge so gained may help us discover remedies for such diseases as cancer which still lie beyond our control & perhaps even tell us something about the mysterious process of growing old.

We shall learn infinitely more than we now know about our universe and about the fundamental laws which govern its operation from the gigantic galaxies to the smallest substance particle. The more we uncover, the less we will be subject to nature's apparent whims. Years of drought and years of excessive rain can be predicted and adequate preparation made. Advance warning can be had of the formation of storms and typhoons. Vast power beyond any that man now controls will be at his disposal.

All this will affect every part of our life routine. Indeed even before any of this information has been released - we can see in embryo some of the forces at work fashioning a new age. It will be an age where the basic principles of science must be broadly understood. The science content of our school curricula will certainly be increased. President Eisenhower

Our schools are already under heavy pressure to increase their science curricula and requirements. Our society is working hard to make science and mathematics more remunerative careers to more and more young men and women. Our concepts of military strategy are necessarily undergoing complete revision.

Successful exploitation of the space age will not be easy. Scientific progress is never easily accomplished. When the steam engine was introduced in England there were labor riots by workers who broke the new machinery fearing to lose their job. We have to live now with an even greater fear – the supersonic rocket with bombs in their missile heads hydrogen explosives rather than research instruments.

I am reminded of the line from the Book of Proverbs "In much wisdom is much vexation and he that increaseth knowledge increaseth also sorrow". Have no illusions about it – the space age can increase our sorrow and not only by the terrible forces [?] cataclysm of war. This new age will present a real threat to our democracy. It will tend to concentrate power in the hands of the few. It will demand much more governmental subsidization – for space research is appallingly expensive – far beyond the reaches of most non-governmental [?] schools of research. It will create a new elite whose pressures our society will have to adjust to. It will necessitate a new military strategy whose long range ramifications are beyond prediction.

I do not know how these problems will be solved
I believe they can be solved – but I insist that their solution will require tremendous displays of courage, dedication & self sacrifice by all the men and nations of our globe.

I believe they will be solved because the evidence of man's past achievement has never been so dramatically highlighted. He has climbed so far. I feel — I know — he will achieve his goal.

In the ancient calendar of creation man came on the earth but a moment ago. Perhaps [illegible] before years ago. There he stood naked, homeless, fireless, toolless. He has no powers save that of his two hands — no civilization save that primitive ~~[illegible]~~ food getting skills which permitted him to survive. Watch the man learn to live and to domesticate the wild animal, cultivate the wild grain, control the wild forest fire, shape and tool the material ones, curb his own wild impulses that he may live together with other men. In pursuit of the life giving he learns to cross empty deserts, uncharted forests, impassable jungles, and find the hungry [illegible]. He is surrounded by enemies and plagued by fears. His every achievement is payed for in blood and tears — Yet he is indomitable — he pushes on. He is slowed by ignorance, tyranny — by the selfishness of others & by shortsightedness — But he climbs on — driven by a power he does not always understand. He develops sanctifying & sustaining religion. He creates [illegible]. He looks understandingly at art and music. His [illegible] humane learning. He looks out at his world & universally at himself. ~~[illegible]~~ Increasingly [illegible] and medicine ~~[illegible]~~ unlocks his own weather — enrich his life. Each day in some way he adds more of light — of knowledge — of beauty & of power.

Perhaps man now before years ago — [illegible] [illegible]. [illegible] — civilized. Will the man now lose all that has been won with such difficulty? Will this man realize his achievements [illegible] just to achieve once again. Will [illegible] man who has ascended even the heavens not be able to control his destiny on earth.

I think he will
I am confident he will.

He need not fear himself unequal to the task. When he is frightened of the task, let him but think back on the long road behind – the road ahead will not seem so perilous.

Nor will [illegible] man be walking the way alone. God – as always – will be by his side. He will have much need of faith & trust in God – of God's encouragement & good counsel. And I believe he will feel a deep love for God & faith in him – ~~[illegible]~~ less perhaps than [illegible] even age.

Skan the heavens. To our naked eye they seem little or [illegible] by day and dark & star filled at night. At night the naked eye can see 6,000 stars under ideal conditions. The modern telescope reveals that our own galaxy contains <u>100 million stars</u> – each set in its course and following some orderly course and pattern. To the eye the stars seem but another mile or so higher than the clouds. We now know that there are stars so many billion upon billion upon billion upon billion of miles away from our earth that their light ~~[illegible]~~ more reaches our planet and that our language has ~~[illegible]~~ created no word to describe their distance. To understand the heavens is to be thrilled at its magic and orderliness – it is to stand in awe & reverence before the God who ~~[illegible]~~ created it.

השמים מספרים כבוד אל

The heavens declare the glory of God – say the ancient psalmist

An Einstein thrilled to the music and marvel of the spheres and felt its throbbing power led him to faith in God's unfailing creative power.

Space man will live [dwell] on the frontiers of an expanding infinity of universe. Only the insensate would be deaf to the [message] ~~marvel~~ of what they are witnessing. They will sense [to fullness] ~~their own~~ abilities and yet see how in the yardstick of the unending supersonic speed and telescoped distance do not begin to measure up against God's created majesty.

I pray that as man faces his new opportunity — he will drink deeply of the water of respect of his own potential and respect for God's creative power. He will need both the dear and abiding faith to meet the difficult days ahead; So armed I am confident that it will usher in an age of the richest blessing for man!
