

An Episode of Flatland

By Charles H. Hinton

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Introduction

PLACING some coins on the table one day (fig. 60), I amused myself by pushing them about, and it struck me that one might represent a planetary system of a certain sort by their means. This large one in the center represents the sun, and the others its planets journeying round it. And in this case considering the planets as inhabited worlds, confined in all their movements round their sun, to a slipping over the surface of the table, I saw that we must think of the beings that inhabit these worlds as standing out from the rims of them, not walking over the flat surface of them. Just as attraction in the case of our earth acts towards the center, and the center is inaccessible by reason of the solidity on which we stand, so the inhabitants of my coin worlds would have an attraction proceeding out in every direction along the surface of the table from the center of the coin, and "up" would be to them out from the center beyond the rim, while "down" would be towards the center inwards from the rim. And beings thus situated would be rightly described as standing on the rim (fig. 61).



FIGURE 60



FIGURE 61

And I saw that if I supposed the surface of the table to be perfectly smooth, so that there was no impediment to motion along it, then these beings would have no notion at all that there was a surface on which they slipped. Since the surface is always in contact with every moving thing, the notion of it would be absent from their consciousness. There would be no difference in respect to it. And I saw that here I had an image of a two-dimensional world, a world in which the creatures of it would think that space itself was two dimensional.

We see that the discs which form these worlds must be supported somehow, but the beings of such a universe would not ask such a question--they would think that all the space there was lay in the extension of the movements they made, and would never think of any movement away from or into the table, being always in contact with it.

But it is very hard to realize how "out" from a disk, such as one of my coins, could be felt as "up" and inward towards the center of it would be felt as "down." To ease my mind on this point I imagined myself standing on the equator of our earth, looking along it, and then a great steel blade coming down and cutting the earth right through along the equator circle, and then coming down again and cutting a slice parallel to the first. And then I imagined this slice of the earth and myself sticking against the steel blade, like the slice of a pea against a knife blade. In this way I gained the feeling of a being on a disk, with an "up and down," "away from and to" the center of the disk.

But still I had a consciousness of another direction than those of "forward and backward"--along the rim of the disk--and "up and down" away from its center and towards it. I could not help predicating myself with the sense of right and left--away from and into the steel blade. To lose this sense I must evidently change my notion of the constitution of my body. Without carrying the cutting so far as to imagine myself sliced, I imagined myself as made of very thin material, just of the width of the slice of the earth, and supposed that I myself and all the matter of the slice were of the same thickness, and stood out from the blade to exactly the same amount.

"If now," I said, "I was unconscious of this thickness, if the blade was perfectly smooth, and I and all the matter I knew slipped perfectly freely over it, I should have a two-dimensional experience. My arm in moving, or my finger in pointing, could only move in contact with the blade, and I could never point in a third dimension. I should not think of it, for all motions of all things take place along the surface of the blade."

Thus it became apparent that without making the supposition that I was a mere line or triangle, or other geometrical figure, I could imagine myself as a two-dimensional being. If my thickness were very small and I was unconscious of it, if I could never move away from contact with a surface, my experience would be that of a two-dimensional being. So, after all, it seemed possible that there could be real two-dimensional beings. Now, if a thing is real, the only reason for not seeing it is either that it is small, or very far away--or some other reason. Hence I began to set about to try to discover these two-dimensional beings, and learn all about them. I succeeded at last, and if I do not tell you how, I am afraid it is from no very worthy motive. For if I told how one could find out about them, I am afraid Mr. Wells or Mr. Gelett Burgess or some other brilliant author would begin to write about them, and to serve them up with all the resources of wit and humor. In that case no one would listen to me. As it is I intend to have the pleasure of telling about them myself.

One thing always puzzled me from the beginning of the time when I began to think about these plane beings, and that is about their eyes.

It is clear that they could not have two eyes beside one another as we have, for there is not the thickness in their bodies to place them so. Now, if they had two eyes, I wondered if one was above the other, or if they had one eye in front, another in the back of their heads. About this and other questions, I gained subsequently all the information one can desire. I have come to think of these creatures, from what I have found out, as very like ourselves, in different physical conditions it is true--but motives, aims and character, vary but little, however conditions differ. The only broad characteristic of difference I would draw, is that they are not so massive as we. They are more easily moved to action, and political and other changes are brought to pass more easily than with us. They also take narrower views than we do, they do not look on things in the broad and tolerant way we do.

In order to place before the reader all that I have to say systematically, I will begin with a short history of Astria, summarising the events which took place on that planet from the earliest times till I come to the epoch about which I have written in more detail. With regard to that period, by selecting from the materials at my disposal, I have given some definite and personal information about characters who played an important part in late events.

The History of Astria

Astria is a plane world, along the rim of which its inhabitants walk. "Up" is away from the center of the disk, "down" is towards the center. To save myself the trouble of going into anatomical details, I will represent an Astrian, diagrammatically, by means of a triangle. And it will be conducive to the clearness of the reader's imagination, if he will suppose the great sheet of matter against the surface of which Astria, its sun, and all the material bodies of that universe slip, to be disposed vertically. He will then gain a more real presentment of the feelings of motion and progression in this world.

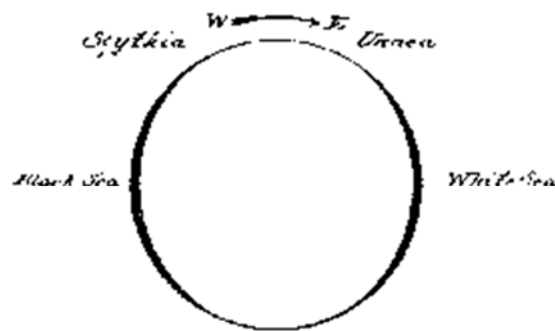


FIGURE 62

The edge of the plane world of Astria is divided into two approximately equal portions by two oceans--the Black Sea and the White Sea (fig. 62). Since the daily motion of rotation of Astria takes place in the direction denoted by an arrow, the sun appears to rise over the White Sea, and the direction from the inhabited region to the White Sea is called "east."

In the earliest times the inhabited region was divided amongst two peoples, the Unaeans and the Scythians. Of these the Unaeans were by far the more civilized. In fact, all that gave Astria the promise of becoming the gem of her planetary system, was to be found amongst the Unaeans, while the Scythians led a predatory nomadic existence. Yet, versed as they were in all the arts of life, the Unaeans, from the dawn of history, were gradually forced back and conquered by the Scythians.

Caesar in his history of the wars in Gaul, speaking of the provincials, says that it was their culture that made them fall before the barbaric and hardy valor of the Germans. He speaks as if civilization and culture brought of itself something debilitating and weakening to the sterner virtues. But a different reason must be assigned for the constant defeats of the Unaeans, the constant ravishment of their territory, the continual absorption of a region of light into darkness by the Scythian hordes, who spared neither age nor sex, and never relinquished the land they once had gained.

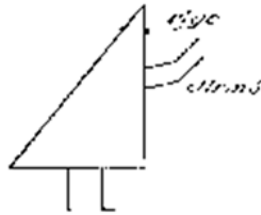


FIGURE 63

I will explain the cause of the Unaeans' ill success. My rough and ready representation of the inhabitants of Astria, by means of a triangle (fig. 63), is sufficient to enable me to describe the main features of their bodily configuration. This figure of a triangle I use in a conventional way as a mark or symbol, which is simple and easy to draw, and which without any unnecessary complication enables me to make matters plain. It shows a thing I have often wondered at, namely, that there is a certain indication in the Astrian frame of being fashioned after the pattern of a higher existence rather than of complete adaptation to the exigencies of its narrow world.

Looking at the triangle which represents an Astrian, we see that on one edge are two arms and an eye, while on the other edge there exist no organs of sense or prehension. Thus, in going to the east, an Astrian could see his way clearly, and in working on anything, if it was placed to the east of him, he could operate on it conveniently; objects to the west, however, could only be seen by his bending over, and assuming a posture which, despite the suppleness of his frame, it was difficult to assume and painful to maintain for any length of time. Objects to the west also could only be reached at in a very awkward and ineffective manner.

It seems to us as if it would be an easy thing for an Astrian to turn round so that he could face in the west direction. But to do this we would have to lift the thin body of the man away from the sheet against which it slips. Such an operation is, of course, inconceivable to the inhabitants of a plane world, and their bodies would not stand such an operation, for they are far too thin to be safely turned about and even temporarily deprived of the support of the sheet on which they slip. Every man in Astria was born facing the east, and facing the east he continued till he died.

Now I believe it is evident why the Scythians evidenced such a superiority over the Unaeans in warfare. The constitution of the Astrian body was such, that a Scythian man had an advantage over a Unaeon man of a kind that no skill or discipline could countervail.



FIGURE 64

The Scythian whom I represent as a shaded figure (fig. 64), could both see the Unaeon plainly and deliver blows at him to good effect, while the Unaeon whom I represent as an unshaded figure, could only see the Scythian by a difficult exertion, and could only attack him or strike at him indirectly and backwards.

Thus year after year the Unaeans were forced within ever narrowing boundaries, till at last, with the White Sea on one side, their irresistible foes on the other, there seemed no outcome other than final and absolute extinction.

Yet with this hopeless prospect there was no demoralization of the national character: literature and art turned to motives of a more serious nature than in times when the danger was less closely realized, and the greatest minds devoted themselves to the inculcation of a brave and stoical courage, and a religion which robbed death of its terrors.

It is easy to say in the light of after events, that the intellectual energy of the race would have been better employed in the exploration of nature, and the wresting from its secrets of more efficacious methods of warfare. But the obvious is always found by an unobvious path. Unaeans history affords no exception to the rule, as the following account of their discovery how to oppose the Scythians will show.

Amongst the men of this slowly perishing race were found some who withdrew their minds from all the fears of their time, and, with a detached and impersonal interest, studied the movements of the distant stars. Thus with the Unaeans, as with us, in Astronomy, Science was born. Science, that interest, that appreciation of things in and for their own sake which we are accustomed to think of as the product of a prosperous and leisured community, sprang up in Unaea, when the bulwarks of their national existence were crumbling before the savage insistent blows of their inveterate enemy.

And as with us, Science in Astronomy gave its first gift to man, giving us the art of navigation, so in Unaea Science through Astronomy gave its first gift to these mortals. But the gift did not consist merely in the facilitation of an art. It was of unparalleled splendor, nothing less than the salvation of their race. For, studying the mutations of the heavenly bodies, accounting for their vicissitudes, eclipses and disturbances, astronomers came to the great thought of roundness of their earth. And as the news spread, as the tidings passed from one to the other that their earth was assuredly round, without any other words a great joy filled the hearts of this intelligent people. For everyone recognized without comment, that if their world was round, then a Unaeans circumvading their disk would be in a position of as great advantage over a Scythian as the Scythians then had over them.



FIGURE 65

For we see that, on the right of the picture I give (fig. 65), we have the Scythian and Unaeans in their ordinary position of combat; but on the left we see a Unaeans who has circumvaded his globe, and comes on the Scythian in a position of advantage.

The prospect of meeting their hereditary foes under such reversed conditions, inspired the nation with the greatest ardor, and a period of astronomical discovery, equivalent to that which

lies between the labors of Ptolemy and Newton was traversed in but few years. The Unaeans surmounted the difficulties of astronomical observation which were indeed considerable.

A tube, for instance, cannot be used in Astria--there is no means by which the opposite sides can be kept together. In order to observe the transits of the heavenly bodies, it was necessary to make holes in the earth. The accompanying diagram (fig. 66) shows a Unaean telescope--a passage into the ground surmounted by a lens. It is obvious that the astronomer must descend to his place of observation by the same channel as that through which he takes his observations. If another opening were made, as shown in the second diagram, the earth above the chamber would fall into it, there being no support to keep it in its position.



FIGURE 66

To overcome such difficulties which accompanied their mining operations, as well as their astronomical observations, the Unaeans applied all the resources of their active intelligence. And before many decades had passed, after the discovery of the circularity of the earth, they had gained enough information about the phenomena of tides to predict the existence of an antipodal continent, for the rise and fall of the sea on their shore was less than that which would take place if the White and Black Seas were two limits of the same ocean.

The existence of this continent rendered an expedition to take the Scythians in the rear practicable. But, though possible, it differed in its details from any other military operation ever put into execution.

The difficulties of traversing a virgin continent were in Astria almost insuperable. In the inhabited lands all the forests had been felled and the soil was covered in summer with a springy elastic cereal, which bore its fruit in a coiled up frond. Over the resilient surface afforded by this kind of vegetation, it was possible to travel with speed and comfort. But in the primeval forest the case was different.

It is obvious that of two Astrians meeting one would be compelled to climb over the other in order to pass him. We can imagine their condition by thinking of two tightrope walkers who, since they can diverge neither to the right or left, must pass one above or below the other. They would have the notion of right and left, although they could not make use of it; but the Astrians neither had the notion, nor if they had it could they have made use of it, all their movements being limited to such as could be executed under the conditions of their material existence, that is, of not leaving the surface of the sheet against which they slipped. If merely to pass another individual afforded this measure of difficulty, it is conceivable how great an obstacle a single tree presented to progression. It had to be surmounted as it stood, or if cut down, then as it lay, with all its tangled mass of branches.

Taking the difficulties of navigation, of the penetration into the unknown continent, the emergence therefrom, and the building of ships to traverse the Black Sea, the lowest interval of time which could elapse between the departure of the expedition and the arrival of its survivors, was estimated at one hundred and fifty years. Of those that started none could reach the goal.

A part of the nation must detach itself. A band of resolute hearts, brave and bold and faithful, must be chosen for such an enterprise.

Into the incredible wastes of the forlorn antipodes must pass a chosen band. For all their lives, and for their children's children's lives, they must traverse the labyrinthine branches of a primeval forest, with nothing of all Unaea held of gracious, fair and honorable shining on them. And yet they must keep their love for her; in the hearts of unborn generations the star of patriotism must rise, keeping them faithful in the weary way, where stage by stage they bore the burden of their country's last and only hope.

The expedition started, and all Unaea bent herself with a new spirit to the task of continuing their unequal fight. They even thought of training women fighters, a thing deemed incredible before.



FIGURE 67

In speaking of the Astrians, I have previously only drawn men's figures, which are, as can be observed, all necessarily turned to the east. To represent a woman, however, it is necessary to draw a figure turned in the opposite direction, to the west (fig. 67).

Thus a Unaeian woman, if her weakness and timidity were overcome by training, would be rightly framed to resist an attack from the west. The natural responsiveness of men to women and women to men, which we notice in our world, exists in Astria to a very highly accentuated degree. There a man cannot see his friend's face, because it is necessarily turned from him, but he can watch a woman's face and note the changes of expression his words call forth. The Unaeians showed great chivalry in their treatment of women, and it was handed down as one of the most terrible horrors of that last period of their war, that actually a serious proposal had been entertained of women sacrificing womanhood, of hurling women into the contest against the Scythian oppressors.

How well the trust confided to the wanderers over land and sea was borne, is a theme Unaeian writers love to linger on. From those that plunged in the waste arose a race lithe, adventurous, daring, with but one thought, the thought of fair Unaea. At the resting places for exercise in arms, at the nightly camps, at the halting places where some beetling crag affronted them, ever and again the old story was told, of Unaea fair and distant waiting for them, and none the less beautiful and clear was the story, because their words grew few and the dialect of these wood wanderers differed strangely from the sweet cadence of the Unaeian tongue.

The sight of the crystal waters of the sea, when their hundred-year march was at an end, came to them like the fulfillment of a prophecy. They built their ships, traversed the ocean, and attacked their hereditary foes with an impact in which was concentrated, in a single impulse of destruction, all the energy, grace, thought and aspiration of their race.

Their onslaught was irresistible. When they reached the confines of their fatherland, Scythia, as a nation, had ceased to exist.

By the advent of these, her long separated children, the terrible oppression which had always weighed on Unaea was removed. All her most energetic sons had turned to war, now they turned to the arts of peace. And with the final and absolute disappearance of any power that could contest their might, a strange vicissitude of opinion took place. By the very perfection of its success the army had prepared the way for the extinction of the estimation in which it was held.

The survivors of the adventurous band, the old heroes who had held the Scythians at bay, were rewarded with gifts of land. Then Unaea settled down to think of other things than war. It fared but ill with the majority of the old-time fighters, they were ill-fitted for business, and the alluring schemes and skillful machinations of sharper men accomplished the ruin of many. That the army should have resigned itself and become a factor of no account, have passed from absolute dominion to become the merest cypher, was due to two causes. The general who had, by the force of his native capacity for command, come to the leadership of the invaders of Scythia, was a man named Wall, characterized by an absolute and simple devotion to his country. Wall's saying, "Soldier and servant," became the watchword of the soldierly men of the military class. So much for the personal cause. The other reason for the quiet disappearance of militarism was the wise provision of the capitalist class, who, foreseeing the time when the struggles with labor might become acute, established as part of the constitutional institutions of their land a standing army. The function of this army was essentially merely that of a highly-organized and very efficient gendarmerie, but by establishing a high rate of pay--for the class of work involved--and by the precaution of debarring from enlistment those who came from classes likely to be disaffected to the prevailing order of things, the governing class prepared a very real safeguard against sedition.

The wisdom shown by the founders of the modern institutions of Unaea was amply evidenced by the subsequent course of events.

After the first period of expansion was over, the versatile and enterprising genius of the people showed itself in a rapid course of organization, and the exploitation of every possible source of advantage for the organizations formed.

The working men had organizations which embraced all the skilled labor in every pursuit. The capitalists were united in organizations which controlled the supply of every kind of natural wealth. Between these two antagonistic bodies, the smaller employers disappeared. Labor and Capital were left face to face with each other, and on the side of Capital, with its traditions for private rights, government by the best, mastery and direction of the forces of the community, stood the army, a complete protection against any attempt to set aside the constitution by force.

Class distinctions came to be founded simply on wealth. The glamour of old times, when the preservation of the national existence rested on it, had completely departed from the army--save in the traditions which lived on in the army itself.

The mass of the people looked on the soldiers as mercenaries in the pay of the capitalists, while the capitalists regarded the soldiers as one amongst the various classes of men who were willing to work for them for a moderate rate of pay. Such is an epitome of Unaeian history preceding the period which I have made the subject of a special study.

[In the first few chapters we meet the star-crossed lovers, Laura Cartwright and Harold Wall. Laura's father is a powerful and unprincipled businessman who has come to control Unaea. Harold is a brave young soldier, son of the man who led the successful expedition against the Scythians. In order to prevent the marriage of Harold and Laura, Cartwright has talked Harold

into going to settle a colony overseas. Heartbroken, Laura decides to go live with her eccentric uncle, Hugh Farmer, and study science with him.]

On Lone Mountain

Shortly after the fête of flowers, Laura started to pay a long visit to her uncle in Scythia. But before recounting the events which happened at Lone Mountain, a few words as to the character and life of Hugh Farmer will not be out of place. He was the only man in Unaea who believed in the third dimension. The occurrences by which Farmer was led to form his belief form an episode which is one of the most curious that can be conceived as happening in Flatland or any region of space. In Unaea, as with us, it was quite customary to represent a number by a line, and the square of a number by a square. If the number 2 was represented by a line, then 4, the square of that number, was represented by the square on that line. It was also quite obvious to the Unaeans that the cube of 2, or 8, could be represented by a figure with one more dimension than a square. They had the formal notion of a cube. But to conceive that such a figure actually existed, contradicted every principle of their science. For science involves a basis of observation--something given by the senses on which thought acts. On the other hand, to conceive a space of three dimensions meant giving thought a wrong part to play, a wrong function to perform. Thought would not give existence, it could only operate about existing things. The Unaeans would as soon believe in chimeras or dragons as in three-dimensional space. For those notions just as three-dimensional space, were deduced from thought, not founded on evidence of the senses. Farmer shared to the full this ardor of conviction of the supremacy of sense in giving materials for thought to work on. But in his day there was a sect who held the doctrine that the soul was separate and distinct from the body. They claimed that it was possible to hold communion with the spirits of the dead, and they asserted that these ghostly beings could make themselves seen and felt. Now anything that could be seen and felt Farmer held to be a legitimate object of scientific investigation, so he took up the study of these spiritualistic phenomena. He fell a victim to jugglery. Tricks were played on him, and curious and inexplicable phenomena were produced in his presence. And it so happened, by a curious coincidence, that the marvellous occurrences which were palmed off on him were of a kind which could physically be produced if there were a third dimension. The tricks were wonderful enough in his space. But in three-dimensional space they would not be wonderful at all. For instance, in Flatland a box is a four-sided enclosure like a hollow square. Now Farmer saw objects outside such a four-sided enclosure, and afterwards inside it, without the sides being disturbed. Of course as a three-dimensional feat there would be no difficulty in transferring an object from the outside of a square to the inside. It would simply consist in taking it up and putting it down in a different place. Such occurrences and others Farmer witnessed. He believed they really happened. They made him believe in a three-dimensional space. He had that impact of the senses which was the only way a scientific and thoughtful Unaeans could be got to believe anything. And this impact of the senses, this seeing and touching in the curious and roundabout way I have described made him believe in the third dimension. When the first step was taken, of course, and when he mentally habituated himself and became familiar with three-dimensional shapes, they afforded no more difficulty. They were evidently natural, and he saw it was absurd to limit existence to a plane. But his enthusiasm over his new conceptions led him into quarrels and disagreements with his contemporaries. He found it expedient to retire to a little property he owned in Scythia. There he shook off the load of other people's disapproval, and in solitary blessedness lived himself into the knowledge of three dimensions.

Nothing could have equalled Hugh Farmer's surprise and annoyance when his beautiful niece appeared and announced her intention of studying science with him. He told her he had absolutely no time and retreated into his inmost den. But she busied herself in his rooms, putting

flowers on his shelves, and when hunger drove him out, he found it not so disagreeable to sit down opposite a fresh young face.

As is often the case with people who really know something, he was the last kind of a man for a young person to go to in search of information. He began to think aloud.

"Have you never thought it strange," he said, "that there should be two shapes, each of which is exactly alike in its disposition of parts, but such that we can't turn one into another."

"There are not any shapes like that," she said.

"Yes there are," and he showed her two triangles and pointed out that each had the same angles and the same lengths of sides, but one couldn't turn into the other, however much she moved them about.



* It is difficult to follow the old man's argument, but if one cuts out a couple of triangles like these (1 and 2), it is easy to see that keeping them against the surface of the paper they cannot be made to coincide.

Laura looked at them, and they reminded her of the little make-believe figures, the dolls she played with as a child, for those dolls were cut out in the form of triangles, and the triangle turned one way was always used for the boy doll, and the triangle turned the other way for the girl doll.

"They are like the dolls I used to make," she said, "one is like the boy doll and the other is like the girl doll."

"Yes," he said, and could you ever turn one into the other?"

"No," she said.

"Why not?"

"Why should you want to?"

He groaned. "I didn't say I did want to, but if two things are exactly alike they ought to be able to be put in the same space."

"Of course they ought," she said, trying to please him.

"Well," he said, "if you think a third dimension you could turn one into the other."

"Oh, I have heard of the third dimension," she said.

"Yes, what do you know about it?"

"It is where our souls go, our spirits, I mean; of course there you could turn one into the other. That's what they mean by saying that there is no difference between men and women in the land above--it's just the same for dolls as for us."

"I didn't know your father had an idiot for a daughter," said the old man, and went off to his den.

Laura rather liked it. It was so different from the way she was generally spoken to. In fact, her uncle impressed her tremendously. And that he didn't like her, nerved her to do battle to win him. His books were all around. She took one to her bedroom, and failing to make any sense of the signs began to copy them out, and learn how to make curious marks of that kind. In the stillness of the night she frequently heard a tramp--up and down, up and down--and when she fell asleep it had not ceased--restless, nervous steps, as of some caged and suffering creature. She looked at her uncle nervously the next morning. He did not look any different, but she was sure he had hardly slept.

"Uncle," she said, "what is it makes you so unhappy?"

"Why do you think I am unhappy?"

"I know you are."

"I am an old man and must die soon."

"But all old men are not unhappy."

"Ah, but they leave the world young and fresh. Even before I go a wave of cold will strike us all, and lakes and seas will freeze. No green thing will blossom, only a few in deep caves, or, with soon-to-be-extinguished fires, will struggle on in a miserable existence that will be the end of the greatness of our earth."

"No, Uncle," she said, "you exaggerate. Papa told me something of this. He said the winters would be very bad; but I am sure it will not be so bad as you think."

"Child, your father mercifully hid his knowledge from you."

"Oh, Uncle, is that why he looked so worn and sad?"

"Yes. To bear a hopeless secret like that is enough to make him worn and sad. Only its absolute certainty could force him to admit it. He sent me the work he had done and I found that his calculators had taken the favorable supposition in every doubtful case. I do not blame them. The alternative is too terrible. On the most favorable supposition after the next meeting with that great planet, Ardaea, our earth will swing into a new orbit--we shall go far out into cold space till the earth is frozen deep, then we shall rush back so close to the sun that every day the surface of the earth will be seething hot. Perhaps some of us may maintain bare existence in deep caverns and hollows."

"If you are sure of this, Uncle, you ought to tell it that we may all prepare."

"Prepare for what?"

"Why, dear Uncle, our bodies are not all. If you or I die we know that our souls survive, and are judged by all the good and ill in our lives. You ought to tell everyone."

"And let them destroy all law and order in one short carousal? No, Laura, you do not know the world. There is more common sense in the common people than in all your bigoted idealists. We are here for a work and not for a theatrical play to manifest good qualities, and if men know that this work is to come to an end the fallacies of their preachers won't have any effect on them."

"They are not fallacies, Uncle."

"They are worse, Laura. They are interested deceptions. It grinds my heart out, child, to hear those glib preachers showing the way so confidently on evidence which no ordinary man of business would trust for the simplest speculation. If we have learned any one thing more certainly than any other, it is that we can only know about the proximate. We can take and take again, one little step forward. But all they do is to start from the ultimate. They know, forsooth, what is, and from that they deduce what must be."

"But you believe in God, Uncle?"

"I don't know what they mean by *God*. All theology is a vast fiction beginning from the wrong end, which prevents our finding out that proximate *higher* which we might have a chance of knowing. The fools," he muttered, "with the tools to their hands and with their eyes gazing to heaven--refusing to use them. Refusing till too late."

Thrilled to the heart with the fire of his gaze, Laura struggled with the enigma of his emotion. It was not helpless mournfulness that weighed him down--not despair; something else than the doom of the world filled his mind, something he did not want to tell her. All at once she said, guessing his secret thought, "Uncle, you could save the world!"

"What has your father told you?"

"Nothing. But I know you would not feel as you do if you could not."

"But no one will listen to me."

"Look, what is the good of hating anyone? They are all really in earnest. It is only because they don't understand you. Go and talk to the learned men who find out about the earth and the stars."

"You do not understand, Laura. The dogmatism of scientific men is stronger than the dogmatism of religion, because they can prove they are right. They can appeal to the evidence of their senses.

"I, too, was like them, and believed that I, my power of thinking, and every faculty I had, was produced by the things around me; that the processes I knew of would make me if only I sufficiently understood them. I laughed, the idea of a spiritual existence apart from matter to scorn. And as to a third dimension, it seemed to me ridiculous to make an assumption for which we had no evidence. But I gained the acquaintance of a man of perfect loyalty and veracity, who was gifted with singular powers. He claimed to have communication with the spirit world, he showed me many things that people account miraculous. What I noticed was that these wonders were things which it would be easy for three-dimensional beings to do. Scientific men

called him an impostor and cheat. But I knew him too well to join in the chorus. He made me believe in the third dimension by the only evidence I would accept--the evidence of my senses. And, Laura, I am proud to say I stood by my benefactor. It was the only act I can account worthy of a man in my whole life. It's a little thing you would say, just to declare that certain things happened to little bits of matter. But it cost me every friend I had. I could not even retain my poor and insignificant position. It is as much as anyone's professional reputation is worth to have anything to do with me. If I had an experiment as clear as day they would ascribe it to trickery. And, Laura, it is this truth that would save us all if men would only believe it."

"But," said Laura, "if you believe in spirits, the clergymen would listen to you."

"Much good that would do. I tell you, Laura, that those men are so versed in unrealities that, if anyone were to tell them of how what they talked about were possibly real, they would like to burn him alive, if they could still keep up their taste for that sort of thing. No, they have a closed system of their own; and their idea of thought is to try to make out exactly what is written in old books and find out whether this man or another really lived when he is reported to have lived. That's the kind of stuff they give to a perishing world."

"But if they make people better?"

"Yes, yes; it's their thought I'm thinking about; what they really understand. I've tried your father. I am always trying the scientific men, but they politely return my work. I know what they think of it."

"Uncle, I know someone who would help you."

"You are very beautiful," he said, as he drew her to him, "there is someone who loves you very much."

"Why do you say that?"

"My dear, I know it."

"Uncle, I will be frank with you; somehow I feel that I can tell you. I love someone very much. He has never said anything to me, but I hope, indeed I am sure, that he loves me. I feel this way about it. There is a great fountain of love from which we all drink. Now I love many people and think about them frequently, but there is one whose being gives color to my every thought. Everything I think or do or say in some way relates to him; and when any beautiful thought comes to me, it turns to him. Now, Uncle, do not laugh at me. I am not investing him with supreme goodness, I simply feel as I have told you about him. And when I think of all these things and how much of his individuality has become the best part of me, I cannot help believing that he must in some way absorb something of me."

Farmer took her hand. "Thank you, my dear, for letting me see your heart. Yes, I think he must love you too. Do I know him?"

"He is Harold Wall," said Laura.

"I knew his father. After the great war he could hardly speak our language. He used a dialect which had sprung up in the long journey. To the end of his life, he was the same--rough, uncultivated, unable to adapt himself; men honored him for the way he had hurled his men

through the deserts, but did not love him. His life was used up in that effort, as mine has been in mine. Perhaps his son will understand that I, too, have ventured and succeeded, when to everyone else I am a drivelling dotard, speaking in a scarce intelligible language. I suppose," he added, "your father does not look favorably on him?"

"He has never spoken, he is too proud. If he did care for me, he would never speak."

"That is well. Laura, something tells me that the tie that binds you two is very deep and true. You must not think, as other lovers often do, only of one another; but out of the great tenderness and truth of your affection, you must turn and give yourselves--give one another--to help and save us all. Now write to him, giving him a message from me. Tell him that he can save his country."

Laura 's Letter

Lone Mountain

Dear Harold,

I am staying with my uncle. Before I left the city I saw a great deal more of my father than I used to. And I found that there was something weighing on his mind, something that he kept to himself. Only he was very angry because he thought I guessed it.

We have been living in ignorance of a terrible danger that hangs over us, over the whole world. My father knows of it, my uncle knows it. If you go to the Director of the State Observatory and tell him you come from my uncle he will not deceive you, though the danger is kept secret. It is this. The summers have been growing hotter and the winters colder, because we are attracted out of our orbit by Ardaea.

In a little while we shall be frozen to death or burned up alive. My uncle knows a way of saving us. Please come and let him tell you what it is. By himself he can do nothing, But with you to help him he can bring us to safety again

Yours

very

sincerely,

LAURA CARTWRIGHT

If one of us had taken the journey Wall took in response to this letter, had passed the crowded cities, the straggling villages and solitary dwellings on our way, we should have felt a strange sense of isolation--as if our unshared knowledge was phantasmal, and all those unconscious people in the possession of the truth, not ourselves.

How could the age-long routine of business, barter, trade--the intense and urgent solicitude of every man in his own affairs--how could the absorption of each man in his own microscopic corner be interrupted! By dint of their intense preoccupation in their own individual affairs, the race has surely won the right to have the basis on which all rests undisturbed. The firmament, the arch of sky, the mutations of the seasons, the fabric of the earth, they at least must be secure. But Wall had wrung the secret of State from the unwilling astronomer and accepted it. He believed in the interplanetary vicissitude and was prepared to consider means of averting it. There was no lack of events which he could have looked on as ominous and significant. Great storms had beaten on the shore. A tidal wave of unprecedented magnitude had caused serious damage to the ships prepared for his expedition. The frightened colonists refused to sail till the

sea was settled to its usual calm. But his attitude, his readiness to believe and act upon a theory can only be explained by the history of his people. We must remember that Unaea owed her existence to an idea--it was the idea of the circularity of the earth that saved Unaea from destruction at the hands of the Scythians--and therefore the Unaeans had a different attitude with regard to ideas to that which we have, for we belong to the barbarian hordes who swept off the face of the earth the people who had ideas--the Greeks and Romans. Ideas are to us of incidental assistance, but we feel that essentially we can do very well without them. The Unaeans were different, they had a faculty of realizing and acting according to ideas which seems strange to us. Our history is as the Astrian history would have been had the Scythians overwhelmed Unaea, and plunged the nascent star of civilization into long centuries of eclipse.

At this epoch of his life, Wall was free from those charges of unbridled and self-seeking ambition which were afterwards levelled at him. His life, if obscure, had been simple and straightforward. For so young a man, he exercised a remarkable influence over his comrades, due perhaps to his power, which showed itself so often at a crisis of coming to an unexpected but irresistibly incisive decision, sweeping the minds of all along with his own--an influence perhaps due, in some measure, to the hidden passion which lay behind all his frank comradeship, giving a touch in his intimacies of that zest for the unattainable, that reaching beyond the obvious bounds of fate which lies latent in everyone.

Some would look on him on this journey as filled with an unscrupulous ambition, preparing to strike with the subtlest instinct of success. And this no doubt is true. Strictly speaking, his course is indefensible. But there is another side. Let us look on him that last night of his journey as he hurried on.

Slowly Ardaea rose, the hymned of mortals, the divine orb, the legended cold lover of the earth, towards whom poets had ever turned lavishing their adoration. She slowly rose, strangely ardent, and burning bright, for at last that cold heart was touched: the chaste and solitary, the huntress of the skies, had turned from her lonely path and, responding, was already swerving in one moment of the giddy whirl of passion to draw her earth lover to his endless death. But innocent! Away with the fables that lend the appearance of purpose to the course of things. In the appointed revolutions of the orbs of heaven, in those great secular changes, there is but inevitable law, and in the cold rhythm of the cosmos, the warm pulse of heart, the plan of mind, and all the fabled legends of the soul of things, is but as the splash of a pebble in the ocean, signifying nothing.

Yet wherefore this throb? This life passion that he felt rising within him as he drew near his journey's end? In the suffusion wherein all his being lost itself in another's, in this was there not something as great as in all the world's inevitable course?

Thinking of her and all she meant to him, he entered on a different path, a different way to that wide contemplation of vastness, but in this intimate, most secret, and real communion he arrived at something as true and as strong as all the substantial distant phantasmagoria of earth and skies.

Did she not tell him there was hope? Himself and her in the face of this great catastrophe, were not alone. Love and trust and hope had ever been, had ever faced the vast mechanic universe. What of the age-long revolutions of the planets, had there not been age-long efforts of true men. Incalculable vast forces went to the swinging of the orbs of heaven, but also incalculable vast forces, age after age, and generation after generation, in the beating hearts of men, labored there also, built up their edifices, prepared their powers. And in the army which had saved Unaea,

which, now abandoned of its use still strangely lingered on, for all its forlornness yet capable of predominance absolute, perchance that army now by gathering all the forces of the land, gathering them from ineffective hands, might save the earth--what else than some such message could her letter mean?

Harold found himself in the presence of an old man, bowed and emaciated, but of a ponderous brow and keen gaze, and his love stood by silent. The old man asked him: "You have questioned the astronomers?"

"Yes, they have left no doubt in my mind."

"In the greatness of our peril," said Farmer, "all that human ingenuity has devised stands for nothing. No known force can alter the orbit of our earth. The event is hopeless as far as our science goes."

"That is the opinion of those who have studied the question."

"But it is hard to set a limit to what is possible. What men think possible depends on two elements, not one. It depends on the facts and on their ideas. Now, science has been concerned in developing a certain limited range of ideas--they are a few out of the many ideas of the past--just the few which we justify by observation and experiment. But there are many more ideas than these, and I believe that our path lies more in acquiring new ideas than in the one we have trod for the past few centuries--in working out the consequences of the ideas we have.

"There is one idea which I have been trying to live into all my life, and which gives a perfectly new range of thought and physical possibilities. It is the idea of a third dimension. According to it, when you think you are in empty space you are really not so. To prevent your moving in the third dimension there must be some physical cause, a source of resistance. This is the alongside being, a substance with which you are in contact whenever you move, which you never can become aware of because you never leave it, you are like a particle slipping along a smooth edge--the edge prevents its moving except in a line.

"Now, along this alongside being, there are all the directions of motion possible which we can point to, and by acting on this alongside substance we can hinder and change our movements. The means, and the only one by which we can escape the catastrophe, is by acting on this alongside substance to deflect the course of our world. This can be done. I will explain how."

Harold answered, "To say that there is something besides space which stretches infinitely all round us sounds to me absurd. You have a scientific theory, put it before the learned bodies, you can convince them if it is true."

Farmer made a gesture of resignation, but Laura seized his hand in her warm grasp and smiled encouragement, whispering, "He only wants to find out what you have done already."

The Orbian

Wall found it an easier task than he had expected to gain Farmer a hearing, there was a vague sense of uneasiness and expectation spread abroad. Some vast excavations undertaken by the government in regions where no one had hitherto thought of looking for coal or ore had given rise to a sense of mystery and secrecy.

He himself said nothing of the threatened calamity, but chose auditors of whose judgement, discretion and silence he was well assured, to hear Farmer's message.

Most unexpected of all his successes was the ease with which he gained a hearing for Farmer from the head of the Orbian church. The incidents of the scene are worth recording, as they show the difficulties which attended the promulgation of Farmer's theory, and the arguments by which he endeavored to overcome them.

The Supreme Pontiff of Unaea, the head of the oldest religion in the State, in which the impulse towards efficient organization and the detachment from the ordinary life of men on the part of the clergy had gone hand in hand through century after century, sat in his audience hall.

Around him were priests who had made each branch of human effort or learning their life-long task, each one tempered to the maxim of absolute obedience, so that when the fiat had gone forth from the frail man, the vice-regent of God, no doubt or hesitation crossed their minds, but that became accepted fact which before they discussed with the utmost freedom and subtlety.

Before him stood Farmer, seeing in him the embodiment of all he hated, the supremacy of something else than reason, the haughty claim to judge otherwise than by the proximate--the prime cause of all error, the reason why the misdirected efforts of men hung bitter and bereft, cajoled and chidden from the true path to the apprehension of the world.

Standing proudly before the frail man--who, sunk in the great throne and robes of state, received him with preternatural silence and abstraction--Farmer began to tell of the astronomical situation and the approaching destruction of the earth.

The pontiff's eye flashed for the first time. "You may assume that as known," he said. "The time for the harvest is brief, and the laborers few. I pray you use all brevity."

This calm acceptance of the situation at the center, whence not so much as a ruffle had spread over the surface the church showed the world, impressed Farmer. They knew all and showed no signs of trouble! How different to his own agitation, the attitude of these men, who but saw in the end of all a more pressing call to their work!

"Holy father!" he said, using the mode of address of the faith "I will be as brief as is consistent with the difference of our ways of thought. I come to you because you control the effort of half the world, and if you consent to direct it in a certain way, you can avert this calamity."

"Speak on, my son."

"The beginning of my thought was that everything is in space.

"Every person with whom we come into contact we know as a being in space; every act of our practical lives, every thought we have is derived from things and persons in space; even the revelation in which you believe has the same origin, it comes from a man who was seen and touched.

"And if everything real that we know is in space then that which is not in space is not real. An immaterial existence is nothing. Hence it seemed to me that the only way to know more--to really know it, not imagine it--was to acquire more and more knowledge of things in space.

"I would admit that was much in the universe, beings, persons such as you claim in the traditions of the church; but the only way to know them is to know them as space beings.

"And with this view, the supposition that space had more than two dimensions seemed to me important. Possibly your miraculous accounts might be distorted, and fantastic views of real things and beings we might rationally know in this higher space.

"Possibly, also, much that is unexplained in science might be found to be obscure because of this same fact of space being three dimensional.

"But I was in this position.

"Imagine a man in a society where justice reigns, if he has no sense of justice how will he recognize the part it plays in the institutions of society? It would be no use his saying that everything that is inexplicable is caused by justice. For there is, no doubt, much that he does not understand of every kind.

"The only way for him to learn about society is for him to form the sense of justice in himself, and when it is formed in him he can recognize the workings of justice about him.

"And, in my case, I had no sense of the shapes and movements that could exist in three-dimensional space. The only way possible to tell whether there really were three dimensions was to form the sense of three dimensions in myself.

"Accordingly, though only a two-man myself, I made an account of the simplest things a three-man would have before him. I made objects which represented what a two-man would know by sight and touch of a three-man's objects.

"And I found a sense of three-dimensional forms and motions wake in me. They came to seem quite natural to me. It was as if I were really a three-man, and only confined by the condition of my bodily experience to a two-man's thoughts.

"Starting from this assumption, giving the necessary labor to develop my sense of three dimensions, I have come to recognize clearly that I am really a higher being in face of a higher reality, and can discern something of the undreamed of range of power and opportunity that lies before us.

"What is the relation of the three-man to our bodily frame? We know that we do not perceive outward things directly. Tracing what happens when we see or gain any knowledge through our senses we find that certain changes take place in us. It is these changes that affect our consciousness, not outward objects directly. The incidence of the world of things in that which properly perceives takes place in processes of extreme minuteness."

One of the professors of the sacred college interrupted Farmer at this point by saying:

"You come then upon the mystery of thought. Thought, personality, the self is immaterial and cannot be explained by any of the principles of physics."

"No," replied Farmer, "all I do is to say that before you come to the mystery of self and personality, there is an intermediate domain to explore. Without touching on the mystery of thought you can examine the processes in this domain.

"When you come to the minute operations of nature you come to actions in threefold space, and that which really animates and directs our corporeal frame has this very same kind of activity.

"The three-man is small compared with our bodies, but mere size is no bar to any complexity of structure. We are three-men directing the activity of corporeal frames limited to twofold movements.

"But then the question comes: If there are three dimensions to space why do we only perceive a two-dimensional world?

"There can only be one answer. Because we are limited. In these bodies our freedom of motion is hindered, we can only move in our corporeal frames in two dimensions because something prevents us, prevents all things, these planets, worlds and suns from moving freely.

"That which prevents us I call the alongside being. In whatever direction we point and look we do but choose a direction along its boundary, never a direction into it or away from it. And, with the recognition of this alongside being, at once a new field of possibilities opens.

"If we were free in space there would be no way to influence the course of our planet.

"But, being always in contact with this alongside being, if we were able to drive a spike into it we should retard our motion. Also, if you study three dimensions, you would intuitively understand that there is the possibility of pressing an edge into it, so that by properly placing the edge against the alongside being the motion of one's body could be deflected."

At this point Farmer paused, expecting an objection, for this possibility which we can express so easily by the word "skating" was one which offered great difficulties to the Unaeans comprehension. We see that a body sliding on a smooth surface can easily be deflected. For instance an ice boat, on the surface of a frozen lake, can have its course altered by altering the inclination of the edge of a blade which bears on the ice. But to the Unaeans such a process was entirely inconceivable.

"It can be admitted," said the professor of the sacred college, "that in a space of the kind you imagine there would be possibilities of varied kinds, and the one you suggest may be one of them."

Farmer continued: "I can assure you that this possibility exists, and I connect it with the persistent accounts which have been handed down of people's rising in the air, of a power of rising above the influence of the earth's attraction.

"The origin of all these accounts is, I believe, an obscure sense of the existence of an alongside being and a hidden feeling of a possibility of directing ourselves otherwise than by contact with anything we can see with our eyes or touch with our hands

"Such a power of directing the movements of our bodies up or down is trivial and unimportant. But it has a bearing of vast importance and consequence. We are on the earth, our bodies are parts of its mass, and any direction we could give to the motion of our bodies, by uniting together the efforts of all men, we could impart to the earth.

It is plain that if we could direct the course of our planet we could avert the dangers which our too-great proximity with Ardaea will bring

"We have no outward means of acting on this alongside being. We two-men have no such power. But the three-men, who are our real selves, these three-men have the power.

"By thinking of rising, of soaring through the air, the three-man, who is my real self, calls into play activities of his own.

"He acts on the alongside being, he puts an edge into it, so that the motion my body has in common with the whole earth is deflected and I have an upward tendency. I have put this to the proof. I have found that my weight becomes less when I think such thoughts as I have described.

"Now, if all men were to join together in worship, thinking of themselves as rising, as soaring like angels through the air, they would produce a force which would be enough to cause a certain deviation of our planet's course, a very minute one it is true, but all that is needed is a very minute one. Thus we could pass Ardaea in safety."

Farmer's theory was two-fold, first, that by a grouping and rearranging of the molecular structure of the brain, such material changes could be effected as would cause a body slipping over the surface on which all Astrian things moved to be deflected in its course; and, secondly, that by thinking certain thoughts such molecular changes were produced in the brain matter of the thinkers. He postulated an accord between the conscious thought of rising and soaring, and those minute changes which by a process quite unknown to the thinker would bring about the realization of this thought of rising and soaring.

To convey this idea was a task which presented almost insuperable difficulties. He had exhausted the known resources of the Unaeian language, and had said all that could be said to men who had not followed his path of thought. Therefore, addressing the supreme pontiff, he concluded with the following words:

"I come to you, for you have the direction of the religious effort of half the human race. If you would decree a form of worship in which certain thoughts should be followed at certain times, and all the fervour of your congregations united, you would set those processes at work by which the three-men, our essential selves could save the world from its approaching catastrophe.

"Holy father, have you any question to ask me?"

"No, my son, receive the blessing of an old man who, like yourself, has striven to be faithful to the task allotted him."

And so the conference ended.

Laura found her father agitated beyond description at her absence.

"My daughter," he said, "I have long been intending to speak to you on a very important subject, but have put it off. I must not let this occasion pass."

Laura told him she knew everything.

"It makes my task the shorter," he replied, "I have decided that the time has come for you to take a husband."

"Not now!" she exclaimed.

"Yes, my girl, some few of us may expect to survive. I have prepared subterranean chambers, which will be stored with all necessary provision; there some of you can pass the time of transition, and emerge to the new order of things."

"Papa I'd rather die than be shut up like that."

"It is not what you wish. We must strive that some of the best of us, those most fitted to carry on the destiny of our race, shall survive. It is not your part to question--the decision lies altogether beyond your power to alter. And I can easily remove any hesitation you feel. I know you were attracted to that man Harold Wall. Whatever you may have felt for him cannot remain alive a moment longer when I tell you he is making use of this approaching calamity to stir up sedition. He is consumed by a reckless, unscrupulous ambition. He has taken hold of the fantastic moonings of your poor uncle and, using them as a lever has tried to persuade a number of weak-minded sentimentalists that there is some way of avoiding the danger. He is trying to make this world-peril the occasion of promoting disorder and securing his own ambitions. He has been unceasingly active in drawing closer his relations with his fellow-officers, trying to make them traitors to their oath."

"Papa?."

"Yes. So well has he chosen his confidants that we have had no direct evidence, but the army is penetrated with the knowledge of what I tried to keep secret. The panic that reigns has enabled us to pass special measures. Before nightfall he will be arrested, if he resists, he will be killed on the spot, no mercy will be shown him--he will be sent to Septentriaea--not as leader as he might have been--but a convict. You can understand the wickedness of the man when I tell you that we have decided to employ a company of Scythian soldiers. We cannot tell to what extent his machinations have gone with the regular troops."

Her father turned on her the full force of his implacable regard. She felt the iron resolution and the unyielding purpose by which he had won his way and beaten down every opponent. In her powerlessness her only thought was of some means of warning Harold.

He took her silence for submission. "One who has long loved you and who, I believe, has not been without encouragement, is here today to urge his suit. You will listen to the dictates of your own heart and of my wish if you accept him."

"But, Papa, I have given encouragement, as you call it, to so many."

"You must know who I mean Mr. Forest."

"I like Mr. Forest very much."

"Let's have no beating about the bush, my girl. You agree to accept Mr. Forest?"

"How can I say before he asks me."

"No nonsense, girl."

Laura's heart quailed, she was desperate, she must send word to Harold at once. What if she bound herself for life if only she could save Harold now!

"Yes, father," she said.

"Understand me clearly, Laura, you were seen talking to this Wall only today. I will not have you implicated. You will not be allowed out of my sight, or away from someone equally competent to guard you till you leave my house for good."

"You don't place much confidence in me, Father."

"How can I with a telltale face like yours--no, Laura, you will thank me some day." And he left her.

When she looked up, Edward Forest was before her. "Since you have consented to see me I begin to hope. You have known that my love is yours, will you accept my lifelong devotion?"

Her silence gave him courage. He kissed her pallid unresponsive lips. It was too much--what was all her assent, her submission for if she could not save Harold. Just because her father had taken prudent precautions to prevent her betraying him she felt outraged.

She pushed him away and said, "I wish I were dead."

"Laura, how have I offended you? Your father told me that you did not dislike me."

For a moment she struggled--he looked so forlorn, and a word from her would bring such joy into his face, he would do anything for her. She was sure she could cajole him into taking her message for her. But into her mind came Farmer's words, "Truth and straightforwardness find a way when all other means fail."

She laughed merrily. "Don't look so dejected, Edward," she said. "Papa tricked me, I said I would marry you just to get a chance of speaking to you alone. I suppose if you insist on it you can have me, but there's something much more important than that."

"Nothing to me," he said, "if the world came to an end tomorrow."

"But it isn't coming to an end, we are all going to live happily ever after and you can help, help more than any one man living--you don't know the good tidings and the hope, do you?"

"No, Laura, I've heard that there can't be any."

"Then, Edward, you believe that God made this beautiful world just to be destroyed like that!"

"It makes me not believe in God."

"Edward, I will tell you all about it. You know that in old times men had messages from God that told what His will was."

"Yes, I've heard so."

"And did you ever wonder why it was always through men, not by some great being appearing as big as the sky?"

"No, I have always taken those things on faith."

"Well, I will tell you why. What do you think you are really your very soul? Don't you think it is something like your body, only filmy and shadowy, not exactly real, but shaped just like your body?"

"Yes, I suppose that is how I think of it, if I think of it at all."

"But that's all wrong. I'll tell you what my uncle says. He has found out that what we call all of space is only a little bit of it. And we are curiously confined in all the movements our bodies make. There are really three dimensions not only two. The real world is a world of higher space. If we want to think about ourselves in a world of higher space we must go the other way first, and think about a being in a world of lower space. Think of a little creature that is confined to living in a straight line. Such a being would not think of its support at all, but would think what was in front of it and behind it made up all space, and would not recognize that it was on something. So we, in the threefold world, are supported in a direction we do not know. And just as the line being must really have some thickness, so we have a thickness in a way we cannot point to.

"Now you know that we are told that our souls have come into a world of matter and have taken on themselves the limitations of it. The case really is this: Our souls, which are these higher beings, have come into a part of the universe where the work to be done is in this twofold space of ours. It is as if one of us went into a very narrow tunnel where there was only one direction.

"What this work is we do not know yet, but the beginning of it is to conquer the difficulties of the world, and to live all together unitedly, so that when we know we can act together. And the souls that come into this world form united bands, a great many of all degrees join together and animate a body, but all of them are under one soul which is one's real self. And this real self soul directs all the others in the body, like a captain directs a lot of men in a ship, each has its work. And the directing soul that has the business of directing our actions this soul almost forgets its true being; it is very faithful to its work and is absorbed in it. It thinks it has only two dimensions, and nothing it can see reminds it of its true existence. We are hidden away from all the other souls of the universe, like a man in a narrow tunnel would be from us. If the other souls want to speak to us they have to enter into our conditions, they have to put on one of our limited bodies--that is why the voice of God has always come through men. And now God knows that there is a great danger which will spoil all the work He has sent us here for, so He has sent a soul with a message of what our real condition is, so that recognizing our own true way of acting, not the body's but the soul's, we can have quite new ideas of working, and save ourselves."

"But, Laura," said Edward Forest, "what a curious idea you have about the soul; the business of the soul is to do right, to grow good and improve itself."

"No, that is a very poor kind of soul that thinks that," said Laura, "all the men with big souls try to do something in the world--like my father does. He has a big soul but a very mistaken one; of course, good souls would not demean themselves by doing wrong things, if they can't get what they want honorably, they would rather give up and let another try. There are plenty more. But, Edward, say you believe me, your soul must feel that what I say is true."

"I don't see that it has anything to do with the collision with Ardaea," said he.

"Ah, that is exactly what it has, for we have never thought of that support we are on, we are against something and there is a way of holding on to it so that we can alter the way the earth is going."

"Are you sure of this, Laura?"

"Yes, I am so sure, Edward, and I want to do something to help it on."

"How do you mean?"

"Oh, Edward don't you understand, my father is going to stop it all, and I trust to you."

On Forest's face came an expression so enigmatic that Laura stopped--"What is the matter, Edward, are you angry?"

"No," he said, "it was a conflict of feelings that made me frown. I do not quite know where I am."

"Here, and ready to help me," she said.

"Yes, of course, Laura," he said, "but there's something else."

"Do you not think," he went on, "that your talents would be thrown away in the domestic circle? There is the making of a most eloquent professor in you."

"Oh, don't say that," she replied.

"When I come home I shall have to call up all my knowledge of mathematics, ghosts, astronomy, and theology too, Laura. I think it would be very exhausting."

She looked at him in alarm.

"I made a proposition to you just now," he continued, "but I did not know your talents. I wonder if you could be induced to allow me to withdraw my proposal."

She looked at him puzzled, a strange mixture of relief and consternation came over her. To have no power over him at all! To have shrivelled up all his long devotion just by a few words! She couldn't bear it--and yet, not to be bound at all!

"I am waiting for your answer, Laura, may I withdraw?"

"Upon conditions," she replied.

"Yes," he said, "on conditions--I will tell you what they are--that I shall be your very best friend, and that I shall help you in every way I can. What is it you want me to do now, at once?"

"Oh, Edward," she said, with tears of gratitude flowing, "I shall never forget how you understand me."

"Laura," he said, "you are wonderful, you remind me of the prophetesses and sybils of old times. You have a great career before you.

"Now, tell me," he went on in a business-like tone, "I judge there is something very pressing--something you want me to do at once."

"Yes, Edward," she said, "it all depends on you. My uncle knows how to save the world, but gave it up as hopeless to make others join with him till Harold Wall came to him, and told him what to do. And Harold has gained him a hearing. Now my father does not believe in any of it. He thinks that Harold is taking advantage of people's terror to prepare a revolution. He has an order for his arrest, and is going to send a company of Scythians to arrest him. Now you must warn Harold."

Edward Forest frowned. "With all his judgment, your father is in fatal error. I told him this enrolling of those barbarians as a special regiment was a mistake. There is no doubt of the loyalty of the army, and if there were, such a sign of mistrust would be most foolish. I'll go and tell Wall what you say, but your father is not the man to threaten before he strikes, the blow has probably already fallen."

"No, Edward," she said, "Not yet; I know not yet. For he is keeping me a prisoner here."

"I'll go at once," he replied, "don't be too much alarmed."

In the Orbian palace, Farmer stood before the mighty assembly of prelates, priests, and clergy of every denomination. The influence and force of their natures so alien to his own seemed to make no impression on him. In a few simple words he placed his thought before them in the manner he judged they would best understand it.

"In the history of our race who can say what is the order and what is the plan by which we came upon these great facts, the knowledge of which reveals to us what we are and gives us mastery and control of our fate?

"There is no order or plan that I can discern save that somehow, when the time has come, we have seized on that which it is important for us to know.

"Thus, in the early ages when our mechanical powers were nothing and when our rational knowledge of nature was ridiculously meager, you--those with whom you are united as one in the succession of your efforts--you, I say, discovered the soul. There is something in us superior to the body that stands apart, directing it to higher ends than its mere self-preservation. But this discovery, great and all important as it was, was not complete and rounded off; it depended and depends on an inner intuition of man's nature, it was not and is not connected with the rational system of things as known.

"And gradually as the examination into the nature of the material world around us progressed, this discovery of the soul, this near and intimate knowledge became incongruous with the record of our senses.

"For we found no real place to which the soul could go, as in the earliest ages was implicitly believed. We found nothing in the body but an animal organism. And hence to this day when you give your message to the world you rely on other evidence, on other principles than those which govern the reasonable conduct of affairs.

"But I have discovered the soul again. I have discovered it not by the way of inner conviction, not by the overmastering energy of its verdict on our conscience and on our actions. I have discovered it as a real being giving as much for the outlook on this physical world as it has done to enlarge our prospect as human beings. Just as the intuitive knowledge of the soul has raised our moral being above the ways of animals, so does the rational knowledge of the soul raise our intellectual being above the ways of things.

"For in our thought we have lived a life of acquiescence in the subjection of the body, whereas, when we know our true being we find that we--our essential selves, our souls--stand clear of it. And this knowledge comes to us now when it is necessary now when even to preserve ourselves we must rise above the conditions of our subjection.

"I would lead you to the greater higher world. And do not turn from me when you think I speak of insignificant things. You tell us of highest love revealed in common offices. And we reach the freedom of our intellectual being through thoughts of common and insignificant things.

"I tell you that the thought of old time of the soul as real is right, undivested of any of the garb of our life, nay rather clothed upon more and more with an indescribable fullness of being--such you should know it--follow me and you will know the soul rationally and deliberately, as now you know it outleaping the slow steps of reason.

"The path is this. Think of a being confined to a line. You will perhaps think of an insect that cannot rise above its support, but the illustration is not correct, for inasmuch as the insect feels the support it is on, it has a knowledge of two dimensions. A being confined to a line would have no idea of anything except that which was in front of him or behind him in that line. And by the very condition of the limitation of his being he regards certain operations as impossible.

"The line being has two extremities which we may call the head end and the tail end. The head points one way and the tail another. By no possibility can the line being interchange these directions. Given two line beings, the head of one pointing in one direction, the head of the other pointing in the other direction, to them it would appear to be impossible that they should be so placed that their heads could point in the same direction.

"We see that they could easily be placed pointing in the same direction, we can turn them round so as to point the same way. We can do this because we can use two dimensions. Not being able to move in two dimensions they think this is an impossibility, they think it is of the nature of space that there should be this impossibility. But we see that the impossibility to them, of disposing themselves so as to point the same way simply shows that they are limited, that they do not possess in their bodily movements the possibilities that actually exist.

"Now coming to ourselves we find an impossibility. Think of equal right-angled triangles symmetrically placed about a straight line. We may shift these triangles for ever but cannot make one occupy the space of the other--there is always some incongruity.

Now I say that this impossibility is not a real impossibility--it is a consequence of our limitation. If we could move in the third dimension we could easily place one of these triangles so that it would fit in the space of the other. Just as the impossibility which we find is a sign of our limitation.

And now consider the line being. The recognition of the second dimension would make him aware that he was always in contact with something--his world is not a world of empty space

but of support upon something--there is, where he would think it was free space, an alongside being.

"And similarly with us when we stand upright and move our hands we think we are in free space except for the earth rim on which we stand. But it is not so, there is an alongside being for us too, and however we move we are in contact with it, along it we move our arms whatever way we point.

"And existence itself stretches illimitable, profound, on both sides of that alongside being. Realize this, it follows so that no one can doubt it from what I have said; even begin to realize it and never again will you gaze into the blue arch of the sky without an added sense of mystery. However far in those never-ending depths you cast your vision, it does but glide alongside an existence stretching profound in a direction you know not of.

"And knowing this, something of the old sense of the wonder of the heavens comes to us, for no longer do constellations fill all space with an endless repetition of sameness, but there is the possibility of a sudden and wonderful apprehension of beings such as those of old time dreamed of could we but look athwart this all of sense, know that which lies each side of all the visible.

"Such an apprehension lies in the future--what is the meaning for us now?

"To interpret the mystery of our being, to discover our relation to the wider universe, go back and ask yourselves how a line being could exist. No real being could exist in a line. A real thing or beings must have all the dimensions there are. But a real being like ourselves, possessed, as cannot be denied, of two dimensions, can be put in such circumstances that it has only a one-dimensional experience. It can be part of a structure or organization which is limited to one-dimensional movement.

"Think for instance of a ship which moves on the water. It can only move in a line. Imagine its captain directing it, if he were unconscious of his own movements and simply had regard in all his thoughts to the motion of the ship and identified himself with it, he would look on himself as a line being. But if by any means the idea came to him that there were two dimensions, if he could interrogate his own bodily consciousness, realize himself separate and apart from that which he directs, he would have plenty of experience of two-dimensional movements. All he would have to do would be to wake himself up to his own essential mode of being.

"And similarly with ourselves.

"We, essentially, are higher beings possessed of a higher kind of action than we realize in our bodily movements. This being, that is essentially ourselves, is the soul, and just as it has waked up to knowledge of itself in conduct, has recognized that it is the master of the body and stands apart from and superior to a mere animal life, so it now is ready to wake up and recognize that it is superior to the ways of things. The movements of the body are inferior to, less ample than, our own movements. The mechanics and movements cognate to the soul are superior to those it can apprehend through sense, are superior to those it sees through the bodily vision.

"The proof of this lies in trying it. I have waked up my soul, and I can think of three-dimensional things and how they act and react on one another.

"And I have found what lies beyond all I have been telling you, that just as the captain of a ship has an activity independent of the ship, so our souls have an activity independent of the body.

Our souls can act on the alongside being. We, the earth, and all slip rapidly over the alongside being in the course of our planet's motion. In any movement we make with our bodies we do but act on things all equally subject to this motion. But our souls can act on the alongside being directly. And by this action we have the possibility of influencing the directions of our movements apart from pushing against or pulling anything we can see.

"At present exactly how this is done is obscure, these organs in the body by which the soul effects this result are too minute for us to distinguish them, all that we know is that we can rationally predict their existence. And those old legends of men raising themselves or flying through the air have their basis in the very fact of a relation to the alongside being which enables a man by the activity of his soul, not directed in the way of any of our ordinary bodily manifestations, to change the direction of his motion relatively to that of the earth.

"If, filling my mind with devotion, I think of myself as soaring, as rising like an angel through the air, my soul does that which would make me rise, altering my direction by acting on the alongside being.

"If all men were to have the same thoughts, then all of them would tend to rise, and the united force would be very great, enough to influence the course of the earth in its orbit. The force would be great enough, but, unless regulated, that which was exerted at one time would neutralize that which was exerted at another time.

"If, however, we properly choose our times, then by devotional exercises, by the whole human race uniting together in the thought of a glorified rising and soaring above the earth, we can influence the course of our planet, we can effect that small deviation of our course which will enable us to pass Ardaea in safety.

"You are now face to face with the question. The danger is real. It forces us to leave off trying to explain the world by our ideas and try instead to conceive the reality."

Now there were in Astria a class of philosophers who looked on the all as one great being bent on his self development. They said that different individuals were but his ways of imperfectly and partially apprehending his own thoughts. Among some denominations these philosophers were considered to have made a valuable contribution to the support of religion, and were regarded as very profound. One of them rose up and said: "We can never go outside our own ideas; it is absurd to speak of reality as if it were any different from an idea."

"I will not stay," said Farmer, "to discuss this question, which is merely one of words. I have found for my part, that words never have any definite meaning when you take them close, but held at a distance they serve very well to point out a general tendency, or suggest a contrast. And the contrast I alluded to is plain. From our two-dimensional solids we have, we obtain by abstraction, the idea of an edge bounding them. And from this edge or line, we can make the further abstraction of a point. We can try to explain the world by using these abstractions, these ideas, or we can, on the other hand, try to conceive that with regard to which things, is we think them, are mere abstractions. We must form ideas which we have not got. And in the face of that necessity, which has occurred before now, I believe that the rough and ready way we have of contrasting our ideas with reality points to and indicates a distinction in our way of proceeding. To cope with Ardaea we must obtain new ideas, for with our present ideas, as you know well, there is no possibility of avoiding destruction.

I have found that by thinking certain thoughts, I can volitionally direct the activity of that real being, my soul. I can alter my weight. There is a power in everyone of doing this. Now an alteration of weight can only come by our acting on the alongside being, and this is the very action which is necessary to alter the course of our planet. Our souls have this power. By introducing the thoughts which produce this action into your forms of worship and inducing your congregations to follow them with fervent piety, you can alter the course of the earth and pass Ardaea in safety. Every being must sometimes come to reckon with the absolute facts of its being or perish. That is our case now. Though placed as far as our bodily vicissitudes in a two-dimensional state, we must act according to the three-dimensional reality.

"And as your congregations by this worship gradually bring safety to the world, you can inculcate the truth, which they will at first act on unreasoning and blindly; you can tell them of a real soul. You yourselves will not grope blindly about in tradition, but discover more about the soul, you will approach its study, not from the side of consciousness only, but as an objective reality. And if you hesitate to take my view, because you think you demean the soul by considering it small, you must remember, that though small in any way you can measure, yet it has a thickness in a direction you cannot point to. There is more in a square, however small, than in an infinite line. And so one soul has matter enough in it to make up endless universes such as we conceive them."

All through this speech the Orbian pontiff sat unmoved; his face, pallid and emaciated, was as that of death, to which no words can come, and his gaze was as if sunk in some profound region from which it would never return.

The first to take up the word was a bishop of the Literal Church whose doctrine was a faithful adherence to the sacred texts.

"Brethren," he said, "in commencing our deliberations on what we have heard, our first thought must be, 'How does it agree with the message we are pledged to deliver to the world?' Ours is the message of salvation, not of mere earthly good, and we must not let any promise, however fair, quench the light we have, or tend to weaken us in the promulgation of the truth."

Farmer broke in: "Yes, you see that it destroys every vestige of what you teach and inculcate. For want of anything else real to think about, you identify yourselves with these bodies, and all your notions of right and wrong are centered in the bodily relations. You believe the earth is a place for the display of virtues. What you eat, drink, how you marry, get unmarried, how you tend your own and your neighbor's body--that is all your thought. Not a glimmer in all you teach of the real work of man, but pitiless immersion in the utterly insignificant."

Wall could detect no sign passing from the Orbian chair, but some indication must have been conveyed, for a great prelate close to the pontiff rose.

"Our thanks are due to Mr. Farmer," he said, "for putting so lucidly before us the real question for our consideration. Mr. Farmer has arrived at a new conception of the body and, if he is correct, it will require a reconsideration of our ideas with regard to the soul. These two aspects can never be confounded, and his criticism of us in the light of his new conception of the bodily, will be most welcomely received. But that question has nothing to do with our present deliberations. They are, I take it, directed to our practical action."

These few words sufficed to turn the discussion to relevant topics. A period of earnest debate set in, and the minds of the participants were so absorbed that they paid but scant attention to

the shaking of the walls when the earthquake came, and paid no attention to the messages which told them of the disturbed state of the populace. One speaker after another gave his reasons for and against Farmer's views, and gradually the sense of the meeting came to declare itself in favor of making a public exposition of them in every part of the earth, and bringing all possible pressure to bear on the government to appoint a commission of enquiry. A motion to adjourn was proposed. But Wall stepped forward, his heavy sword hitting the steps to where he descended in their midst.

"There is a voice," he said, "which speaks within every man, telling him at the last extremity what to do. That is the voice of God. And in you is the voice of God to men. Many times before now you have declared it. It is no time to turn this way and that. Either this man is of God and we believe him, or he is of the devil and we leave him. Before you I lay down a staff"--and he made a gesture of flinging something before them--"it is an iron staff and whom it smites it crushes. It is the army. Its honor is in obedience; if you command it in the name of God, in whose name stands the vow of every commission, all other allegiance is dissolved. As one man waiting to hear the voice of God, the army stands before you."

The solemnity of the moment grew clear to them, as the indescribable weight of the man who had spoken pervaded the silence. Almost it seemed as if no breath were drawn in that vast gathering. One word would unchain the deep. From the loosening of that incalculable power embodied in that one man, the men of peace shrank, appalled at his simple words. . . . The Orbian pontiff and all his priests, prelates, and monks had arisen. From the lips of that frail old man, came a voice clear and solemn.

"God has spoken," he said, "through the voice of the servant whom he has chosen, he has saved the world." Then, placing his hand on Wall, he said, "I absolve you from your oath. Take the message of Salvation forth to the world."

[Wall takes control of the country and the Unaeans begin a regimen of daily prayer according to a schedule designed by Hugh Farmer. The prayer consists of thinking one is an angel soaring upward towards God. Meanwhile Cartwright seizes the arsenal and tries to start a counterrevolution, but Wall overpowers him. For awhile Laura and Harold each think the other doesn't love him, but things get straightened out. Finally it is time to see if Farmer's plan has worked.]

Conclusion

Observations of the utmost precision taken daily for the space of two years, were submitted to the closest scrutiny and worked at with the utmost care by skillful calculators. And as a result it came out that the planet's course had diverged by a sensible fraction of a degree. Shown, made manifest, marked clearly as by a finger pointing to it, revealed by their changed direction in space, there came to all a consciousness of their collective will. It was as the awakening of a soul to its embodiment in a corporeal frame, the thrilling joy, the wonderful, the inexplicable power of movement--this had come to Unaea. The inhabitants of Astria knew that in their cooperation together, a being transcending them had begun its autonomous course.

The ranks of sound understanding crumbled, the platform of educated opinion was swept away.

"Et pur se muove," the great words which mark the beginning of the apprehension of life, whether intellectual or physical, had sounded, and this planet, and all on it together, swung into their new course.

Cartwright's journalistic campaign, so elaborately prepared, was defeated before it began. It was true that the motions and movements with which the astronomers dealt were so small that some expert critics held that the whole result was doubtful, and could be accounted for by errors of observation. But such carping voices gained no hearing, for two reasons.

In the first place, the winter instead of coming in with a violent wave of cold, began mildly and pleasantly, and in the second place a change in the thought of the people took place.

This most real and living space we know can be looked on as an instance of the laws of combination and permutation, and its properties can be deduced from an algebra, or it can be looked on and loved for its own sake. The mind can grasp it more and more fully in its direct complexity, knowing it at first hand as real even if removed from sense by its amplitude in unknown directions.

But who can say which is best? The magic of algebra or the love of space?

In Astria, at any rate, it happened that all the wielders of the combinations of one and two and three, and all the designers of all the possible configurations that could happen from abstract principles in this higher space, failed to detect any hang-hold of Farmer's theory on actual fact.

But amongst those who learned by means of models, making visible and tangible the aspects and views of the higher reality, were some who sprang, with a kind of inner awakening, to the knowledge of the third dimension.

And these, feeling rather than reasoning about that higher space, realized in their inner minds what these poor dwellers in a land of two dimensions could never see or touch--the actual nature of three-dimensional things moving and acting--things they could only apprehend in their plane of imagery as things succeeding things. And with this knowledge of inner sense, they brought to the examination of the minute and concealed processes which went on in nature a pattern and example which unlocked their secrets.

They found that many curious and inexplicable results, sphinx-like riddles of science, were the simplest and most to be expected consequences of the motions they inwardly realized. We see very plainly that when the particles considered are small enough, even in Astria, the movements must be three dimensional, for the things are real, and if small in a third dimension, are not vanishingly small. Thus the intimate knowledge of the third dimension was the key which unlocked the mystery of the minute. And so, guided marvellously amongst what some would consider gigantic delusions, vast mistakes, the good ship of Thought glided safe to port.

Farmer followed the work of the younger generation with interest, but also with a deepening sense of his own impotence. To himself seemed as a man denied the blessed spark of reason, for all the things he might have discovered in his long years of search were found by others, children to him in point of years. He left the busy city and the crowds of men and, half mortified, half amused but wholly glad for now the danger to the dear world was over, he devoted himself to his garden in far away Scythia. That rebellious and antagonistic mind forgot its struggles and vicissitudes in watching the little beads of verdure that sprang out of the dark earth.