

## IN QUEST OF TRUTH

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A historical pageant portraying mankind's quest for true knowledge. The substance of the play is authentic, with minor adaptation for smooth running. Part I alone may be rendered for a short program, about 20 minutes. This part is particularly suitable for Junior High School. The playing time for both parts is about 40 minutes, and is suitable for high school, college, or adult audiences.

### CHARACTERS

King Mathematics, sovereign of the land of knowledge, who has devoted all his energy to the exploration and development of his provinces.

Truth, his daughter, sought by all the worthy subjects of Mathematics.

Zero, the court jester, who means nothing.

Number } the King's attendants and advisors; dressed alike, except that the former has large numbers written over  
and Form } his suit, the latter has geometric figures. (Cf. Teedledum and Teedledee.)

Pilgrims to the Court, in quest of Truth:

Superstition, dealer in spirits and omens; dressed as a witch.

Astrology, watcher of the skies; carries spy-glass.

Soothsayer, the crystal-gazer.

Custom, a very straight-laced individual.

Tradition, the bearded old fogy.

Thales, and two other Wise Men of ancient Greece.

Pythagoras, Aristotle, Socrates, Plato.

Zeno, the Sophist.

The Oracle; Archimedes.

Ptolemy, Copernicus, Galileo, Kepler, Martin Luther.

Cardinal Baronius, John Calvin, Blaise Pascal.

Descartes, Fermat, John Milton.

Newton, Leibnitz, Cavendish, Halley.

Several 18th and 19th century Scientists.

Einstein, Eddington, Michelson, Morley.

### PART I

*SCENE: Royal palace of King Mathematics.*

*The King, with his attendants, Form and Number, are awaiting the arrival of his subjects who are expected to pay homage, and seek the approbation of his delightful daughter, Truth.*

KING: Where is Truth? I am always seeking her. I am continually working to advance her. Yet throughout my kingdom there are those who are blind to my power and who would pervert her.

ZERO: (*humorously*) Your majesty, Truth may be suppressed but not strangled.

FORM: Your majesty, pilgrims from afar are waiting outside. Will you have them?

KING: Wishing to beguile me? Or pay me homage and respect? Let them face Truth; then they can understand me better. I am so often misunderstood.

NUMBER: Aye, and neglected, sir.

KING: Truth will out. Seek ye Truth!

ZERO: Aye, sir, Truth, the whole Truth and nothing but the Truth! (*trots off stage chanting*)

*Enter Truth, in spotlight, taking place at side and slightly to rear of King.*

KING: (*bowing*) Ah, sooner or later Truth comes to light.

FORM: Your Majesty, here entereth some wandering pilgrims from afar,—Superstition, Soothsayer, and Astrology.

KING: Let them seek the light. Whom bringest you, Superstition?

SUPERSTITION: Soothsayer, who gazes in the crystal ball to tell you everything, your Majesty. (*The latter kneels with crystal before his eyes, near King.*) Also we have: Astrology, learned man of the stars, tells you what the stars have in store for you and how they control your every act, sir. (*Astrology advances and gazes at heavens, through spy-glass, hand shading eyes.*)

ZERO: (*mimicking and gazing up also*) Well, Astro, is it going to rain?

SUPERSTITION: (*glowering*) Why, good for nothing Zero, don't you know it rains only when a frog croaks?

TRUTH: (*hands to ears, shakes head disgustedly*).

ZERO: O.K., Superman, it's nothing to me.

ASTRO: The stars like lamps are held in the sky by strong ropes. The stars fix and foretell the course of human affairs. Each morning, the earth, a sleeping princess, is awakened by the kiss of the sun-prince.

FORM: What, pray thee, supports the sky?

ASTRO: Four high mountain peaks support this great canopy.

FORM: What then supports the peaks and this whole earth?

ASTRO: The earth is a circular disc floating on water, eternal water, from which all things are made.

SUPER: (*arm up*) My wise men say a giant holds it up, that he stands on the back of a turtle—

NUMBER: Who, in turn, stands on what?

SUPER: On the back of an elephant—

NUMBER: (*arm up, mimicking*) Who, in turn, stands on what?

SUPER: —On nothing, sir, but whose legs reach *all the way down!*  
(*Bends legs, dramatically, all others imitating, and staring at Super.*)  
(*Truth holds head and weeps.*)

KING: (*angrily*) Pretend ye to come here, yet, knowing me no better than this, feign your interest in Truth,—and thus put her to shame. Away! Go ye! Explore my kingdom, learn of my tools and processes, and return some thousand years hence, wiser with time and civilized progress!

(*They depart snappily. Enter Custom and Tradition*)

You, Custom, and you, Tradition, I respect you and want my people to follow you for what you have that is good. In everyday matters of hand and heart, we love thee. Stay near to my court; progress, and learn more of my ways. (*Pause*) Who cometh?

FORM: Wise men from Greece, your majesty,—and Thales, wisest of these.

(*Enter Thales and two other Wise Men*)

NUMBER: He predicted the eclipse of the sun of 585 B.C.

KING: Excellent, I hear you and your sons have been working in my Province of Geometry, one of the most fertile areas. You have done much to bring order out of chaos there.

THALES: Noble King, you flatter me. My young friend Euclid has been the brilliant organizer of that province. He has systematized geometry so well, it will likely remain unchanged for thousands of years. We acquired it from the Egyptians in very primitive form and have developed it by deductive reasoning.

KING: Who are your followers?

THALES: Pythagoras and Aristotle.

PYTHAGORAS: Noting the rising and setting of the Sun, sir, and bisecting the angle between those points, we have a north and south line, and stretching this magic rope over the lengths 3, 4, 5 (demonstrates it), a right angle is formed which faces the east; thus your temple is oriented to please the gods, and quell the wrath of mighty Zeus.

ZERO: (*taking it, and maneuvering it with wonder*) Well, I'll be hanged!

PYTH: Your majesty, I come to announce the earth is a sphere rotating on an axis, not its own axis, however, but balanced by a counter-earth out in space,—like a stone on the end of a string.

FORM: There is confusion in the kingdom as to the difference between mind and matter. What is mind? and what is matter?

ZERO: (*interrupting*) I can solve your problem, gentlemen, in zero flat:

“What is matter? Never mind!  
What is mind? No matter!”

NUMBER: That's just Zero. He means nothing.

FORM: Zero, keep in your place. Get behind the decimal point.

ARISTOTLE: All matter is composed of water, earth, air and fire.  
Liquids are almost all water.

PYTH: Ultimate reality is not in matter, but in *form and number*. All reality is in numbers and their relations. Number rules the universe.

FORM AND NUMBER: (*jumping forward*) Aye, aye! He speaks our language.

KING: I predict that the future development of science depends on them both,—Form and Number.

PYTH: Before leaving, sir, I would like to recommend one thing for your kingdom.

KING: Speak!

PYTH: I would suggest that the kingdom of knowledge be divided into four provinces, Geometry, Arithmetic, Music, and Astronomy. (*the quadrivium.*) (*King hails him; he steps aside.*)

KING: Some day my growing Kingdom will comprise many more provinces, far beyond these.

FORM: Here come Socrates and Plato.

(*They enter to center stage, arguing in syllogisms.*)

NUMBER: They know us not, sir.

KING: They are metaphysicists: they do much to add to clear thinking on which our language is built. Do not overlook their deductive reasoning on which I lean heavily. I owe as much to them as they to me.

SOCRATES: The king has just appointed Evictus as tax collector. What do you think of him?

PLATO: Far better than the last one, Liquidatus, who was a drunkard.

ARISTOTLE: If a man is a drunkard, he does not deserve the job. Evictus is not a drunkard; therefore he deserves the job.

PLATO: Your syllogism is false since no conclusion can ensue from two negative premises.

ARISTOTLE: Also, he is a well known political leader from Marathon.

SOCRATES: Yea—some political leaders are not honest men. He is a political leader; therefore, he is not an honest man.

PLATO: Again, your reasoning is faulty. In a syllogism, the middle term must be the subject of a universal proposition.

ARISTOTLE: Hark, here comes Zeno, the Sophist. He has no use for King Mathematics. I look for trouble.

PLATO: Let's stand aside.

ZENO: (*enters with tortoise over shoulder; sneering*) Ah, great logicians you! Men of syllogistic logic! Men love to be humbugged. You are men. Therefore, you love to be humbugged. Gentlemen, I can

prove by your own reasoning that nothing in the world can move. How? (*Sits on his cane, and gesticulates.*) Well, if motion is possible, a body must move either in the place where it is, or in a place where it is not. But a body cannot move where it is and it certainly cannot move where it is not. Therefore, motion is impossible.

KING: (*gesticulating*) This is an outrage.

(*Truth, hands to face, horror-stricken.*)

ZERO: Zeno, I am Zero. I thought you would know me.

ZENO: You are *nothing* to me.

ZERO: You *should* know about me. You seem to know more about nothing than anyone I've heard for a long time.

ZENO: What is your mathematical function?

ZERO: I have a new job in the King's number system. I fill in the empty columns when the other numbers move out.

ZENO: That's not hard.

ZERO: No, there's *nothing* to it. Yet, no one else can do it. The King says he's waited a thousand years for me to come along. It now gives him an ideal number system.

KING: Again, let us not argue in circles,—nor in straight lines, if we know not where they lead. Tell me this: what makes us see?

(*Enter the Oracle.*)

PYTH: Light is an all-pervading substance of colorless purity. And from it particles are projected into the eye.

PLATO: (*doggedly*) Something is also emitted *from* the eye!

ORACLE: It is by the will of the Gods that we see by day, and not by night. The earth is a princess that sleeps by night, protected by the Gods. Aroused each day by the Sun Prince who kisses her at dawn, it is then the Gods' will that we see again.

KING: This argument on light will continue for thousands of years and keep our scientists puzzled,—who knows how long?

FORM: Hark, here comes Archimedes.

ARCHIMEDES: (*rushing on stage, dishabile, carrying jar of water, with King's crown immersed*) Eureka, I have found it!

KING: Found what?

ARCHIMEDES: See! Your new crown, sir; it is not pure gold! I weighed it in air, and I weighed it in water. Dividing its weight by its volume, thus I found, its density. Comparing this with a known volume of pure gold, I detected the difference.

KING: Ah! Bring me that deceitful goldsmith. Tell my soldiers to put him in chains and throw him into the slaves' dungeon.

FORM and NUMBER: Aye, aye, your majesty.

(*Enter Ptolemy and Copernicus, talking, followed by Kepler.*)

ARISTOTLE: Ah, Copernicus, believe me well: for all things there is an

absolute up and absolute down. Up is the natural place for light things and down the natural place for heavy things.

COPERNICUS: No, no, Aristotle! there is no absolute up nor down, but only an up and down for each planet. Weight, or gravity, is a natural tendency which causes all matter to come together in the form of spheres. What say you, Ptolemy?

PTOLEMY: I have devised a very complete and complicated solution for the entire heavens, which shows the planets moving in cycles and epicycles as the stars move westward in one great sphere.

COPERNICUS: No, Ptolemy, all the stars are fixed; but the planets revolve about the Sun, the earth along with the rest.

PTOLEMY: Dear Copernicus, it is impossible! A moving earth would fly to pieces, throwing off all manner of loose things, and hence destroy itself.

COPERNICUS: But Ptolemy, a moving sky, as you propose, would do so even more, since it is larger in circumference and if it revolves, would move faster. (*Turns to King.*) King Mathematics, you love simplicity; so, what could be simpler and more harmonious than my theory. It has no complicated cycles and epicycles in which the heavenly bodies would move, as my famous predecessor Ptolemy claims.

(*Enter aside, Martin Luther, John Calvin, Cardinal Baronius.*)

KING: It is indeed simple and regular. What say you Martin Luther?

LUTHER: This is revolutionary; and yet the Bible states that Joshua made the sun stand still, and not the earth. What do you say, John Calvin?

CALVIN: The 93rd Psalm says "The world also is established, that it cannot be moved." So who will venture to place the authority of Copernicus above that of the Holy Bible?

CARDINAL BARONIUS: "The Bible was intended to teach us how to go to Heaven, not how the heavens go."

KING: The entire universe is now understood to be one great mathematical system. What say you, John Kepler?

KEPLER: I have computed mathematically that the planets travel in paths which are ellipses, with the Sun at one focus. I have attested it as true in my deepest soul, and I contemplate its beauty with incredible and ravishing delight. God has created the world in accordance with the principle of perfect number so that the underlying harmony, the music of the spheres, is the real cause of the motion of planets. The sun may be likened to God The Father, the sphere of the fixed stars to God the Son, and the intervening ether through which the Sun impels the planets to God the Holy Ghost!

KING: Excellent! Who cometh here?

(*Enter Pascal and Milton.*)

NUMBER: Blaise Pascal and John Milton.

KING: Ah, Welcome! To both of you we are much indebted. What have you there?

PASCAL: Sir, the first adding machine.

KING: Ah, you have started something. I predict a great future for computing machines. (*pause*) Oh, by the way, have you heard from my friend, Galileo?

MILTON: I have just visited him in Italy, he sends his regrets that he cannot pay you homage in person. He has been imprisoned and will probably remain there for a long time. Though not permitted to publish his own book, it was published for him by friends in Holland. I bring you here a copy. (*Hands it to King.*)

KING: Ah "Dialogues on Two New Sciences."

MILTON: Yes, it tells of his remarkable discoveries, which, however, are quite unpopular in Italy. He had been so bold as to say that the *earth revolves about the sun*.

PASCAL: No human decree will prove the earth remains at rest; and if we have constant observations to prove that it does turn, not all the people in the world could stop it, nor could they stop themselves from turning with it.

MILTON: Galileo also invented a thermometer, by which we may determine the temperature at any time or place.

TRUTH: I hear also of a telescope he has made to view the distant heavens, and that it magnifies an object 30 times. With it he has viewed the Milky Way and finds it to be composed of innumerable stars. And, what do you suppose? He says that the Moon's face is not flat and smooth at all. It is covered with many mountains and valleys!

KING: (*as scientists, below, cross stage*) Ah, I am encouraged. My subjects are learning to use my implements. I predict swift progress in the exploration of all areas of my Kingdom in the near future. My power and influence will become enormously great.

(*If Part II is not used, the play should now conclude with the finale, beginning with asterisk(\*\*), near end of Part II.*)

## PART II

*Descartes and Fermat: Cross stage, deposit gifts, and pass on.*

DESCRATES and FERMAT: (*dramatically*) We come to prepare the way for Isaac Newton!

(*Enter Sir Isaac Newton, Kepler, Leibnitz, Cavendish, Halley, at other side of stage.*)

KING: Ah, Sir Isaac Newton!

NEWTON: (*bowing*) Learned King, I have worshipped you since my first days at Cambridge.

KING: My friend Voltaire has written to me about you.

KEPLER: Your majesty—Sir Isaac Newton has converted me from astrology. He has shown me the difference between mass and weight which have bothered me many years.

NEWTON: Majesty, by the aid of your tools, and the contemplation of my most thoughtful moments,—I bring you,—this book—“Principia.” (*Bowing and presenting it.*)

KING: Ah, “Principia Mathematicae Philosophiae.” Lagrange has told me “Principia is the greatest production of the human mind; for there is but one universe, and it can happen to but one man in the world’s history to be the interpreter of its laws.”

NEWTON: If I have been able to see farther than other men it is only because I have stood on the shoulders of giants,—giants who have preceded me. Experiment is the mother of certainty. As a boy, I watched an apple fall and determined then to find out why it fell.

FORM: Herr Leibnitz wishes to speak. (*Signals for him to speak.*)

LEIBNITZ: Sir Isaac Newton has no explanation for his Law of Gravitation. (*Is hushed; causes flurry.*)

KING: (*clears throat*) Sir Isaac, can you explain the underlying causes of Gravitation and your Laws of Motion?

NEWTON: No, your majesty, I only aim to report the truth through accurate observation, though the causes remain obscure. God alone holds the key to many secrets.

CAVENDISH: Your majesty, I measured his gravitation constant by two balls suspended on a torsion pendulum, and found it to be correct.

FORM: What about Halley’s comet?

KING: What say you Edmund Halley, for whom that bright comet is named?

HALLEY: Every 76 years my comet returns exactly in accord with Newton’s Law of Gravitation.

NEWTON: Also, my equations show where will be the moon among the stars at any time of night or day.

TRUTH: Sir Isaac, you are just wonderful!

NEWTON: I am only as a boy picking up pebbles on the vast seashore of knowledge.

KING: What have you there, a mirror?

NEWTON: (*reflecting light with mirror*) Aye, light travels in straight lines and is thus reflected from a surface. It travels in waves through a substance called ether which fills all space.

The most beautiful system of the Sun and Planets could only proceed from the counsel of an intelligent and powerful being; God endures forever and is everywhere present; and, by existing always and everywhere, he constitutes duration and space.



*Scientists following Newton, with their gifts, pass through, one by one, announced, by Number; each presenting an appropriate gift:*

HUYGENS:	<i>Cycloid Model</i>
MOSELEY:	<i>Periodic Table of Chemical Elements</i>
PASTEUR:	<i>Sterilization</i>
MME. CURIE:	<i>Radium</i>
MENDEL:	<i>Laws of Heredity</i>
JOHN DEWEY:	<i>Educational Philosophy</i>
DARWIN:	<i>Origin of Species</i>
FRAULEIN MEITNER:	<i>Atomic Fission</i>
LEONARDO DE VINCI:	<i>The lever</i>

*(Einstein enters and approaches King.)*

EINSTEIN: My noble king, I can use your own implements to show you are wrong in accepting Isaac Newton as your idol. He is wrong when he says there is an ether which brings us our light and through which all matter moves; for if so we would be moving eastward through the ether stream at all times and light would travel north and south faster than it does east and west.

TRUTH: Why is that, Father?

KING: Loved one, my formulas show that an object moving in a stream, such as a swimmer in a river, swims faster across the river and back again than he does an equal distance down the river and back.

TRUTH: Unbelievable, father, but you are never wrong.

EINSTEIN: And yet, sir, the velocity of light I know is constant.

KING: If we are not drifting through the ether, let us have proof of it, I want it verified. Bring to me my good physicists—Michelson and Morley. *(They appear.)* I say—find out if the speed of light is the same in a north and south direction as it is east and west.

M&M: Very good, sir—*(aside stage they adjust beam of light on mirror in N-S & E-W directions).*

EINSTEIN: Furthermore, sir, my friend Kauffman has weighed small Beta particles shot off by exploding radioactive atoms by watching their deflection in an electro-magnetic field. He finds they agree with my Relativity Theory and not with Newton's theory of gravitation. The increase in their mass is what I predicted for any object moving at high speed. Think of a bullet moving at high speed: It gets heavier as it goes faster and if it were to go with the speed of light its weight would be infinitely great. No object can move faster than light, but even if it went 150,000 miles per second it would double its weight.

*(Light Flash & Sound)*

KING: Unbelievable!

EINSTEIN: And, also, it would be only one-half as long while traveling at that speed.

KING: Astounding!

TRUTH: Sire, has he checked his answers?

KING: He is probably the only living man who can. Yes, they are my formulas and they are right.

EINSTEIN: Length, time, and mass are not absolute quantities; they vary according to the relative motion of the observer. They are only mental ideas.

M&M: Sir, Einstein is right, the speed of light is constant; both east and west, and north and south.

EINSTEIN: Moreover, there is no such thing as gravitation pulling objects toward the earth. Things do not fall, they merely trace their natural mathematical curve in a curved region of space-time.

KING: It is not necessary to verify mathematics experimentally, but for those of you who must see and feel in order to know, let me suggest this: My Nautical Almanac here says that in two minutes there will be an eclipse of the sun. As you have faith in your king, you know that his predictions never fail. At the precise moment that I have predicted, we shall be in darkness. My Royal Astronomer, Professor Eddington, will now prepare to view the edge of the sun's disc. There he will see a star, appearing to be displaced, due to its light coming to us, passing so near the sun,—being deflected by the presence of the sun. (Eddington adjusts telescope. Darkness begins.) According to Newton, the deflection should be an arc of 0.87 second; (Complete darkness.) I have checked over Einstein's equations and find no error in them. I predict the star's position will agree with Einstein's calculation of 1.74 seconds of arc. (*Pause.*)

What say you now, Royal Astronomer?

EDDINGTON: Your honor, it is 1.74 seconds.

KING: Good, good, my worthy subject. Albert Einstein at first you were thought to be a rebel, a heretic, a disbeliever of Euclid and Newton. Now you are known to be an evangel of truth, my best interpreter and explorer of the innermost depths of our Kingdom of knowledge. Albert Einstein, I commend you and accept your Theory of Relativity as a worthy application of my tools and processes. You have had abiding faith in me, no matter how astounding the results achieved. You are an honor to my cause.

EINSTEIN: Also, your majesty, I have recently discovered by your equations that *all* energy,—electrical, magnetic, and gravitational, are related in accordance with one general mathematical law.

KING: I see I have been too hasty in yielding the guardianship of my beloved Truth. To no one person alone does Truth belong. As my friend William Shakespeare once said, "All men naturally have

some love of Truth." She will remain as my guiding light. I will work constantly toward making her rule supreme. Truth must be known to all. (*Soft music begins and entire cast assembles gradually for finale.*)

You Scientists have travelled far in search of Truth. You have shown by your efforts that you are worthy of my best assistance. The resources of my kingdom are at your disposal. Use them well.

I place into your hands equations, formulas, diagrams, curves, and functions. Adapt them to your needs. I have looked well to the future in providing you many tools. Some of them are as yet unused. They are for you, now and forever.

It appears that God has builded nature along purely mathematical lines, and has made the human mind such that it might discover a few of her secrets, only after strenuous mathematical study.

Each of you has helped in moulding a true model of nature as you see it. Do not think that this man-made model of nature is reality, but instead that reality lies beneath it. Use my processes and implements; continue remodeling, and perfecting your knowledge. By perfection alone will you attain Truth.

Throughout this universe there is but one universal language, and that is mine. My language is known wherever men gather and wherever men think. It says more in fewer words than any language known. It is my language and it is the language of Truth.

(*Music tempo quickens.*)

TRUTH: "Aye, father, It will always be the language of Truth! Seek ye the Truth, and (the) Truth shall make you free. Learn ye well the language of my father and ye shall inherit his kingdom—the Kingdom of Knowledge.

(*Music, crescendo.*)

VOICES: May Truth Forever prevail!

Long live the King!

Hail! Hail! Hail!

CURTAIN

#### A NEW FILM ON POND LIFE

Plant and animal life found in an ordinary pond and the dependence of these living things upon one another to maintain a balanced life in their environment is illustrated in a new one reel science educational motion picture POND LIFE, released by Encyclopaedia Britannica Films.

By revealing the daily activities of the inhabitants of the pool, POND LIFE serves both as a nature study lesson, identifying certain animals and plants, and as an illustration of the perpetual cycle of life which is a result of the ecological pattern existing in the organized pond community.