**Plato**

Born: 427 BC in Athens, Greece

Died: 347 BC in Athens, Greece

Before giving details of Plato's life we will take a few moments to discuss how definite the details are which we give below. The details are mostly given by Plato himself in letters which seem, on the face of it, to make them certain. However, it is disputed whether Plato did indeed write the letters so there are three possible interpretations. Firstly that Plato wrote the letters and therefore the details are accurate. Secondly that although not written by Plato, the letters were written by someone who knew him or at least had access to accurate information on his life. The third possibility, which unfortunately cannot be ruled out, is that they were written by someone as pure fiction.

Next we should comment on the name 'Plato'. In Rowe writes:-

It was claimed that Plato's real name was Aristocles, and that 'Plato' was a nickname (roughly 'the broad') derived either from the width of his shoulders, the results of training for wrestling, or from the breadth of his style, or from the size of his forehead.

Plato was the youngest son of Ariston and Perictione who both came from famous wealthy families who had lived in Athens for generations. While Plato was a young man his father died and his mother remarried, her second husband being Pyrilampes. It was mostly in Pyrilampes' house that Plato was brought up. Aristotle writes that when Plato was a young man he studied under Cratylus who was a student of Heracleitus, famed for his cosmology which is based on fire being the basic material of the universe. It almost certain that Plato became friends with Socrates when he was young, for Plato's mother's brother Charmides was a close friend of Socrates.

The Peloponnesian War was fought between Athens and Sparta between 431 BC and 404 BC. Plato was in military service from 409 BC to 404 BC but at this time he wanted a political career rather than a military one. At the end of the war he joined the oligarchy of the Thirty Tyrants in Athens set up in 404 BC, one of whose leaders being his mother's brother Charmides, but their violent acts meant that Plato quickly left.

In 403 BC there was a restoration of democracy at Athens and Plato had great hopes that he would be able to enter politics again. However, the excesses of Athenian political life seem to have persuaded him to give up political ambitions. In particular, the execution of Socrates in 399 BC had a profound effect on him and he decided that he would have nothing further to do with politics in Athens.

Plato left Athens after Socrates had been executed and travelled in Egypt, Sicily and Italy. In Egypt he learnt of a water clock and later introduced it into Greece. In Italy he learned of the work of Pythagoras and came to appreciate the value of mathematics. This was an event of great importance since from the ideas Plato gained from the disciples of Pythagoras, he formed his idea:-

... that the reality which scientific thought is seeking must be expressible in mathematical terms, mathematics being the most precise and definite kind of thinking of which we are capable. The significance of this idea for the development of science from the first beginnings to the present day has been immense.

Again there was a period of war and again Plato entered military service. It was claimed by later writers on Plato's life that he was decorated for bravery in battle during this period of his life. It is also thought that he began to write his dialogues at this time.

On his return to Athens Plato founded, in about 387 BC, on land which had belonged to Academos, a school of learning which being situated in the grove of Academos was called the Academy. Plato presided over his Academy in Athens, an institution devoted to research and instruction in philosophy and the sciences, from 387 BC until his death. His reasons for setting up the Academy were connected with his earlier ventures into politics. He had been bitterly disappointed with the standards displayed by those in public office and he hoped to train, in his Academy, young men who would become statesmen. However, having given them the values that Plato believed in, Plato thought that these men would be able to improve the political leadership of the cities of Greece.

Only two further episodes in Plato's life are recorded. He went to Syracuse in 367 BC following the death of Dionysius I who had ruled the city. Dion, the brother-in-law of Dionysius I, persuaded Plato to come to Syracuse to tutor Dionysius II, the new ruler. Plato did not expect the plan to succeed but because both Dion and Archytas of Tarentum believed in the plan then Plato agreed. Their plan was that if Dionysius II was trained in science and philosophy he would be able to prevent Carthage invading Sicily. However, Dionysius II was jealous of Dion who he forced out of Syracuse and the plan, as Plato had expected, fell apart.

Plato returned to Athens, but visited Syracuse again in 361 BC hoping to be able to bring the rivals together. He remained in Syracuse for part of 360 BC but did not achieve a political solution to the rivalry. Dion attacked Syracuse in a coup in 357, gained control, but was murdered in 354.

Field writes in that Plato's life:-

... makes it clear that the popular conception of Plato as an aloof unworldly scholar, spinning theories in his study remote from practical life, is singularly wide of the mark. On the contrary, he was a man of the world, an experienced soldier, widely travelled, with close contacts with many of the leading men of affairs, both in his own city and elsewhere.

Plato's main contributions are in philosophy, mathematics and science. However, it is not as easy as one might expect to discover Plato's philosophical views. The reason for this is that Plato wrote no systematic treatise giving his views, rather he wrote a number of dialogues (about 30) which are written in the form of conversations. Firstly we should comment on what superb pieces of literature these dialogues are:-

They show the mastery of language, the power of indicating character, the sense of a situation, and the keen eye for both its tragic and its comic aspects, which set Plato among the greatest writers of the world. He uses these gifts to the full in inculcating the lessons he wants to teach.

In letters written by Plato he makes it clear that he understands that it will be difficult to work out his philosophical theory from the dialogues but he claims that the reader will only understand it after long thought, discussion and questioning. The dialogues do not contain Plato as a character so he does not declare that anything asserted in them are his own views. The characters are historic with Socrates usually the protagonist so it is not clear how much these characters express views with which they themselves would have put forward. It is thought that, at least in the early dialogues, the character of Socrates expresses views that Socrates actually held.

Through these dialogues, Plato contributed to the theory of art, in particular dance, music, poetry, architecture, and drama. He discussed a whole range of philosophical topics including ethics, metaphysics where topics such as immortality, man, mind, and Realism are discussed.

He discussed the philosophy of mathematics, political philosophy where topics such as censorship are discussed, and religious philosophy where topics such as atheism, dualism and pantheism are considered. In discussing epistemology he looked at ideas such as a priori knowledge and Rationalism. In his theory of Forms, Plato rejected the changeable, deceptive world that we are aware of through our senses proposing instead his world of ideas which were constant and true.

Let us illustrate Plato's theory of Forms with one of his mathematical examples. Plato considers mathematical objects as perfect forms. For example a line is an object having length but no breadth. No matter how thin we make a line in the world of our senses, it will not be this perfect mathematical form, for it will always have breadth. In the Phaedo Plato talks of objects in the real world trying to be like their perfect forms. By this he is thinking of thinner and thinner lines which are tending in the limit to the mathematical concept of a line but, of course, never reaching it. Another example from the Phaedo is given in:-

The instance taken there is the mathemtical relation of equality, and the contrast is drawn between the absolute equality we think of in mathematics and the rough, approximate equality which is what we have to be content with in dealing with objects with our senses.

Again in the Republic Plato talks of geometrical diagrams as imperfect imitations of the perfect mathematical objects which they represent.

Plato's contributions to the theories of education are shown by the way that he ran the Academy and his idea of what constitutes an educated person. He also contributed to logic and legal philosophy, including rhetoric.

Although Plato made no important mathematical discoveries himself, his belief that mathematics provides the finest training for the mind was extremely important in the development of the subject. Over the door of the Academy was written:-

Let no one unversed in geometry enter here.

Plato concentrated on the idea of 'proof' and insisted on accurate definitions and clear hypotheses. This laid the foundations for Euclid's systematic approach to mathematics. In [2] his contributions to mathematics through his students are summarised:-

All of the most important mathematical work of the 4th century was done by friends or pupils of Plato. The first students of conic sections, and possibly Theaetetus, the creator of solid geometry, were members of the Academy. Eudoxus of Cnidus - author of the doctrine of proportion expounded in Euclid's "Elements", inventor of the method of finding the areas and volumes of curvilinear figures by exhaustion, and propounder of the astronomical scheme of concentric spheres adopted and altered by Aristotle - removed his school from Cyzicus to Athens for the purpose of cooperating with Plato; and during one of Plato's absences he seems to have acted as the head of the Academy. Archytas, the inventor of mechanical science, was a friend and correspondent of Plato.

In mathematics Plato's name is attached to the Platonic solids. In the Timaeus there is a mathematical construction of the elements (earth, fire, air, and water), in which the cube, tetrahedron, octahedron, and icosahedron are given as the shapes of the atoms of earth, fire, air, and water. The fifth Platonic solid, the dodecahedron, is Plato's model for the whole universe.

Plato's beliefs as regards the universe were that the stars, planets, Sun and Moon move round the Earth in crystalline spheres. The sphere of the Moon was closest to the Earth, then the sphere of the Sun, then Mercury, Venus, Mars, Jupiter, Saturn and furthest away was the sphere of the stars. He believed that the Moon shines by reflected sunlight.

Perhaps the best overview of Plato's views can be gained from examining what he thought that a proper course of education should consist. Here is his course of study:-

... the exact sciences - arithmetic, plane and solid geometry, astronomy, and harmonics - would first be studied for ten years to familiarise the mind with relations that can only be apprehended by thought. Five years would then be given to the still severer study of ' dialectic'. Dialectic is the art of conversation, of question and answer; and according to Plato, dialectical skill is the ability to pose and answer questions about the essences of things. The dialectician replaces hypotheses with secure knowledge, and his aim is to ground all science, all knowledge, on some 'unhypothetical first principle'.

Plato's Academy flourished until 529 AD when it was closed down by the Christian Emperor Justinian who claimed it was a pagan establishment. Having survived for 900 years it is the longest surviving university known.

J J O'Connor and E F Robertson