

## The Philosophy of Mathematics – Paper I

Seeing that Mathematics has taken centre stage in Modern Physics and has always been my best subject, and seeing as I spend most of my time opposing the stance that mathematicians take in their attitude to Reality, I think the time is long overdue for a clarification of what this subject is all about.

Any attempt such as this is made difficult because of the fact that Mathematics has changed several times during its history of conscious development by Mankind. And these changes were NOT trivial as I will proceed to explain.

Mathematics started as methods for using measurement. Methods were discovered to aid in the manipulation of number in both accounting and calculation. Indeed, it is often put forward that the first writing was ONLY for such purposes, and that what we now consider to be its main purpose - to communicate memories, stories and ideas, came some time later. But, though the initial “arithmetic” was only a series of useful tricks, they did hint at a greater region of Truth, behind all such everyday techniques. Indeed, even the concept of number is an abstraction, which soon proved to be entirely independent of the things being counted.

From the start, measuring the length of a tree, a stone slab, or a piece of cloth were all amenable to a single universal set of processes. Measurement was soon seen as being independent of what was being measured. Also, the idea itself was developed to take in areas and volumes, and soon posed problems concerned with circles, cylinders and other forms.

The Greeks took these universal features as idealised, abstract entities, and constructed Geometry, and this was developed to a remarkable degree, considering when it was done. In combination with Formal Logic, they developed the methods of Theorems and Proofs, and Mathematics was made the most sophisticated of all the ancient sciences. The most remarkable thing about Greek Geometry was its conscious abstraction. All its lines were of zero thickness, its circles perfectly round, its planes perfectly flat and of infinite extent - all of which are impossible to achieve in Reality. Nonetheless, the method was devastatingly powerful.

Why was this?

In effect the Greeks had invented conscious abstraction. They knew that they were idealising these basic assumptions, but they also knew that in so doing, they were “clearing the decks” All non essential trivia had to be removed to reveal the essential relations, so that these could be studied “in splendid isolation”. Now, it is easy to posit upon our intellectual ancestors our own present day concepts, and it is certain that the Greeks didn’t fully comprehend the full import of what they were doing. BUT, they were not speculating into the void. Their invention was soundly based, and what it revealed was what they hoped it would – an “ideal” world which “underlay” many of the regularities found in Reality.

They even invented Drawing, or more accurately Diagrams, which perform very similar functions, and with which problems can be both clearly expressed and even solved. To study the circle, you don’t draw it as a slice through a tree trunk, and carefully add its growth rings and its bark. You don’t even satisfy yourself with a crudely drawn version. You attempt to draw a “perfect” circle – the “essence” of a circle, for you NEED to conceive of it as perfect, in order to concentrate on, and extract, its very essence.

These methods were an extrapolation of what Man had been doing for millennia in order to survive. He had learned, early on, to train himself to extract the essential Form of any situation, and use that for further perusal and development. The process involved extraction and isolation of formal elements, and the subsequent processes were to establish the significance of the elements in a whole “penumbra” of consequences. Such an approach was superlative and correctly gained a tremendous authority for Greek achievements and Thought.

Now, right from the start, Mathematics had two sides.

Its usefulness was beyond doubt, and its approach was certainly revolutionary. BUT, the tail soon began to wag the dog. The most able of mathematicians – the Pythagoreans – soon elevated Mathematics, and in particular Number, to almost supernatural status. The “hidden essence” in everything was assumed to be mathematical, and many a cul de sac was thoroughly investigated to reveal the Essence of the World. NOT,

you will notice, the essence of Form, but something much more significant. And this dichotomy has prevailed – the pragmatic use versus the “driving essence”!

So, when talking about the Philosophy of Mathematics, you are confronted with explaining both arms of this dichotomy - **the objective content of Forms** on the one hand, and **their seeming determining essence** on the other.

There is without any doubt an important pragmatic side to Mathematics which is still vital to this day, which is still NOT the same as the intellectual studies of the theorists. Since the building of the Pyramids, we have evidence of various “tricks of the trade”, which were extremely useful methods in the carrying out of everyday tasks. The practitioners did not have to know why, or be able to construct an extended set of consequences for their “tricks”. NO, they just had to know how to do them.

Mathematics was a toolbox of useful ways of getting exactly what they needed to complete a given task. The knowledge of such tricks was the tradesman’s “capital” and he would guard his knowledge carefully, and only divulge it to his chosen “apprentices”.

Now, there was a carry over from detailed intellectual investigations to the day-to-day tasks of the illiterate workmen, but it was NOT extensive at that time.

So, let us make a synopsis of what we have dealt with so far.

Remember, we are still in ancient times, long before the major flowering of Mathematics, but far enough along for the main strands to be identifiable. We have, at the heart of all strands, the process of Abstraction of universal forms. These were undoubtedly useful and became the mathematical toolbox of practical workers – skilled tradesmen. This strand also took in an administrative and design layer above the workers, who solved problems and directed their workers to implement the solutions. This then was the Technology Strand of Mathematics.

On the other hand, Mathematics became an essential ingredient in the study and thinking of intellectuals, who were thinkers, philosophers and teachers. These people took a much less practical line, and did not solve everyday practical problems, but consciously concerned themselves with the implications of mathematical method.

It was they who invented Geometry and Logic, and within their ranks were represented the all the main strains in Modern Philosophy. It is not for trivial reasons that we associate Plato with Idealism and Democritus with Materialism, and see representative of the many strains in between even at the birth of Philosophy.

**To be continued**

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