

The Philosophy of Mathematics – Paper IV

Historical Note: Now, after this partial look at the area of imaginary Mathematics, let us look back on it with the view that the participators had historically.

All this “interpretation” which I have inserted to explain the significance of the “square root of -1” was NOT the content of the original work.

It really was seen as an extension of Mathematics based upon integrating the “number” i into previously existing content seamlessly. The fact that you could not have a square root of -1 did not deter, but only impelled our mathematicians to complete this extension. If anything their driving force was their belief that Mathematics could not possibly be littered with innumerable “dead-ends, for many other solutions to equations gave results which could be manipulated to be expressed antirely in terms of normal numbers and i .

It was almost a Pythagorean impulse that made them carry it through, until i simply added a few extra rules to the monolithic fabric of mathematical manipulations. Finally then, their objective of seamlessly fitting it into Mathematics had been achieved, and the fact that it seemed to have NO use was not as importance as that it “fitted” into the “essence” of Reality so well. For this to have been achievable it simply “*Must mean something too*”.

Now such an approach not only became acceptable in mathematical circles, it ultimately became the crowning glory of the “science”, and the best mathematicians had truly broken “free” from its pragmatic beginnings. Though it didn’t know it at the time, it had promoted itself to the Study of Pure Form. Now, in so doing these mathematicians had established TWO opposing features of Mathematics.

FIRST – that it could explore new ground constantly

SECOND – that it was no longer an aspect of Reality.

Indeed, it had become a separate, but related World – what I have come to call **Ideality**. Elsewhere you can read exactly how I came to this realisation, and why I called it Ideality, but here the crucial point is that though Mathematics includes all pure forms, and weaves them together with great skill (and indeed art), the threshold had been passed. It had ceased to be what it was INSIDE Reality – the Handmaiden of the Sciences, and had become the Queen of the Sciences OUTSIDE of Reality. It was a parallel, purified, idealised realm of Form and Form alone, and this involved many dangers as well as advantages. For many years to come, its foraging into the impossible was to find Forms that could be applied to Reality, but as with ALL Mathematics, the “fitting” involved wholesale rejection and ejection of aspects of Reality, and these chickens would certainly come home to roost without a doubt.

Now I was always taught that this inclusion was merely an extension of the concept of Number into a wider area, but of course it was not really that, but a much more general category that was being established. In making operators a subset of Number, so that with a couple of extra rules, enabled the methods of Mathematics to be used in quite a different area. What was really happening was the extension of Algebra BEYOND Number into the symbolic representation and manipulation of this wider class of entities and processes. Now, though in retrospect we can give it this gloss, it must be emphasized that the motives of the mathematicians were not so far seeing. Indeed, they didn’t KNOW that it was an operator at the time. But, they did know that this extension transformed a difficult area into one that could be processed using standard mathematical techniques, and to equip “sum-doers” to deal reasonably well with more difficult areas.

If we are accurate, we have to admit that many areas outside of the original conception of Mathematics have been smuggled in to benefit from the amazingly powerful manipulative techniques that Mathematics had already amassed in its Toolkit.

But we have to ask the question, “Has there been only benefits by this method? Has the power of Mathematics been extended to cover other areas, and thus donate its wonders to them without loss?”

No, there is always a loss! It is the usual loss incurred with extraction/isolation/abstraction in that the “delivered” abstraction has at the end of the process been stripped from its real world content entirely and become yet more disembodied Form. Indeed, operators such as i have even lost any conscious idea that they are operators! They have become NUMBER!

Now this example of extension is interesting because the area was added and developed long before it was “attached” to any corresponding phenomena in Reality. The subsequent realisation that what it actually applied to was rotation, was a result of consulting the Toolbox of techniques for mathematical forms that would FIT onto real world rotations. The match was made, and the obvious questions as to why “imaginary mathematics” fitted rotation was asked, and only then did it become clear that i was in fact an OPERATOR. Now just as a great range of “numbers” could be reduced to normal numbers and i , so all rotations could be reduced to ordinary numbers PLUS “turn anticlockwise through 90° ”. So, the facilities offered by imaginary mathematics were generally applicable to all rotations.

And indeed, the large amount of effort that had also been put into oscillations (in particular Simple Harmonic Motion or Sine Waves) had revealed that circular motion (rotation) could be represented by two sine wave oscillations at right angles to one another in an appropriate synchronisation. Thus, this area of mathematics began to be the method of dealing with ALL of these areas.

[Note: For a full description of all this, a detailed study of the area must be sought out. Many such exist, but beware of “mathematical Text Books” – for they are always perfect examples of “not seeing the wood for the trees”, insisting ONLY on talking about techniques and not addressing anything deeper.]

Though the growing power of Mathematics has been extended to other areas, it has been at the expense of dealing with those new acquisitions ONLY by means of their FORM. Though powerful and useful, Mathematics when used ALONE is NOT really about Reality in all its richness, but instead is about a constructed world of Pure Form. You may disagree with the use of the word “constructed”. What about i ? Is not the conversion of “turn anticlockwise through 90° ” into a “funny” number i and its verbal definition as the “square root of -1 ”, and the new meaning of -1 as “turn anticlockwise through 180° ”, and the conversion of x (times) into the instruction “followed by” – constructions?

Of course they are! But, I am not saying that these are “cheating” or “mistakes” or “pure arbitrary invention”. I know the way that Mankind is forced to deal with Reality. He has to divide Reality into Parts (Pluralism), and he has to abstract from Reality, and he has to manipulate his inventions as a step towards understanding. I KNOW that he has to do this, but it is not a method without consequences.

It allows progress, but also greatly hinders progress when the chickens come home to roost.

From Zeno onwards these methods have been demonstrated to be “frigs” – assumptions to allow of some progress. But, the recurring lesson for at least 2,500 years has been that we must learn to recognise our simplifications and our assumptions for what they are, or we will pay for our self kid!

(1,255 words)