Mathematics and Religion: Similar Solitudes?

Leo Jonker

"It consists of nothing but rules and doctrines, and it is totally irrelevant to my life". For many people this would be their experience of organized religion. However, it is also how many would characterize mathematics. The language might be a little different in the case of mathematics, more like "nothing but arbitrary rules and procedures," but the perceptions are similar.

In my extensive contact with undergraduate students intending to be elementary school teachers I find three types of reaction to their past experience of mathematics, two of which lead to a misreading of the subject: Many dislike and fear mathematics because they feel that at some point in their study they were unable to understand the reasons behind the rules imposed on them by their teachers, and were not given helpful answers when they asked for them. These students deserve credit for not consenting to answers that do not connect to their prior understanding. Another group of incoming students profess to enjoy mathematics, "but not proofs". These students view mathematics as a set of procedures that, when practiced accurately, leads to answers that are clear. "I like mathematics because the solutions are either right or wrong – there is no grey area". Both of these views correspond to similar reactions to a religious upbringing: Some reject it because they feel they were asked to assent to doctrines that made no sense – that were not rooted in their experience; others welcome rules because they like their lives to be ordered by a clear demarcation between black and white.

But these are not the only ways to experience mathematics or religion. For mathematics and religion both, the truest profession is profession that is grounded in positive experience and embodied in committed practice. Fortunately, for a certain percentage of university students their high school mathematics experience has been one in which their understanding of mathematics flourished and grew deep roots. Perhaps it happened because they consistently had good teachers who understood students' difficulties, who knew ways to connect theory to practice, and who gave time for those connections to grow. These are the students whose teachers did not shut down opportunities to explore mathematical structure by imposing rules that made no sense to the student, or perhaps even to the teacher. For other students the connections and patterns of mathematics appealed to them so strongly and absorbed them so completely that from an early age they were able to build on their understanding even with a poor teacher. For these students, theorems have content and formulas have a history. For them the rules and formulas, the theorems and procedures, do not look like the hard outer surface of a frightful machine, but rather like the outward appearance, or the skin (Gerhart & Russell, 2001), of a pulsating organism. These students know what it is to participate in the life of the subject.

This approach is found especially in the mathematical community that produces journal papers and mathematics text books to codify and organize their mathematical discoveries. They write the skin, but they know the life it holds. Even a seasoned research mathematician, when reading an important paper for the first time will be reading it to find out "what is really going on here", looking for the meaning beneath the surface. Whether the skin repels non-mathematicians entirely depends on the extent to which the stewards of the discipline are sensitive to the way many people react to it, and whether they understand the origins of those reactions.

Religion, too, can present a formal, and sometimes cold and incomprehensible surface to the world. As in mathematics, however, this belies the fact that under this surface many participate in genuine and meaningful religious activity. Those who have not been exposed to religion as experience, who have been shown only codifications whose existential meaning has been lost along the way, or who have not thought it worth their while to take the time to look more closely, will see only a desiccated carapace, a shell in which there is no life. For religion as for mathematics, codification is necessary as a way to communicate shared experience and to test the validity of that experience through formal expression. But, as in mathematics, this expression should not be allowed to become impervious to insight, and it should never be imagined that in mathematics or in religion formal expression is all there is.

Under the skin, both are areas of human activity that involve joys and disappointments, pride and humility, mistakes and successes, friendships and friction. The activities differ in the range of their foci. Mathematics explores the ubiquitous and ever varying manifestations of numeric and geometric structure, and plays with the mind's ability to construct consistent edifices of ever higher abstract forms. Religion explores the scope and the limits of human life, its beginning and its end and the meaning that holds these together, the relationships to others, the encounter with God. For mathematical activity as much as for religious activity, at heart it is not the codification that matters most. It is not what drives us - not what attracts and keeps us engaged from day to day.

What matters most in the end is that we are particular human beings who interact for a time with other particular human beings and with particular objects in the world around us. We speak to them and they join the conversation (Zuidervaart 2011). We push against them and they push back, and in this back and forth we discern the contours of what is true – not just by personal or social construction, but by encounter. This encounter is the arena for after-the-fact recognition of what is fitting and therefore beautiful (Dewey 1934). This is where we meet surprise and delight. This is where beauty resides: beauty inhabits the distance between people and between subject and object; it is the true nature of that distance (Hart 2003), never bridged by closure or conceptual reduction, always an invitation for new delight. This is where, in mathematics and in religion, our activity is ultimately spiritual; and where all we encounter is creation.

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Leo Jonker is professor of mathematics at Queen's University. He has long been interested in elementary mathematics education and teaches a mathematics course for undergraduates who hope to become elementary school teachers. He can be reached at leo@mast.queensu.ca .