Editorial

This year marks the hundredth anniversary of Freud's first written reference to "the unconscious" (*das Unbewusste*) in what was to be its psychoanalytic sense.[1] It therefore seems particularly appropriate that this special issue devoted to some affective aspects of mathematics education contains a number of articles that refer to psychoanalytical notions.

It is perhaps surprising that the rapidly growing discipline of mathematics education has not hitherto paid much attention to psychoanalysis, though there have been, for example, some relevant articles published in this journal.[2] The relative neglect in general may be due to the emphasis in Piagetian psychology on cognitive development. But the continuing evidence that so many people can be said to be traumatised by their experience of mathematics suggests that a consideration of affective issues is long overdue. The basic question in mathematics education is still the one asked by Henri Poincaré: "how does it happen that there are people who do not understand mathematics?"[3] That this question can be usefully considered in terms of emotional development is a common underlying assumption of many of the articles in this special issue. This is, of course, not to deny that there are other factors involved when people fail at mathematics.

Poincaré certainly invoked the unconscious in his account of mathematical creativity; but this involved a smooth problem-solving process very different from the emotionally charged psychoanalytic version. In his article (p39), Ross Skelton shows how Poincaré's account was interpreted by the psychoanalyst, Wilfrid Bion, in terms of the theories of Melanie Klein. Mathematical creativity is here seen to involve a more chaotic aspect - a return to the so-called "paranoid-schizoid position" - and this is captured by the image of Shiva, the destroyer/creator, on the front cover.

Another analyst whose work seems relevant to mathematics education is Jaques Lacan. Sherry Turkle has suggested how this might be so: "For Lacan, mathematics is not disembodied knowledge. It is constantly in touch with its roots in the unconscious." In the first place, this confirms the view that mathematical creativity draws on the unconscious. But Turkle goes on to suggest, more intriguingly, that "mathematics may be like dreaming, in the sense that it may reveal things that are normally hidden."[4]

Lacan's work has been increasingly invoked by various writers in recent years, notably by Valerie Walkerdine in her powerful critique of mathematics education. In particular, the Lacanian transition from the so-called Imaginary order to the Symbolic order is seen to be an extremely problematic aspect of learning mathematics. According to Walkerdine, mathematics involves a fantasy of omnipotent power, of a mastery of desire:

> The learner of mathematics is not caught in the play of desire in the Imaginary, but believes himself to have control of it... If desire is controlled it is not fulfilled, or satisfied. Its Other, therefore, the loss, the object desired, exists waiting in the wings, in the external reference suppressed in the discourse. The Other of mathematics is uncertainty, irrationality, [being] out of control, madness, and so on [5]

Some related semantic issues are raised by David Pimm in his moving meditation (p35) on various themes of loss triggered by a personal bereavement. In their Lacanian jeu d'esprit (p11), Tony Brown, Tansy Hardy, and Dave Wilson offer a lively condensed account of the relevance they have found in Lacan's work. And the pictures on pp28-9 illustrate a further aspect of these themes.

Many other analysts have been fascinated by mathematics and have invoked it specifically in their work. Freud observed that mathematics was often seen as a diversion from sexuality; he quoted the advice given to Rousseau by a dissatisfied lover: "Lascia le donne e studia la mathematica". Jung had some grim memories of mathematical lessons in his childhood: "I was so intimidated by my incomprehension that I did not dare to ask any questions. Mathematics classes became sheer terror and torture to me." Sandor Ferenczi, a close colleague and friend of Freud's, left some posthumously published notes on mathematics [6] which explore, in analytic terms, the distinction between implicit and explicit mathematics - a distinction which is of some importance in discussions of ethnomathematics.

More recently, Ignace Matte Blanco has given an account of unconscious process in terms of notions from Cantorian set theory. That the part may represent the whole in the unconscious - the breast *is* the mother - is related to the similar feature of infinite set theory, namely that a subset may be equivalent to the whole set. There is no order in the unconscious - that is to say that asymmetric relations will tend to be "symmetrised out" by the unconscious. This notion is deftly applied by Ian Mordant in his discussion of mathematical textbooks (p20).

Matte Blanco's work may be described as a mathematisation of the unconscious; conversely, a psychoanalysis of the mathematics may be found in the work of a Hungarian analyst, Imre Hermann, who discussed the work of various mathematicians, including Cantor.[7] Another sort of analysis of mathematics occurs in the work of Michel Serres who has given a stirring account of the origins of mathematics,

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linking the Oedipus myth - in its original and contemporary versions - with the Pythagorean discovery of irrationality. Serres' approach is unlike that of usual historians of mathematics in that he deliberately creates a mythopoeic account: "Let us not forget that Leibniz, proto-inventor of the new science, said in time and against his time that one should listen to old wives' tales". A brief review of some of this work — with a suggestion that it might be of particular interest and value to mathematics education — is given by David Wheeler (p53). Some connections between the psychoanalytic version of the Oedipus myth and the learning of mathematics are made by Derek Ball (p4).

Old wives' tales have "narrative truth": analysts are accustomed to the distinction between this and "historical truth" for, on the couch, it is not so much a matter of what happened historically to the patient, but rather of what he or she - or the analyst - has made of it. Similarly, in making any interpretation of classroom observations, the issue is not, of course, whether the accounts offered are "true" in some essentialist sense, but rather a matter of trying to extend the range of our observations and the narratives we construct. Robert Nicodemus illustrates this in his study (p24) of the ways in which one might look at and talk about video recordings of mathematical classrooms.

Classroom observations lead to interpretations of students' behaviours which may be symbolic as well as actual. Thus, Nicodemus suggests that some children may find thinking about parts - for example, in working with fractions - difficult because keeping things whole may have some emotional significance. This does not, of course, mean that such symbolism always needs to be interpreted. This has been particularly emphasised by Barbara Dockar-Drysdale, a therapist who has worked with severely disturbed children. According to her, symbolisation is necessary to internalise and preserve early experience; as one of her patients poignantly reports, "I need a box inside me to keep things in that have happened". But the restoration of the missing process may itself be symbolic. How this may happen is illustrated by Rosamund Sutherland who quotes Dockar-Drysdale in her account (p43) of how some children she worked with were able to overcome the inner fears that had previously inhibited their learning. Similar "victories" were described by a French teacher and therapist, Lusiane Weyl-Kailey, in a book that deserves to be more widely known - it is briefly reviewed in this issue (p47).

The way in which computers may offer a direct "concrete" experience of symbolisation is discussed by Sherry Turkle and Seymour Papert in an extract (p49) from a recently published article that raises some profoundly important questions about intellectual styles, in particular those that seem to be related to gender. These are linked with psychoanalytic accounts - based on so-called "object-relations theory" - of the very earliest experiences of childhood.

Early experiences may leave uncomfortable residues: we sometimes cope with these by invoking defence-mechanisms to deal with what may be psychically difficult or threatening - or unacceptable to our view of self ("ego-ideal"). Some classical examples of defences that may be called upon to deal with mathematics are discussed in the article (p30) by Jaques Nimier, who is a rare example of a mathematics education professor who has regularly invoked psychoanalytic insights in his work. The quotations from his interviews with students convincingly support the general account of defence-mechanisms that is offered.

One of the most powerful defence-mechanisms, one that we all employ in one form or another throughout our lives, is "splitting". We split the good and bad parts of ourselves, and project them onto people or things. In a similar way we may split the intellectual and emotional parts of ourselves, perhaps seeing one as good and the other as bad. It is clear that mathematics can occasion such splitting - and this may be true for people who are good at it, as well as the many who are not. It is emphasised by David Hawkins in his article (p15) that young children are more integrated in their approach to their learning. Moreover, he claims that mathematics itself was originally more integrated than its subsequent splitting between algebra and geometry might suggest.

That splitting may exact a public, political price, as well as a private, personal one, is emphasised by Chris Breen who reports (p6) on his work as a mathematics educator in the uncompromisingly difficult context of education in South Africa. Jungian ideas are invoked as part of his search for a way to be "between opposites". This can also be seen in Kleinian terms, as a transition to the "depressive position" in which good and bad are re-integrated. Breen's article reminds us that some of these psychoanalytic issues are literally matters of life and death, and that we have neglected the separation of feeling and thought in education for far too long. As Sherry Turkle has (elsewhere) emphasised, "we need not feel that we are faced with a choice between poetic warmth and the cold, dry fruits of the Pythagorean tree" [4]

Finally, I wish to acknowledge the patient and courteous way in which the contributors to this issue have co-operated in working to the predetermined guidelines I had imposed. In order to have as many contributions as possible, I severely restricted word-lengths; moreover, out of a private preference for shorter bibliographies, I proposed ruthless cuts in references. I am still alive to tell the tale - and grateful to the generous authors.

Dick Tahta

References

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[3] H. Poincaré, *Science and method* New York: Dover Books, (n.d.) p47

[4] S. Turkle, *Psychoanalytic politics*, London: Burnett, 1979, p237

[5] V. Walkerdine, *The mastery of reason*, London: Routledge, 1988

[6] S. Ferenczi, *Final contributions to the problems and methods of psychoanalysis*, London: Hogarth Press, 1955

[7] I. Hermann *Parallélismes*. Paris: Denöel. 1980