Editorial: Growth & Change

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2006 heralds the third year of *The Montana Mathematics Enthusiast*. The journal has undergone healthy mutations since its rebirth in April 2004. We now have in place since October 2005 an illustrious international editorial board and contributing editors with a very wide range of experience and expertise. The aims, scope and editorial information link on the journal website provides this information for the interested reader. The peer review process for papers submitted to the journal has also been smooth and timely, which has helped in attracting more submissions with quality control checks in place to maintain the scholarly status of the journal. *TMME* has also begun the process of acquiring indexing in well known research databases worldwide. The website statistics for *Vol2no2 (August 2005)* and *TMME* in general have been nothing short of staggering in terms of the places from which the journal was accessed. We have thus far been accessed from 91 different countries (!) and counting. A new statistical feature on the journal website allows readers to get a rolling glimpse of countries from which the journal is accessed based on the last 100 page loads. Sample statistics on journal access during the last five months is included at the end of this issue for the interested reader. The current issue: Volume 3, no1 is both wide in scope and dense with ideas, consisting of seven articles focused on topics within mathematics; mathematics and philosophy; mathematics education history; talent development and challenges for mathematically promising students. One underlying theme of many of the articles is ways in which mathematics can stimulate us, capture our imagination, and even excite us with its possibilities for teaching and learning from the elementary school level onto the professional levels. The geographic range of the authors attests to the benefits of open access for the wide dissemination of ideas without institutional and subscription restrictions.

The first paper by Joran Elias (Montana) provides an interesting application of Wu's method of proving geometric theorems algorithmically. The paper also serves as an accessible introduction to ideas from elementary algebraic geometry for those interested in this area of mathematics. Viktor Freiman (Canada) contributes a research based article based on a 7-year longitudinal study in K-6 classrooms in Eastern Canada on ways to boost mathematical talent in the early grades. The paper provides a glimpse at the sophisticated mathematical capacities of young children once a challenging situation captures their interest. Freiman also makes novel use of Krutetskii's findings on the mathematical abilities of school children and Guy Brousseau's theory of didactical situations to illustrate how his model of boosting mathematical talent works in the mixed-ability classroom setting. One question that has perplexed researchers is how and why natural mathematical talent gets stifled in the institutionalized school setting despite the best intentions of teachers and curricula. Some conjecture that this happens because of the non-recreational and non-realistic characteristic of mathematics in the school curriculum as a student progresses from kindergarten onto high school. The physicist, George Gamov (1904-1968), also took an interest in education as evidenced in his numerous writings accessible to "lay" persons. Gamov proposed the building blocks problem as a recreational problem to determine the center of gravity of blocks laid on top of another, staggered by a fixed number. The problem is intended to provoke mathematical thought and a solution not relying on any numerical formulas although solutions can involve the use of the harmonic series and the logarithmic function. Yutaka

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Nishiyama (Japan) writes that university students majoring in the sciences are unable to solve this problem although their Calculus background provides them with (context independent) knowledge of showing how harmonic series diverge. Nishiyama argues the need to provide context to mathematics if the goal is to get students at the tertiary level excited about mathematics. Steffen Iversen (Denmark) investigates authentic situations which allow for philosophical competencies to develop in the high school mathematics classroom, and presents a conceptual model for further developing interdisciplinary connections between mathematics and philosophy. Iversen's views are pragmatic in nature and warn us to be wary of implementing interdisciplinary reform prescribed by a governmental body (the Danish ministry of Education) without fully thinking of the didactical consequences, both positive and negative. The paper presents the results from a series of qualitative interviews of high school teachers on interdisciplinary activities which integrate mathematics and philosophy at the high school level. The paper presents a didactical model for integrating math and philosophy, which Steffen Iversen and Claus Michelsen are trying to expand to the sphere of physics and other subjects of natural sciences. The next three papers explore mathematics education history and talent development. Fulvia Furinghetti (Italy) sketches important elements of mathematics education history in Italy, starting with the contributions of influential mathematicians like Guiseppe Peano, Luigi Cremona, Federigo Enriques, onto the formation of the present research community of mathematics education researchers as a result of their experiences in the international community after WWII. In this article, the reader will identify current day tension between research, practice and policy. However Furinghetti's article stresses the possibility of a mutually supportive relationship between the mathematics community and researchers engaged in mathematics education research as well as the dependency of national policy and priorities with the political history of the country. In a similar vein, in the U.S context, Linda Sheffield (USA) contributes a paper on the history of mathematics education in the U.S with an emphasis on the changes needed in current policy to maintain a technological edge in today's world. Sheffield draws attention to the growing inequity in the United States in education and examines some consequences of "squandering" opportunities of nurturing talent in mathematics and science. The paper by Agnis Andžans, Inese Berzina & Dace Bonka (Latvia) examines the role of mathematical competitions in fostering mathematical talent at the secondary level. They write that contests are of great importance in Latvia and provide a classification of suitable problems which are algorithmic in nature, are accessible to younger students and take into account recent trends in mathematics.

On a concluding note, readers are informed that Volume 3 will consist of three issues (February 2006, August 2006 and December 2006) as opposed to the normal frequency of 2/year. The third issue (Vol3, no.3) scheduled to appear in December 2006 will be a special issue focused on social justice issues in mathematics education worldwide. Putting together a special issue on this topic is a non-trivial task and will be in no means exhaustive on the topic. We are aiming towards a multitude of worldwide perspectives on the subject. Therefore the journal would like to provide readers interested in contributing articles for the special issue to contact the Editor. We especially welcome classroom teachers working with vulnerable populations to contribute short articles on *reflective practice*. A network of experienced researchers is available to provide teachers support with the writing and the review process. We have received commitments from distinguished researchers in South Africa, Australia, U.S and Europe to contribute papers to this issue and are open to practitioner's perspectives on this issue.