THE SENIOR COLLEGE MESSENGER

Issue 24: October, 2023

This is an organ for members of Senior College to submit short articles that share news, letters to the editor, reactions to the program and anything that they feel will be of general interest. Its regular appearance will allow for an exchange of opinion of topics of interest to the members. In particular, it would be interesting to record reactions to the talks, colloquium topics and books discussed.

Please submit contributions to the editor, Ed Barbeau at barbeau@math.utoronto.ca
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SEPTEMBER COLLOQUIUM ON EDUCATION

On September 14, nine people gathered to discuss the purpose of education. While acknowledging the need for students to acquire knowledge, skills, and reasoning ability, as well as to be socialized, the discussion soon devolved into some of the problems of modern schooling. Many parents do not trust the public system to teach either the appropriate values or the preparation needed for work or further study. There is a greater turn towards private schools and homeschooling. While there has been a move since the 1960s to make teaching less regulated and more geared towards student exploration, there is a danger of a lack of focus and loss of time to ensure that students have what they need to know and be able to do. Matters raised in the discussion were the ability of tests to assess different aspects of education, the extent to which standardized testing might be tainted by elitism or racism, the grade inflation resulting from the lack of a common provincial examination, and the effects of streaming. The participants brought to the discussion their own experience as parents and professionals in describing the various issues and how they impacted the abilities of students to manage studies at the university.

Towards the end of the discussion, the important question of measuring the success of an education system was raised. There are a number of dimensions. First, there is the contemporary experience of the pupils themselves. Secondly, there is the preparation for students to be successful as adults. Thirdly, there are the benefits that an educated population confers on society at large. What should schools be teaching about our system of governance, our history, our culture and conventions, and the foundations of our morality?

Readers are invited to contribute to the discussion, expecially if they can speak to what their own experiences as parents, teachers and supervisors suggest about the attributes of successful students and schools. *Ed Barbeau*

SYMPOSIUM LINK

In case you missed the annual symposium in April or wish to have a record of the proceedings, here is a link to the abstracts.

IN MEMORIAM

Ian McDonald (d. August 25, 2023; aged 80 years)
Classical Studies Department, UTSC

CALENDAR OF COMING EVENTS

Events marked with **F** are for fellows and external fellows. Registration a few days ahead is necessary for each event. This can be done in response to a weekly email from Senior College to its members that describes the events or by going on line at www.seniorcollege.utoronto.ca .

Talks: Wednesdays 10-12 am (In person & Zoom)

October 4: Geoff Rayner-Canham, *Chemistry and Inuit life and culture*

October 11: Paul Delaney, *The evolution of the space telescope*

October 18: Heidi Bohaker, *Ontario treaties as First Law: Indigenous-Crown relations and Land Conveyance Agreements*

October 25: Joanne Tod, *The dearth of irony: postmodernism, identity politics and the visual arts*

November 1: Sue Waddington, *In the footsteps of the group of 7 and Tom Thomson*

November 8: Marie-Hélène Budworth, *Diversity at work: uncovering barriers to inclusivity in employment*

November 15: Derek Denis, *English in multicultural Toronto*

November 22: Jacqueline Gibbons, *Spread your wings: Icarus to 1912 (Flight, the men and women*

Colloquia: Thursdays, 2-4 pm (In person) (**F**)

Participants may meet for lunch at 12:30 pm.

October 12: How do we house the homeless?
(Organizers: Marty Klein, Cynthia Smith, Bill Logan)

November 16: How do we recognize historical figures whose record is now seen as controversial?
(Organizers: Trevor Lloyd, Mary Finlay, Marty Klein)

Book Club: Mondays 2-4 pm (Zoom only) (**F**)

October 2: Tom Stoppard, *Arcadia* (1993) (Leader: Alexander Leggatt)

November 6: Charles Darwin, *On the origin of species* (1859) (Leader: Sara Shettleworth)

December 4: Jennifer Raff, *Origin: a genetic history of the Americas* (2022) (Leader: Susan Pfeiffer)

January 8, 2024: Kevin Rudd, *The avoidable war: the dangers of a catastrophic conflict between US and Xi Jinping's China* (2022) (Leaders: Max Nemni, David Milne)

February 5: Alistair MacLeod, *No great mischief* (1999) (Leader: Meg Fox)

March 4: Ed Yong, *An immense world: how animal senses reveal the hidden realms around us* (2022) (Leader: Sara Shettleworth)

April 1: Willaim Carlsen, *Jungle of stone: the extraordinary journey of John L. Stephens and Frederick Catherwood and the discovery of the lost civilization of the Maya* (2017) (Leader: Jim Gurd)

May 6: Siddhartha Mukherjee, *The song of the cell: an exploration of medicine and the new human* (2022) (Leader: William Logan)

June 3: Helen Macdonald, *H is for Hawk* (2014) (Leader:Peter Alberti)

July 8: Alex Ross, *The rest is noise: listening to the twentieth century* (2007) (Leaders: Linda Hutcheon, Michael Hutcheon)

Aftermath

$1+2=3$. To put it another way: $3-2=1$. This involves all the numbers from the square of 1 up to, but not including, the square of 2. The integers starting with the square of 2 and going up to but not including the square of 3 are 4, 5, 6, 7, 8. We observe that $4+5+6=7+8$. This is easy to check. But let us do it another way:

$$(7+8)-(5+6)=(7-5)+(8-6)=2+2=2\times 2=4.$$

When we look at things this way, we get the idea that something might be going on here. While we are at it, let us look at the difference another way:

$$(7+8)-(5+6)=(7-6)+(8-5)=1+3,$$

from which we see that $2^2=4$ is the sum of the first two odd numbers.

Since we are on a bit of a roll, consider the numbers starting with $3^2=9$ up to, but not including, 4^2: 9, 10, 11, 12, 13, 14, 15. A quick check reveals that $9+10+11+12=13+14+15$. Alternatively,

$$(13+14+15)-(10+11+12)=(13-10)+(14-11)+(15-12)=3+3+3=3\times 3=9.$$

We can also note that

$$(13+14+15)-(10+11+12)=(13-12)+(14-11)+(15-10)=1+3+5,$$

from which $3^2=9$ is the sum of the first three odd numbers.

With the insight gained from these special cases, we can spread our wings. $100^2=10000$ and $101^2=10201$. I invite you to satisfy yourself that

$$\begin{aligned}10000+10001+10002+10003+10004+\cdots+10098+100099+10100\\ =10101+10102+10103+10104+\cdots+10198+10199+10200\end{aligned}$$

and that

$$100^2=10000=1+3+5+7+\cdots+195+197+199,$$

the sum of the first 100 odd numbers.

We see here a pattern of reasoning that can be applied to infinitely many instances. One of the roles of algebra is to express this infinite list of equations using variables that are subject to the rules of arithmetic and upon which we can reproduce the reasoning from our particular cases. The algebraic versions of the statements are:

$$n^2+(n^2+1)+(n^2+2)+\cdots+(n^2+n)=(n^2+n+1)+(n^2+n+2)+\cdots+(n^2+2n)$$

and

$$1+3+5+\cdots+(2n-1)=n^2,$$

for any positive integer n. More compactly,

$$\sum_{k=0}^{n}(n^2+k)=\sum_{k=n+1}^{2}n(n^2+k)\qquad\text{and}\qquad\sum_{k=1}^{n}(2k-1)=n^2.$$

Here is another infinite family of numerical equations that can be approached in a similar spirit:

$$\begin{aligned}3^2+4^2&=5^2;\\ 10^2+11^2+12^2&=13^2+14^2;\\ 21^2+22^2+23^2+24^2&=25^2+26^2+27^2;\\ 36^2+37^2+38^2+39^2+40^2&=41^2+42^2+43^2+44^2;\\ 55^2+56^2+57^2+58^2+59^2+60^2&=61^2+62^2+63^2+64^2+65^2;\\ \cdots\quad\cdots&=\quad\cdots\quad\cdots\end{aligned}$$