For Your Information

NRC Forms Committee on Research Studies

The National Research Council (NRC) of the National Academy of Sciences (NAS) has created a committee of experts in mathematics assessment, curriculum development, curricular implementation, and teaching to assess the quality of the studies on the effectiveness of the thirteen sets of mathematics curriculum materials developed with National Science Foundation (NSF) support. A selection of evaluations of non-NSF-supported materials will be used for comparison purposes.

The current committee, chaired by Jere Confrey (University of Texas, Austin), is charged with the first phase of a potentially multiphased review process. Confrey said, "We have been asked to prepare a short consensus report summarizing the results of our work, which includes creating an extensive bibliography of studies, mapping those studies according to their characteristics, and then advising if the quality of the evidence merits a full review." The committee is seeking a broad set of studies that are studying one or more of the thirteen NSF curricula as a central variable, that meet the methodological canons for acceptable inquiry associated with that methodology, and that have identified authorship and affiliation so as to give credibility to the work. The committee is soliciting evaluation studies such as the following: studies with specific student outcomes; content analysis studies; studies of classroom implementation and school environment; and studies of teacher knowledge, teacher characteristics, and professional development. These classifications will be expanded as committee members identify additional relevant categories. Carole Lacampagne, director of the Mathematical Science Education Board (MSEB), stated, "We have not limited ourselves to published studies, because summative studies of these curricula are often recently completed, but as with all NRC work, the reports must meet scholarly expectations."

The committee hosted a two-day workshop in Washington, DC, September 17–18, 2002. The meeting was intended to permit the committee to hear from various curricular designers, researchers, evaluators, mathematicians, and practitioners on their points of view concerning the evaluation of effectiveness. Panel members were asked to respond to the question: How would you define and/or evaluate effectiveness of a K–5, 6–8 or 9–12 NSF-supported curriculum, and what evidence would be needed? They were asked to identify primary and secondary variables, methods of examining and measuring those variables, research designs, and other relationships under investigation. "These are complex questions," said Confrey, "as curricular design and implementation involve many people's participation; are measured by a myriad of local and national forms of assessment; and are used across highly variable settings, differing in values, resources, cultural contexts, and forms of organization. It is imperative for us as a nation to get smarter and more sophisticated in how to conduct and evaluate such studies and to learn from our current work." Confrey added, "I believe that this NRC work can lead toward resolution of some of the debates by bringing together people and studies from a variety of perspectives and working for a common framework to establish a solid research-based foundation to improve curriculum development and evaluation and to aid schools and districts making decisions." Michael Feuer, director of the Center for Education at the NRC, added, "As long as there is a commitment to increasing the scientific evidence on questions of education, work such as this will be needed and is directly in line with the responsibilities of the NRC to provide advice to the nation."

Suggestions of studies for review should be sent to `CLacampagne@nas.edu`.

—NRC announcement

Corrections

Thanks to the vigilance of Irving Adler (who tried the method out and ran into a snag), I have noticed that one of the translations in my article "Learning from Liu Hui?" in the August 2002 issue (page 787) was faultily transcribed. It should have read as follows:

> 術曰。令一丈自乘為實。半相多。令自乘。倍之。減實。半其餘。以開方除之。所得，減相多之半。即戶廣。加相多之半。即戶高。
>
> Method: Let the 10 feet multiply itself to make the product. Halve the difference, and let it multiply itself. Double it, subtract from the product. Halve the excess. Find the side of the square. From what you obtain, subtract the halved difference, and that is the breadth of the door. Add the halved difference, and that is the height of the door.

In other words, if the height of the door is h and the breadth is b, with diagonal d (here given as 10 feet), with "the difference" being $(h-b)$, the procedure is equivalent to the modern expressions:

$$\sqrt{\frac{1}{2}\left(d^2 - 2\left(\frac{h-b}{2}\right)^2\right)} - \frac{h-b}{2} = b$$

$$\sqrt{\frac{1}{2}\left(d^2 - 2\left(\frac{h-b}{2}\right)^2\right)} + \frac{h-b}{2} = h.$$

Thank you, Irving Adler. It is reassuring to know that some readers do follow through the mathematics in articles, though perhaps not everyone has such a distinguished lifetime background in science and mathematics education.

—*Christopher Cullen*

The August 2002 *Notices*, page 818, carried an announcement about the Adams Prize, stating that the prize commemorates the discovery of the planet Neptune by John Couch Adams. The actual achievement of Adams was to predict the position of the conjectured new planet mathematically, but Adams was not involved in the subsequent observational discovery of Neptune.

The September 2002 *Notices* carried an article about the School of Mathematics at the Institute for Advanced Study. On page 899 there is a list of all past and present faculty of the school. The list should have indicated that Abraham Pais is now deceased.

—*Allyn Jackson*

About the Cover

An Exotic Coxeter Complex

This month's cover was suggested by Ken Brown's article on buildings. It shows the Coxeter complex associated to a Kac-Moody group with Cartan matrix

$$\begin{bmatrix} 2 & -1 & -1 \\ -2 & 2 & -1 \\ -1 & -1 & 2 \end{bmatrix}$$

whose Coxeter numbers are 4, 3, and 3. The three generators of the Weyl group of this Kac-Moody algebra act by skew-reflections in three real dimensions, and the Tits cone is the orbit of the Weyl chamber, which is a simplicial cone and the fundamental domain for the Weyl group's action.

The transforms of this chamber are also simplicial cones, and the illustration on the cover shows a slice through these. The fundamental domain is gray, and its transforms by the generators are also marked. Edges between chambers are colored according to the generator involved in the transition between them.

The Kac-Moody algebra involved is not symmetrizable. This means that the boundary of the Tits cone is not an ellipse. According to Kac & Vinberg (*Mat. Zametki* **1** (1967), pp. 347–54) the boundary is not even C^2. Its detailed structure, and its relationship with the structure of the Kac-Moody group, seem to be unknown. This is not unusual in the subject of non-symmetrizable Kac-Moody algebras, which are well situated in *terra incognita*.

—*Bill Casselman* (`covers@ams.org`)