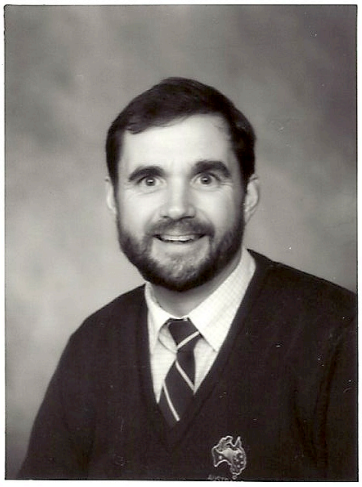
ARNE ENGEBRETSEN
1946-1998

**"Successful is the person who has lived well, laughed often, and loved much,
who has gained the respect of children, who leaves the world better than they found it,
who has never lacked appreciation for the Earth's beauty,
who never fails to look for the best in others or give the best of themselves."**



Arne's spirit and love for learning touched the lives of many during his 29 years of teaching. He spent all those years at Greendale High School where he began teaching in 1969 after graduating from UW-Oshkosh. His masters in Curriculum and Instruction was completed in 1973 from UWM.

He was recognized many times for his contributions as a teacher, beginning with the Greendale Jaycee Award in 1976 for the Outstanding Young Educator. In the years that followed he presented countless workshops at regional and annual NCTM meetings, held offices in the Greendale Education Association, Wisconsin Mathematics Council and MAMC (Milwaukee Area Math Council) and became involved with the Calculator and Computer PreCalculus Project (C2PC) Institute at Ohio State in 1988. He was passionate about the use of technology in the classroom and could inspire students of any age with his enthusiastic approach to problem solving. In 1990 he was honored at the national level with the Presidential Award for Excellence in Secondary Mathematics. He continued to share his expertise with other teachers leading Texas Instruments T^3 summer workshops throughout the country. In 1996, the WMC selected him for the Distinguished Math Educator Award. Arne was one of the recipients of the Tandy Technology Scholar Awards for 1998 which rewards academic excellence in mathematics, science, and computer science. He was most recently recognized by UWM in October of 1998 with an Alumni Achievement Award in Secondary Education.

On April 28, 1998 Arne's plans for another summer of workshops and the T^3 conference in Japan were canceled with the diagnosis of glioblastoma multiforme - a malignant fast-growing tumor. He did not return to the classroom but concentrated his energy on enjoying his last months with family and friends. He bravely faced chemotherapy, radiation and a second surgery, however in less than 8 months, cancer claimed his life.

The Arne Engebretsen Memorial Scholarship serves to honor his leadership and service, inspiring others to "give the best of themselves" as they further their education goals beyond high school.

A Pleasure of Teaching Without Teaching

or *A Joy of Transfer Without Transferring Knowledge*

Introduction by Bert Waits and Frank Demana, T^3 co-founders

Professor Shin Wantanabe was one of the first teachers in Japan to use graphing calculators to enhance the teaching and learning of mathematics. He is a wonderful and enthusiastic friend. He has attended our Ohio State summer T3 sessions and many T3 conferences over the past 5 years. Shin is now T3 Japan Worldwide Coordinator. Shin met Arne a number of years ago and they became good friends. We leave the rest of the story for Shin. It is both a tribute to Arne and Shin.

By Shin Wantanabe, Tokai University, Japan

(Note from author: The title is not easy to be translated in English with the nuance of wording in Japanese)

It has been known that a teacher's role is to transfer knowledge to students. Many of the teachers whom I know do not hesitate, at all to do this in his/her enthusiastic efforts of teaching. And this is a "base" of mathematics instruction, which only exists with teachers who are able to derive pleasure from knowledge transfer to students. About this process of transferring knowledge, I had a tremendous shock [eye opening] last year in the US, by learning from Teacher Arne who teaches mathematics in a US high school.

It was in October of 1997 in a suburb of Milwaukee, where there was a very peaceful, nice town. I visited Mr. Arne Engebretsen at a public high school located in the middle of a nice residential neighborhood. At the airport, all the Engebretsen family members had kindly welcomed me with a large piece of cardboard with my name on it. I was a bit nervous for finding his house in the area, a stranger myself. I felt so much good when I saw my name in large letters put-up by the family. I was excited that my 3-day stay with Arne's family and visiting his school had begun.

There are only small numbers of articles available to Japanese teachers with information about US high school math education. I myself found several differences in comparison of math education in Japan. One of my interests was that US math teachers were more "professional" in instruction. Their role can be concentrated on mathematics instruction itself while Japanese teachers tend to be busy also in guidance of school life, maintaining class activities, and miscellaneous office works in schools, besides teach in classes. Instead, teachers in US have 5 classes in a day, and 25 periods of classes in a week. It is just busy every day. I observed that US teachers have much more pride as a professional.

I visited one of Arne's classes that is "project" oriented. Students are divided into several groups and they are using CABRI geometry software on PCs and TI-92's. The class is constructed in 3 steps.
Step 1: Group activity where students initiate a problem to be solved.
Step 2: Group submits their report and does a presentation/discussion.
Step 3: Class to solve problems together.

I observed for 2 days how the groups worked. Students were sitting in front of PCs to complete their report papers. I noticed there area lot of misunderstandings and making wrong conclusions. There seemed to be almost no group who reached a correct solution. Teacher Arne was walking around among groups and gave no advice at this stage. It seemed like he was not teaching. Questions among students were only about how to handle printers, etc. There were no traditional mathematics questions. The class period was over without anything written on a chalkboard. He just put all papers from students into a box with a happy face, and then went home. We together read all papers in the late evening, until 2AM! He was saying, “My students are wonderful. Thinking a lot. Enthusiatic!” as if talking to himself. He spent long hours to read papers very carefully. The next day, the class had many discussions. Teacher Arne took the chair and there were a lot of opinions running around. I was so impressed that Arne had clearly memorized the contents of each report and the student’s name precisely. I noticed that he had observed and recognized each way of thinking by this student during walking around and observing the groups. As a matter of fact, Arne seemed to be frustrated a bit, “How come they didn’t reach a correct solution?” The class was over. And my observations at his school were finished with this period, unfortunately.

After I was back in Japan, Arne sent me an e-mail saying that all groups reached the correct solution with an additional few periods of classes. And that much more wonderful reports were completed. Arne did not “teach” anything. I had noticed that he was trying to teach knowledge to students. But, Arne helped me realize that students obtained much more than he was trying to teach. He knows a secret of teaching which is “a joy of teaching without teaching”, in other words, “a pleasure of letting them learn without teaching” by utilizing the power of technology, and by the powers of the students themselves.

I myself now think about looking back to consider what I was doing in classes. I now wonde if I have been doing too much by concentrating my teaching to convey only facts, and theories to students. Arne helped me to see that perhaps what I have been doing is to cause students to be put off from all the pleasures of learning and enjoying studying mathematics. It is very important to allow students to learn with their own investigations of discovery, thinking and manipulation. To make this happen, the teacher’s role is to support them, and to facilitate their activities. And “technology” – graphing calculators and computer software like CABRI helps bring this about – doesn’t it?

I have my good friend Arne in my heart now. I was most lucky to have been able to visit his school and see his mathematical lessons in person. For me it was very good. And my teaching has changed for the better because of Arne. I wanted to do this short paper for thanks to Arne. I will deeply miss my friend Arne.