LSI Journal

# Great Science Expectations

*by Gerald Mallmann (January-February, 2002)*

***T**he following is a presentation by our executive director first given to a teachers conference in 1982. In it he shares his concerns about the state of science teaching in our Lutheran schools.*

Indeed, fellow teachers, a great many things have been reviewed via interviews, correspondence, and reading on the topic your program committee asked me to present at the October conference for the 1982 Wisconsin Synod Teacher's Convention. For this opportunity I thank them.

Like most topics the title doesn't really give the parameters of the way the subject is going to be treated by the speaker. This is why I have allowed a preprint to circulate. We are concerned with:

A. What the grade school child is to get in science to best handle the high school requirements.
B. What the high school science demands are.
C. Where the problem is in reaching desired goals.
D. What the present curriculum is lacking.
E. A possible solution for the 1980's.

In general there is no uniformity in what is taught as science in our schools or the public schools throughout Wisconsin and most states. The choice of textbook commands much of what is taught. The students are generally reluctant to use the metric system, have few or no lab skills, and have no orderly system to record observations correctly. If the experiments do not come out like the book says they are greatly disturbed. Most of the students have been programmed for true-false or multiple choice responses. Essays or full sentences can only be hoped for. In actual subject matter there has been no uniformity in a class as a whole because the make-up in a federation of congregations is rather individualistic. All students share in the lack of knowing the order of events in history whether of the Bible or of science. Moses and Noah often get twisted around as with other events.

In 1960, I was asked by a WELS school district to suggest a K-8 science curriculum. With the help of Adolph Fehlauer, Dr. Gross (then at Concordia Teacher's College in River Forest), and the existing form the synod had, we developed a K- 12 study. The reason for the K- 12 is to let the elementary teacher see what, where, and when their subject matter is reviewed and expanded or built upon. Likewise, each teacher could see what was suggested to be covered in each grade and may wish to make a trade because of some special interest in that subject. Also the amount of repetition that each subject received would be noticed. I have seen some schools that teach magnets and magnetism in every grade and still miss some of the basics that should have been covered. We stayed close to the synod's suggested course of study as it had already been released with Dr. Gross having contributed to it. I was at that time involved in science curriculum building courses at Colorado State College, Greeley, Colorado where fortunately my professors were the nation's leaders in the field. They were Dr. Harvey Glidden and Dr. Donald Decker (later president of the National Science Teacher's Association). To encourage implementation and with the help of Lester Ring I designed a wheel form of the course of study after I had graphed the subject matter as to how much time should be given each (See the graph on page 14.) The original was K-12, but we are concerned here with K-8). These were printed in quantity and have been available since 1960 at the conferences and through the Lutheran Science Institute, Inc.

So we can look back on over twenty years at a suggestion to improve the quality of science, at least to organize it a little. I could have easily gone through that for this time with just up-dating the suggestions, but it bothered me. I don't believe it would be accepted any better now. The problem is elsewhere. If you don't mind my stepping on some toes, I will tell you where it is as I have observed it. As mentioned at the start, I have approached this problem with over fifty teachers since last February. First the good news! The K-4 teachers are doing an excellent job in teaching the sciences, so our problem is not there and we won't spend time in that area. It seems to begin at fifth grade and worsen at seventh and eighth. There seems to be a lack of interest, uniformity, core, reliability, student confidence and most of all sufficient time devoted to the subject. Who is teaching the upper grades in our system? It is usually a man, often he is also the principal, coach, physical education director, choir master, organist, administrator with the added tasks of punching milk tickets and presenting reports to the PTA and congregation meetings. He has the athletic program to direct which in recent years has doubled in work with the girls getting equal time. Oh, yes, he has to teach....

Now look at the general background of the man in this position. A DMLC graduate where when he was exposed received excellent courses in how to teach grammar, English, history, religion, geography, fair math, art and vague science. Notice I said how to teach these subjects. If he was interested in science it showed in the very first years of his teaching, and he was grabbed up by the secondary system. (e.g. Festerling, Kock, Blauert, Ash, and Willems)

It is only human to teach what you best understand and like to teach. *Enthusiasm rubs off on the student as does discontent.* When then was science taught? I have been told on Friday if the art class got cleaned up on time and the class didn't have to sing the coming Sunday.

Now I have reached the age to know you don't solve problems by griping about them. You must offer a solution or two or keep quiet. The trouble with suggesting a solution is that you then find yourself on a committee to implement your suggestion. At this risk I'm offering a suggestion.

Begin with the strong points; we have a teacher that generally can teach grammar, history, geography and religion. So why not teach a history of science emphasizing the time periods that most concern us in better understanding our Bible, the creation, the continuing preservation, provisioning and the gift of wisdom so timely to spread His Word to all mankind. This rendering could easily supplement the history course and even be stretched for a two year course. In the October 1982 *LSI NEWSLETTER*, three approaches were suggested for a science course. In view of the circumstances observed, the teaching of a subject matter or the disciplines of science would be a failure. Let the secondary schools take that route. It is very difficult to keep up-to-date in subject matter unless one constantly attends workshops, summer school and reviews the journals. For example, my new 1981 textbook is failing to cover the 1978 discovery that there are life forms on Earth that do not depend on photosynthesis, oxygen, or the sun as a source for their energy need. Deep in the ocean off the coast of Peru near a volcano vent far from ever receiving any sunlight, were found giant worms (8 feet long) and other animal forms unknown to man except perhaps in fossils and in the little 8 centimeter relatives. It was so nice to faithfully plug in the carbon-dioxide-oxygen cycle as presented in all the textbooks. Many biology teachers still do and let it go at that, but is that being honest with observed data? Also I have been exposed to four different forms of the periodic table of elements in less than fifty years. We can't expect the elementary teacher to handle all these changes as they come up. There are a lot of changes in history coming so watch for them as archeology uncovers more data.

The topic approach, e.g. time, space, matter, energy, and life, also requires more attention to subject matter than can be expected of a teacher. Just look at Rev. Harold Warnke's treatment in his outlines. The secondary science teacher again is a specialist in these if he continues his education. The chronological approach seems to be worth trying for our situation.

It looks as though most of us would appreciate a textbook to support our presentation. I'm not aware that one exists, but I do know of a person in our synod that has been working in this direction for over twelve years. I have approached him to expound on his intentions and progress, but he declined. Aside from his material I believe a textbook could be produced by some of the talent within our synod if those persons were relieved of some of their teaching load and the synod commitments placed on them. It is really up to you to express your desire here if such an attempt should be made. I'm sure the Lutheran Science Institute would be happy to organize such necessary talent and bring a book in for your approval.

Several teachers asked about how the lab work would be fitted to a chronological approach. I like that kind of thinking. For lab, the "hands on" conditioning is what makes science unique and gives the student the feeling of how a scientist works. We suggest exposing the student to scaled-down replicas of the very inventions these early scientists developed, and repeat their discoveries. An appreciation of the limits of what science can and cannot do in measuring and observing can be demonstrated with labs using magnets, batteries, transformers, Telsa Coils, steam engine, levers, electric lights, telegraph, phonograph, radio, camera, gears, punch card controls, looms, clockworks and tools including the lathe, drill, bore, plane and grinder. He should make actual measurements of volumes, masses, speeds, and determine densities or boiling points and freezing points. Show that student how to record those observations honestly and perhaps mathematically arrange his data (graphing) to suggest possible trends that could be used to make predictions. From all this he will recognize how absurd the evolutionist is in extending the predictions far beyond the scientific accepted limitations.

To conclude, we can expect an eighth grader to have a fair understanding of the chronological history of science strongly appreciating the contribution occurring during the creation week, the flood, at Christ's time, Reformation, Colonial times, the industrial revolution, World War II and modern times. It has been shown how other approaches failed and how this one differs enough to be possible. A method of how to implement has been given and all that needs to be done is for you in some form to encourage anyone of your choice to "go to it" and give your support. I close with asking your chairman, "What is your pleasure?"

See the science curriculum chart on the next page. *LSI*

# Suggested Science Curriculum

| | K | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 100% | Gravity Fire | Magnets Gravity | Magnets Gravity | Heat Sound | Air Time Light Sight | Metric system Weights Measures | Rockets Electricity Phases of Matter | Forces — Energies Electronics History of atoms | |
| 90% | Birds | | Combustion Poisons Explosives | | Air | History of | | Nuclear Atom size and volume | |
| 80% | Mammals | | Birds Amphibians | | Collecting | Science | Natural resources Mining Minerals Explosives | Oxidation Phases of matter Acid — Base Paints — Medicine | |
| 70% | Fish | | Circus Reptiles | | Museum's function | | | Dow — Dupont Rubber Nylon | |
| 60% | Plants | | Marine life | | People in Biology | Water cycle | | Insects Eye Nose | Human biology Senses |
| 50% | Seeds Leaves | | Plants | | | Resources Conservation of soil, plants, animals, man | | Irrigation | Animals Plants Histories (biological) |
| 40% | Insects | | Insects | Hearing | | Farming Methods Taste and touch Skeleton — Ear | | Plants & Growth | |
| 30% | Health | | Health | | | Health, Role of Doctor | | | God and science Conservation Inventions Limitations |
| 20% | Safety | | Soil | Safety | Aviation | Safety | Age of Earth | | Automotive Tools Automation |
| 10% | Rocks | | | Public works Utilities Gas — Light | | | Effect on Homelife | | |
| 0% | | Communication Transportation | | | | History of science | Earth science | Science in Art | |
| GRADE | K | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |