Jun 1st

Concluding and Banquet Remarks and Speech

Multiple Authors

Concluding Remarks

Bengt B. Broms, President, ISSMFE
Singapore

Dear Colleagues and Friends,

It has indeed been an interesting three days with many thought provoking lectures, interesting papers, almost 400 of them, and intense discussions. The following are some comments on a few of the papers. These comments reflect very much my particular background and special interests.

The poster sessions have in general been well prepared with good illustrations which highlight main points in the different papers. This is a new form, which was introduced three years ago at the International Conference in San Francisco (12.ICSMFE). I believe, however, that we are not taking full advantage of the opportunity to discuss directly with the authors the content of their papers, limitations of new proposed design or construction methods, modifications of the methods that had to be made before they are used in practice because of some special considerations.

The most interesting case records are often those where something unexpected has happened. And the unexpected happens on almost every job. Proper and adequate instrumentation is important but the instrumentation I believe had to be simple and above all reliable. Sometimes structures are overinstrumented and the collected data so immense that nobody has the time to analyze the results until it is too late. There should on every job be clear and concise instructions when and what to do if something unexpected happens, e.g. when the settlements or the settlement rate becomes excessive.

Settlements and lateral displacements are generally easy to monitor as well as the settlement rates. There are several papers at this conference that indicate that the first signs of an imminent failure are excessive settlements or large lateral displacements. For every job I believe there should always be a prediction of the settlements and that the predictions are made in advance. However, the settelements are often overpredicted by 50% to 100% or more. Pore pressure and earth pressures are difficult to measure and to monitor since they are affected by a large number of factors at the point where they are measured. These factors are frequently very difficult to quantify.

The most common cause of problems or difficulties, I believe, is inadequate or poor investigations both in the field and in the laboratory of the strength and deformation properties of the soil and of the rock partly because of the competitive situation. There is, therefore, a trend towards in-situ testing because of the often low quality of the recovered samples. A number of new tools have been developed. I am thinking of geophysical methods, ground penetrating radars, new types of penetrometers, the piezocone and the dilatometer. Considerable improvements have also been made of traditional methods, e.g. the standard penetration test (SPT), which is not yet a standard testing method. In the United States, the rope and the cathead method is normally used to lift and to release the hammer. In Europe and in Asia, it is common to use a free falling hammer. The difference in energy can be large, about 30%. This means that the SPT results from different parts of the world cannot be compared directly and that the results had to be corrected. The ISSMFE Technical Committee on Penetration testing (TC 16) is working on a reference testing method for SPT which was discussed at the conference on penetration testing which was held earlier this year in Orlando, Florida (ISOPT-1). Also new methods for sampling of soils, both sands and clays have been developed in order to improve the quality of the samples. There is another ISSMFE Technical committee working on this problem (TC 24).

At several recent conferences it has been pointed out that there is always a risk involved in whatever we do and that there is a need to quantify the risks. But there is also a need to quantify the costs involved in order to reduce the risk to an acceptable level. However, it is often possible to reduce the risks and the costs through the observational methods, by monitoring carefully the behavior of the structure during the construction.

It has been a privilege to be invited to this Second International Conference on Case Histories in Geotechnical Engineering. I would like to congratulate Professor Shamsher Prakash and the University of Missouri in Rolla for a very interesting and a very well organized conference. I hope to see you all soon in the near future.

Resolution

Participants of the First International Conference on Case Histories in Geotechnical Engineering held at St. Louis from May 6 to 11, 1984, had, inter alia, resolved that International Conferences on Case Histories in Geotechnical Engineering be organized periodically. The conference concluding today lays the second milestone and, vindicates the vision embodied in the above resolution. The recognition that Case Histories provide a major driving force in advancement of the frontiers of geotechnical engineering has steadily grown since the first conference and it is therefore natural that the earlier decision to repeat the conference periodically is reiterated by the participants of the second conference. They further resolve that:

1. The future conferences be organized registering patronage and participation of like-minded professional bodies and the University of Rolla, Missouri, may continue to take initiative till such time more enduring alternative emerges.

2. Case Histories in Geotechnical Engineering being a subject of universal interest, the venue of the next, and subsequent conferences, be so selected as to ensure that the benefits are distributed uniformly across the globe.

Banquet Remarks

IR E.H. de Leeuw, Deputy Managing Director,
Delft Geotechnics
The Netherlands

Mr. Chairman, Ladies and Gentlemen,

A few hours ago, I was asked to say some words at this banquet. I know that I should have felt honoured to be asked. But to tell you the truth, I felt more surprised and even confused than honoured.

My very first reaction was: Good Lord, I am getting old! For as far as I can remember -- unless you have a special position like the previous speaker, Professor Broms -- banquet speakers usually are the older and more respectable type.

Fortunately I now understand that there is a series of five minute speakers (I hope there is no buzzer this time!). And since I was placed high on the list, there is plenty of opportunity to recover and erase the impression my little speech may make.

Then I figured it would have been wiser to ask an American University professor. For they are the persons who <u>really</u> can talk; as we have heard once more in the past <u>two days</u>. They make excellent banquet speakers!

They could even do this by heart. I regret that my talents do not reach so far, especially in a language which is not my own. I had to make a few quick notes. So my words are not spoken by heart, but they still come from the heart.

Still trying to figure out why I was invited, I assumed that our Conference Chairman used the theory of probability in choosing tonight's speakers by asking himself: -- How high is the probability that I choose someone who will start saying nasty things about this conference and its organizers? And Professor Prakash knew, by asking me, that this probability would be quite low. (Laughter)

I have known Shamsher Prakash for quite a long time now. The first time we met he was still a bachelor, too busy to get married. I understand that right now he is married and still too busy.

Professor Prakash knows that both my wife and I have a great admiration for his home country and for its people, who we learned to appreciate and love during a number of beautiful holidays we spent in India.

Still it is quite nice to be back in the United States. It is a bit being home away from home. Many of the things we have at home in The Netherlands, you also have here:

- Sheraton hotels
- Burger King around the corner
- McDonalds floating on the river and
- I Love Lucy on TV.

But, really, I have the impression that also the influence of European culture is slowly penetrating the United States. (Laughter) I am not talking about the romantic picture of Hans Brinkers shown by Professor Silver this morning, since he is a Dutch boy created an American lady, who had never seen a dike in her life.

Actually few Dutchmen really know the name Hans Brinkers. And that is is a bit embarassing because American tourist keep asking: - Where did Hans Brinkers live? Well, <u>we</u> don't, <u>they</u> should tell <u>us</u>!

So what we do, we show them the cottage where Czar Peter of Russia lived when he was in Holland to be trained as a shipbuilder. Most Americans then are impressed and satisfied. To satisfy the most insistent ones, we finally decided to put up a quite nice statue of this boy-who-never-was in the village of Spaardam, just outside Haarlem.

No, my impression of the growing European impact on daily life in the US, is based upon an observation I made in the restrooms of this hotel, where you wash hands with Eurobath, European Protein Body Shampoo with Glycerine.

And I can assure you, ladies and gentlemen, that this is only a beginning. For you may know that in four years time, in the magic year 1992, the national borders in Europe will be taken down.

There will be one European market, Europeans will have European passports and in the civil engineering field there will be European engineers using European codes valid for all European countries.

And this brings me to my next point. I think that the organizers of this conference did a splendid job. It is great to see that so many answered their call to send papers and to convene here in St. Louis.

It would be a shame to leave it here. Let us hope that in a few years time, Professor Prakash will sound his bugle again to call us for the Third International Conference on Case Histories in Geotechnical Engineering. Maybe in a somewhat modified format. Hopefully integrated in the framework of our international professional organizations.

It has been suggested that a Third Conference not necessarily has to be held in St. Louis. If the organizers agree with this idea, maybe the birth of the United States of Europe in 1992 would be a good excuse to organize this Third Conference in Europe.

I am sure that the Netherlands National Society for Soil Mechanics and Foundation Engineering would be very interested to discuss the possibility to hold the Third Conference in The Netherlands. For example in Amsterdam or The Hague, which is so nice a place that even the Queen lives there!

Organizing a conference is hard and exciting work. I know since I have been and still am involved in the organization of several of these conferences.

By the way, if some of you have no excuse to go anywhere in August this year, why not come to Delft, The Netherlands, where we are organizing a first-time conference on water-soil-structure interaction? Sponsored by the International Society for Soil Mechanics and Foundation Engineering and the International Association for Hydraulic Research.

Organizing a conference is hard work. Prakash realized that. He carefully selected a truly international crew of coworkers. I understand they are from countries like India, Zambia, Guatemala and even the United States. They all did a splendid job.

Therefore, I think they all deserve our deepest gratitude for bringing us together here in St. Louis, for creating a warm friendly atmosphere and for making us feel at home.

Finally I think we have to thank especially the charming Mrs. Prakash for letting her husband organize this successful event.

Thank you for your kind attention.

Sven Hansbo, Professor, Chalmens University
Sweden

Tonight, as in the previous St. Louis conference, in 1984,
I have again the honor of being seated
so as to feel obliged
to say some words of thanks.
Again I have been nourished,
as all of us,
with delicacies of Missouri/Illinois
but with one exception in relation to before:
this time we have been offered wine.
Last time I stated
that had we then had wine
I would have kissed all those
that then were present, (Laughter)
Professor Prakash and the hostess above all,
but don't you worry,
I shall show mercy
I shall refrain from doing so
although, in fact,
Professor Prakash and Miss Janet Pearson,
as well as host and hostess,
should well deserve it. (Laughter)
So, therefore, accept my heartfelt thanks
without kisses
for the arrangement of this conference
extremely interesting, as we have found.
So well it has been organized.
It represents a great success.
Professor Prakash and Miss Janet Pearson,
we thank you heartily
for taking all the trouble
of organizing this successful conference.
And may we meet again in 92.

6/S.P.

Banquet Speech

Dr. Martin C. Jischke
Chancellor, University of Missouri-Rolla
Rolla, Missouri

It is a real privilege to join you this evening at the Second International Conference on Case Histories in Geotechnical Engineering.

On behalf of the entire University of Missouri-Rolla campus, I would like to express our pleasure in your conference participation. Engineers, scientists and teachers from all over the world are here to take part in a five-day exchange on the latest geotechnical engineering information.

I was looking at the list of conference participants this afternoon, and I found your credentials to be awesome. Indeed, you are among the world's leading technological experts, and, as such, I feel that you will share in a belief in the pivotal need for scientific literacy the world over.

I would like to talk with you about that literacy tonight, but only briefly, as I am reminded of the story about a speaker who showed up at an engagement with a cut on his face. He said that while shaving that morning, he had been concentrating on his speech. That diligence accounted for the injury. At the reception which followed the 50-minute address, a friend whispered in his ear, "next time, concentrate on your face and cut the speech." (Laughter)

So keeping brevity in mind, I want to talk to you about the need in our world for a scientifically literate society.

Modern communications and transportation have catapulted us into a world economy whose impact on individual nations is startling. The future will surely bring even more astounding insights into the nature of our world and with this new science will come applications more mind boggling than ever. The evidence seems clear that, throughout the world, the leaders in science and technology will also lead economically, militarily, and in other ways. In the most fundamental sense, leadership in the world will depend on what is known and on the intellectual strength of nations, especially in science and technology.

I submit that, while our future is limited only by our imagination, our ability to seize the opportunities of the future will depend on how clever we are, particularly in science and technology, and, looking at the United States, statistics show cause for concern about the scientific literacy of our country.

For if we are to realize the fruits of the technological acheivements of the twenty-first century these developments must come from our young people. But, a study by the National Research Institute shows that more than ninety percent of U.S. adults are technologically illiterate. They have no background in physics, chemistry, biology or imtermediate mathematics.

And, reports show that the elementary and secondary school students in the U.S. are not receiving the scientific and mathematical background which they must have in order to keep this nation at the leading edge of future technology.

The National Science Teachers Association released a survey last year showing that of the nation's 16,000 high schools, more than 7,000 offer no physics courses; 4,200 offer no chemistry; and 1,900 offer no courses in biology. As a result, only one-third of this country's students in grades 10 through 12 are currently taking any science courses.

This is not the case in countries with which the United States must compete, according to a recent St. Louis Post-Dispatch opinion editorial by John Mason, head of the Monsanto Fund. In the editorial, Mason noted that students in the U.S. are exposed to only one-third to one-half as much science as their counterparts in West Germany, Japan, East Germany, and the Soviet Union. The predictable result, as a National Science Foundation study just reported, is that, in the United States, high school seniors ranked eleventh on a thirteen-country list in knowledge of chemistry, and last in biology.

Another report of the International Association for the evaluation of Educational Achievement found the U.S. to be among the lowest scoring countries in physics as well as in chemistry and biology.

That association has also released a study which compares science achievement in seventeen countries. At the eight and ninth grade levels, the highest scoring countries are Hungary and Japan and the lowest scoring countries are England, Hong Kong, Italy, the United States was third to last out of seventeen countries. The report concludes that for a technologically advanced country, it would appear that a re-examination of how science is presented and studied in the U.S. is required.

And the National Science Board says that "there is no evidence of an upturn in the low performance levels of U.S. school children on science and mathematics achievement tests, nor in their continuing relatively poor performance on such tests in comparison with some other industrial countries.

"U.S. state and local school jurisdictions have recently been investing significant resources in this problem area, but it is apparently too soon to see any results."

In short, U.S. elementary and secondary schools are coming up short in science and mathematics education.

There must be a solution. I believe that all of us who value education must recognize the clear danger that lies in the growing weakness of countries such as the United States in matters of science and technology. And we must act. While many factors play a role in determining the scientific literacy; second, we must produce more scientists and engineers; and, third, we must find ways to more effectively and rapidly utilize our technological brainpower.

First, let's look for a minute at general scientific literacy. This literacy is determined largely in the elementary and secondary schools. It includes knowing basic scientific facts, such as the chemical makeup of our world, the nature of forces and energy, and the most elementary notions of biology. Improving scientific literacy requires enhancement of curricula, teaching, and laboratories.

The Soviet Sputnik satellite was launched in 1957. It occurred almost a year before the United States was able to put up its own satellite and led to increased National Science Foundation support for science course improvement programs in our schools. The results showed that students are able to achieve far more than we in the U.S. require today. I submit that today's scientific crisis must, indeed, stimulate the curricula improvements that include new and challenging courses and textbooks and other materials to allow students to stretch intellectually to their potential.

Second, we must encourage more of the most able young people into teaching and outstanding teachers must be rewarded with better salaries, more prestige, and recognition. These dedicated men and women who teach our youngsters and lead them toward a good scientific and mathematical background, must be nurtured in their teaching fields. We cannot achieve greatness scientifically unless we reward great science teachers.

And in the teaching of the very latest scientific developments, let us not overlook the need to develop in our students the habits of mind and attitudes which allow learning to continue beyond the classroom. This is a plea for cultivating within ourselves and our students a sense of curiosity, a joy of knowing, a lifelong enthusiasm for learning.

And, finally, in our quest for general scientific literacy, let us provide our children with the laboratories that enable them to experience the excitement of science. Increased instruction in the use of computers, the most modern laboratory equipment, and projects which stimulate the mind as well as teach basic scientific principles must be a part of everyone's most basic education. This kind of instruction requires additional funds and a commitment to a national strengthening of scientific and mathematical education at the elementary and secondary levels.

The second part of my prescription for regaining technological health is the generation of more scientists and engineers.

As technologically trained professionals, we who are here tonight know that engineering and science are exciting and rewarding professions. And being chancellor of an institution which ranks ninth in the country in the number of bachelor's degrees granted in engineering, I must restrain myself from trying to get every young person I meet to come to our campus and discover the opportunities that await them there. But whatever the university, there are some good reasons why young people should consider becoming an engineer or scientist.

The national Science Board in its Science & Engineering Indicators Report for 1987 said that in the U.S., "the shrinking of the college-age population suggests difficulties in maintaining an adequate flow of new science and engineering personnel unless young people--especially minorities and women--can be induced to increase their participation rates in college science and engineering programs."

And, the report foresees good job opportunities for those who enter science and engineering fields. It states that "high technology industrial growth and the increasing use of high technology goods and services in the U.S. economy as a whole will lead to increasing demand for scientists and engineers in industry. Demand for science and engineering personnel is expected to increase by 36 percent between 1986 and 2000 with the highest anticipated growth for computer specialists."

The Board goes on to say that "never in the history of science have there been so many opportunities in science and engineering, as exemplified by areas such as superconductivity and biotechnology."

Finally, in my prescription for technological leadership, I believe that all nations must have more effective and rapid utilization of technology.

Again, qucting the National Science Board, in 1986, the U.S. balance of trade in high-technology goods became--for the first time ever--a negative. The United states bought more high tech goods than it sold. The high tech competitiveness in this country has slipped.

Throughout history, technological innovation has been the primary force behind economic development and success. This relationship is universally recognized and well-documented. For example, a recent Brookings Institution study attributes 44 percent of America's increase in productivity over the last 40 years to technological innovation. Other economists estimate that during the past 20 years, innovation has accounted for two-fifths of the growth in the United States Gross National Product.

These are changing times for America. Where its technological and economic supremacy once went unchallenged, we now find that no longer to be the case. The pattern of the last fifteen years--slowing productivity growth combined with growing competition from foreign producers, especially Asia and Western Europe--has led to record trade deficits, a decline in real earnings of American workers, and a stagnant standard of living.

Restoring America's competitive position in the global marketplace is the most demanding challenge facing America's leadership today.

Much of this country's high tech economic progress is the result of small businesses lead by technological entrepreneurs.

In a recent St. Louis Post-Dispatch opinion editorial, Beverly Winkler of Southwestern Bell, said that the U.S. has had no shortage of good ideas. Videocassette recorders, calculators and leading edge computers were originally conceived in America.

"But," she says, "time after time, the development for mass production and marketing was done by the Japanese. They recognized good ideas and had the resources to capitalize on them.

"High-tech skills are needed by those who back up the creative innovators. The skills to manufacture and maintain the high-technology systems are as important as the creative skills that design them." Having great high tech inventions will do little good, will produce few jobs, if people are not prepared to make these products cheaply and with high quality. Otherwise, they will be made in Japan, Korea, and elsewhere.

Accomplishing technological growth in communities requires a pulling together of everyone, the strategy must be one that helps very community become more competitive.

There are 7,400 manufacturers in Missouri, for example, employing 430,000 workers. Thus, the average company employs less than sixty people. Many of these small businesses supply others who assemble parts to form finished products such as automobiles, airplanes, and electronic goods.

Technology and the organizational and management concepts needed to exploit the technology, must be taken to the manufacturers in every region. All of us must extend a helping hand to accelerate the wise application of new technology.

Briefly, tonight, we have looked at what all of us must do to enhance scientific literacy.

The National Science Board has stated that Americans can no longer take American Scientific and Technological dominance for granted. "Not since Sputnik has there been so much cause for concern about the adequacy of the U.S. science and technology base."

Let the future of us all be one of scientifically literate people who can create an even better world than the one in which we live today.

I would like to reiterate the feeling of privilege which all of us at the University of Missouri-Rolla have in your participation in this geotechnical engineering conference.

I wish you the very best in your exchange of ideas during the next few days.