WELCOME ADDRESS

Major General Victor R. Haugen

Commandant, Air Force Institute of Technology

I feel pleased and priviledged to have the opportunity to welcome you to the Conference on Matrix Methods in Structural Mechanics. The School of Engineering of the Air Force Institute of Technology is honored to act as a host to this conference and we will do our best to ensure the success of your meeting.

The principal object of this conference is to exchange technical information by means of lectures and discussions. As with other such conferences, however, I am sure that there also will be a "by-product" of great value — the friendships formed among you scientists and engineers working in a common discipline. The complexities of modern scientific developments are such that a single individual can hardly hope for a spectacular break-through when working by himself. The "team effort" is the vogue nowadays and the area of matrix methods of structural analysis is no exception. Pooling the results of individual efforts accelerates markedly the progress in a particular discipline. The same technique can also greatly influence scientific achievements in other disciplines. This "interdisciplinary" and "cooperative" character of scientific developments appears to be the hallmark of our present technological era.

Advances in computer technology have accelerated interest in matrix methods. Although some of the fundamental concepts used in the present day matrix methods were known in the middle of the 19th century, it was not until the introduction of modern high speed digital computers that the full potentialities of these methods began to be exploited. There has been considerable progress in the development of these methods in recent years. Completely automated computer programs are now available for the analysis of complex structural systems. Matrix methods are also being extended into the nonlinear regime to include large deflections and the stability phenomena. The effects of plasticity and creep are also being investigated by these methods. However, the most spectacular developments have been the synthesis methods leading to the automatic generation of optimized structures with minimum weight. These latter developments have been accelerated by transplanting ideas and methods from operations research. Thus, we have had here a clear demonstration of the interdisciplinary character of the scientific endeavors in the area of matrix structural analysis.

Your meeting is truly international, papers will be presented by authors from many countries. It brings together the foremost scientists and engineers in the field from Australia, Belgium, Brazil, Canada, Germany, Netherlands, United Kingdom, and the United States. I am sure the meeting will afford an excellent opportunity to promote pleasant personal relationships and mutual respect and understanding among the participants from all the countries represented. The program of formal papers to be presented exceeds our fondest expectations. I am confident that this conference will be the best meeting ever held on the subject and it will be noted as a significant milestone in research. I hope that it will help to stimulate greater interest in this most important aspect of structural engineering.

I have intentionally made my remarks brief in order that you may get underway promptly. With this in mind, I would like now to introduce our keynote speaker for the conference.

Very often general officers get dubbed with nicknames that are colorfully descriptive of their personalities and exploits. We had a Mad Anthony, a Stonewall, a Blackjack, a Hap, and many more. It is no accident, in fact it is a compliment, our speaker this morning is called a

"Guinea Pig". The reason for this is that he operates on the working principle that the proper person to test a hypothesis (that might prove disastrous to the tester) is the originator of the hypothesis.

Since 1939 he has been subjecting himself to exciting and sometimes dangerous experiments. Early in his career he studied the effects of high altitude flight on man, he helped in the development of oxygen equipment, heated flying clothing, and night vision testers. During this early period he also exposed himself to explosive decompression. After World War II, he performed research on the effects of radioactivity on man. He was the first man to fly into nuclear clouds, immediately after bomb detonation, and proved that (for operational flying) it was safe to penetrate a cloud rather than have to fly around it. His research into radioactivity included experiments with tritium — breathing it, having it absorbed through his skin, and even drinking it. By way of making these experiments most meaningful, he devised a personal dosimeter or film tied on a long string which he swallowed as he passed in and out of the nuclear cloud. Upon landing the dosimeter was retracted and checked. In the course of his career he also found time to have published more than 80 technical articles in scientific journals.

Gentlemen, it is an honor to introduce to you an outstanding soldier-scientist, a Doctor of Medical Physiology and holder of a similar degree in Nuclear Physics, General Ernest A. Pinson, Commander of the Office of Aerospace Research.