History of the

Engineering Science and Mechanics Department

at

Virginia Polytechnic Institute & State University

The Frederick Years

1970 – 1989

by

Daniel Frederick

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

August 1989

This history of the ESM Department, covering the period 1970-89, was written and presented in a form which will allow additions and corrections to be made to it in a relatively easy way. Earlier and future periods of history may be added thus allowing one to have in one complete volume, a complete history of the Department.

Because this portion of the history was written in a very short time and under the pressure of a deadline, it surely contains errors and important omissions have inadvertently occurred. The author expresses sincere apologies for all errors and omissions. Readers are invited to send omissions and errors to the writer for subsequent revisions.

It is my intent that this brief history be enjoyable and interesting to each reader.

Sincerely,

Daniel Frederick

VIRGINIA TECH

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HISTORY OF THE ENGINEERING SCIENCE AND MECHANICS DEPARTMENT AT VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

THE FREDERICK YEARS (1970-1989)

by Daniel Frederick

I. Preface

At the time that I assumed the Headship on May 1, 1970, the national environment and outlook for engineering and technology was poor and depressing. The U.S. NASA space program was declining, the mood of college-age students was anti-establishment, anti-technology, and anti-engineering. Federal funds for the support of research in universities were dwindling steadily. The United States was trying to withdraw from the conflict in Viet Nam. Engineering enrollments were declining as were resources, faculty positions, and public support. News in the mechanics community was particularly depressing as announcements of the abolishments or combinations of mechanics departments with other departments at other universities were made frequently. In fact, the national environment for the existence of separate departments of mechanics was bad during my entire tenure, 1970-89, as Head. Separate departments of mechanics (many of which were distinguished) were either abolished or combined with another department at universities such as Georgia Tech, U. of Michigan, N.C. State, Tennessee Tech, West Virginia, Johns Hopkins, Alabama, and Michigan State. During my early years, several ESM faculty questioned whether we should continue to exist as a

separate department at VPI&SU. Others suggested that we consider discontinuing the B.S. degree program. Studies by prominent national organizations projected declining engineering enrollments for several years ahead. Several suggested that I was foolish to accept the Headship in such a deteriorating environment. My judgment was that all of the aforementioned hardships were challenges which could be met and overcome, and I viewed the Headship of the Engineering Mechanics Department at VPI&SU as one of the few jewels remaining in the United States. It was my judgment that the abolishment of all separate departments of mechanics in the nation would be bad for engineering education in the nation. In general, mechanics departments provided a foundation on which the entire college of engineering could grow. It was my strong conviction that the EM Department at VPI&SU could foster, grow and become one of the distinguished departments in the world and thus provide the leadership for the entire national engineering community. Thus, I began my tenure as Head.

Without a doubt, one of the most significant achievements during my tenure, was maintenance of the ESM Department as a separate department with a good steady growth with many significant achievements in many areas. From the beginning and throughout my Headship, the two main and equally important objectives of the department were teaching and research. Extension activities constituted a small percentage of the faculty's activities and some of these were associated with off-campus teaching. Upon hiring young Assistant Professors, without exception, they would ask, "which is most important to my advancement,

teaching or research?" I would always answer by saying that the word or should be replaced by and and that these two functions should be treated equally. As noted through our discussions with peers elsewhere, the ESM Department has achieved a stature as one of the top departments of its kind nationally and internationally. The greatest strengths of the department today are its outstanding faculty and students.

Although student evaluation of teaching did not formally exist in the 1960's thus rendering comparisons difficult, it is my judgment that the overall teaching effectiveness of the faculty did improve during my term in office. One measure of teaching effectiveness is the number of teaching awards achieved by the faculty. Among the teaching awards garnered by the faculty during my term in office were five Sporn Awards, four Wine Awards, five inductees into the Academy of Teaching Excellence, one SCHEV Outstanding Faculty Award, two ASEE AT&T Teaching Awards, and two Distinguished Educator Awards of the ASEE/Mechanics Division. Many Certificates of Teaching Excellence awarded through the College of Engineering have been received by ESM faculty members.

Another of the most significant achievements of the department has been in the development of the sponsored research programs and the productivity associated with it such as publications in journals and proceedings, textbooks, and the recognition of the research program through research awards and editorships. During the 1968-69 fiscal year, all of the sponsored research expenditures totaled $44,284. Following an almost steady monotonic growth year by year, the total

sponsored research expenditures reached an estimated $3,800,000 for the 1988-89 fiscal year on some 85 sponsored research projects. Through the years, the faculty has had an outstanding record of publications in refereed journals, proceedings, and books. The number of research awards bestowed upon the faculty by regional, national, and international professional organizations and VPI&SU has been outstanding. The record on VPI&SU Alumni Research Awards has been particularly impressive. Since its initiation in 1976, seven ESM faculty members have won these awards, which is the highest number, by far, of any department in the University. One faculty member received an ASEE/SE Outstanding Research Award and several faculty members have received research awards from technical societies such as the AIAA, SEM, and ASCE. In addition to the many honors which have been bestowed upon the faculty, they have been recognized by their peers through appointments as editors, members of editorial boards, etc. and by election to national offices and appointments to technical committees.

During the Frederick years, a number of honors were bestowed upon the faculty. Among these were the naming of two Alumni Distinguished Professorships, two University Distinguished Professorships and two named professorships.

At the B.S. level, the ESM undergraduate program was accredited by ABET for the maximum period of six years each time that it was up for accreditation (1971, 1977, and 1983). The material for the 1989 accreditation which will be

conducted during the 1989 Fall Semester was also prepared by the author of this history.

II. Names, Heads, and Locations

Courses in applied mechanics were offered at VPI&SU as parts of engineering programs as early as 1891. Predecessors to a separate department of mechanics were the Experimental Engineering Department (1908-14) and one in the Applied Mechanics and Experimental Engineering (1914-32). In 1932, courses and programs in mechanics were organized exclusively for the first time as the Department of Applied Mechanics (1932-60). In 1960, the name of the department was changed to Engineering Mechanics. The present name, Department of Engineering Science and Mechanics, was adopted in 1972.

In 1918, the Department of Applied Mechanics and Experimental Engineering was located in the basement of the First Academic Building which has since been razed. It was headed by Professor J. S. A. Johnson. The department handled all courses in mechanics, both solid and liquid, thermodynamics and heat engines. Machines for testing materials consisted of those for tension, compression, torsion and bending. A few years later, upon completion of a section of McBryde Hall (which was razed in 1967), the materials laboratory and lecture courses were taught in the building, and the equipment for the mechanical laboratory was moved to the old part of the power plant (now the print shop). In 1930-32, the part of McBryde Hall used by the department was turned over to the Ceramics Department, and the materials laboratory was moved to the part

originally occupied by the woodshop which was discontinued as a course. Lecture rooms and offices were then located in Patton Hall.

Following the death of Professor Johnson in 1931, the department was reorganized during the Spring of 1932. It was named the Department of Applied Mechanics and Dr. Louis O'Shaughnessy was appointed its head. Assigned to the department were all courses in solid and fluid mechanics. The one member of the previous staff handling courses in aeronautics was assigned to the Department of Applied Mechanics, but the field of aeronautics was shifted to the Department of Mechanical Engineering as an option.

Upon completion of Holden Hall in 1940, the offices and lecture classrooms of the department were moved to the second floor of that building while the materials laboratory remained in McBryde Hall. Professor D. H. Pletta was named head of the department in 1948. All offices, classrooms, and laboratories were moved to Norris Hall in 1962 upon completion of its second wing. Following Prof. Pletta's retirement as an administrator, Dr. Daniel Frederick was appointed to head the department on May 1, 1970 and served in this capacity until June 15, 1989. During the Frederick years, the main departmental office was located in Norris Hall as were most of the faculty and graduate student offices, and laboratories. However, because of a shortage of space some offices, laboratories, and classrooms were dispersed throughout the campus in buildings such as Holden, Patton, Randolph, Femoyer, Burruss and the Bull annex house.

Dr. Edmund G. Henneke was appointed to head the department on June 16, 1989. The department has been very fortunate that it has had only three Department Heads since it became a separate department in 1932, a period of 57 years, and each served a period of approximately two decades (16, 22 and 19 years, respectively). This has provided a certain degree of stability which was important in retaining separate departmental status.

III. Graduate and Undergraduate Degree Programs

Graduate courses have been offered in Engineering (or Applied) Mechanics at Virginia Polytechnic Institute and State University since it was first organized as a separate department in 1932. Prior to this date, it functioned primarily as a service department offering undergraduate courses in mechanics for students in other curricula. This graduate work was expanded considerably in 1946 when authorization was granted to offer the M.S. degree in this field. By 1951, the growth in available graduate courses had progressed enough so that work on a Ph.D. level could be started. Since 1947, a total of 541 Master's degrees have been earned; the number of doctorates awarded beginning in 1954 now totals 282. The M.S. (non-thesis option) and Master of Engineering degrees were approved and initiated in 1972. Up until 1960, all graduate degrees carried the designation Applied Mechanics. After 1960, their designations were changed to Engineering Mechanics.

Of those who have received graduate degrees in Engineering Mechanics at VPI&SU so far, about 20% are engaged in college teaching in universities, and 75% are in governmental or industrial research and development laboratories. Many of the graduates hold responsible positions ranging up to department head, project manager, research director, or dean.

An effort was made to accelerate and strengthen the program even further by starting an undergraduate curriculum in Engineering Mechanics in 1956. This

course of study followed the suggestions outlined in the ASEE Report on Evaluation of Engineering Education, especially with regard to emphasis on mathematics and the basic and engineering sciences. The undergraduate degree was first accredited by ECPD in 1958 and accreditation has been achieved continuously since then. It is significant to note that the Engineering Mechanics undergraduate curriculum at VPI&SU was the third in the United States to be accredited by the ECPD. The first one accredited was the program at the University of Michigan in 1937 and the second was at Purdue University in 1950. Of the 581 persons who were awarded the B.S. degree so far, more than one-half have taken or are pursuing graduate work. With the departmental name change in 1972, all undergraduate degrees were designated Engineering Science and Mechanics; however, all graduate degrees continued to carry the title Engineering Mechanics.

Table I (next page) presents data on enrollments and degrees conferred since the 1969-70 academic year to illustrate the periods of growth and decline.

Of all the degrees awarded throughout the history of the department, 73% (422 of 581) of all B.S. degrees, 63% (341 of 541) of all M.S. degrees, and 71% (199 of 282) of all Ph.D. degrees were awarded during my term as Head. Many of our graduates at all degree levels hold high responsible positions in industry, government, and academia. One fact of which I am especially proud is that an unusually high number of our Ph.D. graduates hold faculty positions in universities. It is also worthy to note that aside from the Doctor of Education and

Doctor of Veterinary Medicine degrees, the Engineering Science and Mechanics Department has awarded more Doctor of Philosophy degrees than any other department at VPI&SU throughout the history of the University. ESM has been a leader in graduate education in the College and University.

Table 1. Degrees Awarded and Enrollments

Academic Year	Degrees Awarded			Enrollments	
	BS	MS	PhD	Undergraduate	Graduate
1969-70	15	4	10	59	49
1970-71	14	4	9	60	54
1971-72	13	10	4	55	61
1972-73	16	12	7	48	63
1973-74	7	14	15	35	54
1974-75	15	14	13	52	53
1975-76	13	8	8	54	58
1976-77	9	17	6	68	60
1977-78	19	10	9	75	61
1978-79	18	16	12	93	68
1979-80	10	15	9	95	73
1980-81	29	14	5	135	76
1981-82	27	19	9	138	84
1982-83	33	25	10	153	102
1983-84	31	21	17	167	105
1984-85	47	25	7	182	111
1985-86	37	24	13	165	122
1986-87	37	29	13	157	165
1987-88	29	36	13	88	163
1988-89	18	28	20	69	165

It may be noted that during the early and middle 1970's, enrollments at the undergraduate and graduate levels were not as high as were desired. One of our objectives, at the time, was to graduate about 25 students at the B.S. level, and a second objective was to achieve a graduate student/faculty ratio of approximately 3:1. However, because of the factors mentioned in the PREFACE such as the anti-technology attitude of students, and the reduced financial support for education and research by the federal government and industry, it was not possible to achieve these goals until the 1980's.

The ESM Department at VPI&SU has had good relationships with the NASA Langley Research Center in Hampton, VA throughout its history. As a result, during the 1950's and 1960's, a large number of NASA employees were sent to VPI&SU with pay to earn a graduate degree. Many of these graduates now hold important administrative and research positions at NASA Langley or have, by now, chosen to retire. They all made significant contributions to the U.S. space and aeronautics program. However, beginning in the early 1970's, with the decline of America's space effort and the establishment of a graduate center at NASA-Langley by George Washington University, the number of NASA employees who came to the ESM Department to earn a graduate diminished to almost zero. Thus, one of my earliest challenges was to recruit and enroll graduate students to fill the void caused by the drop-off of NASA students. This required a significant portion of my time and effort. Many visits were made to other universities without

significant graduate programs, personal contacts were increased and intensified, numerous phone calls were made to prospective students, calls were made to faculty colleagues at other universities to assist in this effort, and a variety of other tactics were employed. As an example, I spent many hours in trying to locate an ROTC program at a nearby college (Wake Forest, W&L, etc.) in which a potential graduate student wanted to enroll. If he could enroll in an ROTC program nearby he would enroll at VPI&SU, if not, he would go elsewhere. At the time the VPI&SU ROTC program would not allow him to enroll because he was a graduate student. Through considerable help from the faculty we were able to maintain the graduate enrollment in the range 53-63 from 1970 to 1978. Since 1978, as the faculty and department became more distinguished, graduate enrollments climbed steadily to the level of 165 in 1989. During the past several years the department would receive about 225 applications per year and admit perhaps 50-60 each year. Thus, the quality of the graduate student body improved each year as enrollments grew. However, as at most other universities, the percentage of international students increased to the current level of about 50%. In ESM, the graduate students come from many countries throughout the world.

IV. Sponsored Research Program

The sponsored research program grew from modest levels of expenditures through the 1960's (research expenditures stood at $44,284 during the 1968-69 fiscal year – July 1, 1968 to June 30, 1969) to levels above $3,500,000 per year in the late 1980's, ranking the ESM Department as one of the top research departments in the nation. See Table II for yearly figures. Of the 165 graduate students enrolled in 1988-89, approximately 90 received financial support in one form or another from one or more of the 85 sponsored research projects. As is well known in the educational community nationally, public land grant universities provide only a small fraction of the assistantships needed to support a healthy, productive engineering graduate degree program. Hence, it is incumbent upon the faculty of an engineering department to seek outside sponsored research projects to support their graduate students. The ESM faculty, as a group, has been most successful in this endeavor. It must be remembered that ESM faculty members at VPI&SU are in competition nationally with faculty members at distinguished engineering colleges such as those at MIT, Stanford, Michigan, and Illinois.

During 1968, seven ESM faculty members and one from CE worked together to prepare a research proposal to the Department of Defense under its Project THEMIS program. This THEMIS project which I coordinated and administered was most successful. This interdisciplinary project ran from July 1, 1969 to December 31, 1975 with DOD funding of $748,000. At the time it was the

largest single research project ever funded at VPI&SU. According to reports from DOD it was also one of the most successful. Some 10 faculty members and about 25 graduate students worked cooperatively to perform research which resulted in 65 papers being published in refereed journals. It provided the foundation for the large and successful research program in composites at VPI&SU now coordinated through the Center for Composite Materials and Structures. At the conclusion of the six and one-half year project, all expenditures were within $3 of the allocated funds.

More recently, several ESM faculty members have been engaged in large interdisciplinary research projects. Among these are the Virginia Institute for Materials Systems established as a Virginia Commonwealth Center at about $600,000 per year directed by Reynolds Metals Professor Reifsnider; as part of a DOD URI Center on Composites at the U. of Illinois subcontracted to VPI&SU with Professor Daniel Post as Director; and the NSF Science and Technology Center on Composites and Adhesives - $8,000,000 over five years in which six ESM faculty members are participating (Reifsnider, Henneke, Morton, Loos, Czarnek, and Dillard).

As may be seen from Table II, the research expenditures increased almost steadily year by year to the 1988-89 expenditures estimated to be about $3,800,000. For the nineteen years of the Frederick period, a total of $34,528,000 was expended for sponsored research which gives an average of $1,877,000 per

year over the entire period. This is indeed a remarkable record. In fact, it may be the highest of all departments in the University over the same period of time.

Table II. Sponsored Research Expenditures

FISCAL YEAR	TOTAL EXPENDITURES	NUMBER OF PROJECTS
1968-69	$ 44,284	
1969-70	269,000	
1970-71	339,000	11
1971-72	384,000	
1972-73	736,497	
1973-74	703,479	
1974-75	882,904	
1975-76	1,053,245	35
1976-77	1,164,000	
1977-78	1,111,000	36
1978-79	1,465,000	
1979-80	1,415,000	
1980-81	1,571,900	
1981-82	1,858,400	
1982-83	2,196,000	60
1983-84	2,465,695	
1984-85	2,672,500	
1985-86	3,448,622	
1986-87	3,690,639	
1987-88	3,570,555	
1988-89	3,800,000*	85

*Estimated

Many awards and recognitions were bestowed upon the ESM faculty as a result of their achievements in research and scholarship. Many of the external awards are listed in the section on FACULTY AWARDS. Listed below are the seven ESM faculty members who have received a VPI&SU Alumni Research Award since its founding in 1975.

VPI&SU Alumni Research Award Winners

C. W. Smith	1977
L. Meirovitch	1981
K. L. Reifsnider	1982
W. S. Saric	1984
J. N. Reddy	1985
H. F. Brinson	1988
Daniel Post	1989

V. Teaching Program

During the period 1970-89, the ESM Department was committed to excellence in teaching. Beginning with the 1970-71 academic year and continuing every year through the 1988-89 year, the department conducted an effective teaching program on ways to improve the effectiveness of the teaching/learning process. This program was required for all new faculty members and was optional for all graduate students intending to pursue teaching as a career. It consisted of several half-day sessions prior to the beginning of the fall term followed by individual assistance as needed throughout the year. It was conducted by two or three of the best ESM teachers (usually Sporn and Wine Award Winners) with the most recent Sporn or Wine Award winner as chairman. A significant effort was made to ensure good student-teacher rapport both in formal classroom lectures and in informal learning situations such as research tasks. Continuation of the traditional "open door" policy resulted in easy student access to professors.

Through the years, the ESM faculty has experimented with new methods of teaching which were aimed at improving the teaching learning process. In the early 1970's some experimentation with self-paced instruction was completed. However, the results showed no significant differences between the self-paced approach and the standard lecture method either in terms of student achievement or instructional effort. Following some experimentation with other methods of teaching, the faculty almost unanimously favored the traditional lecture/problem

solving approach for teaching courses in mechanics. An educational lab, containing experimental demonstrations appropriate to two basic mechanics courses was maintained by the department for several years in the mid 1970's but was discontinued due to a shortage of space. The department did make available a number of portable demonstration devices for use in the classroom, and it maintained a good library of short and long films and video tapes.

Efforts to improve educational techniques included the creation and production of educational movie films on the "Mechanics of Materials and Structures," "Strength of Materials Laboratory," and "A World of Structures" by Professor Robert Heller. This series of 16mm sound films, available through McGraw-Hill Book Co., has found wide adoption throughout the world, and has substantially enhanced the students understanding of the use of fundamental principles of mechanics in structural design.

Beginning with the 1984-85 academic year, each freshman in the College of Engineering has been required to purchase and own an IBM PC. With the advent of the PC program every student in the freshman and sophomore ESM courses was required to do several homework exercises using the PC. In 1986, Professor L. G. Kraige was successful in obtaining a grant from the Virginia State Council of Higher Education on "Development of Visual and Computational Exercises in the Engineering Sciences by Computer Animation." The computer programs developed under this project are being used in the ESM service courses and are available nationwide.

Because of the high teaching loads imposed upon the department in the 1976-77 year, the faculty began to teach classes in the 50-60 student range, and the results were good. Up until that year, class sizes were held to approximately 35 students or less. Class sizes began to increase until they reached the 175-200 student size in the early 1980's. In 1988-89, the department taught a variety of class sizes from 175-200, 100-200, 60-80, and many smaller than 40-45 students. It was always my judgment that the quality of the teaching/learning process deteriorated as class sizes increased. Special help sessions were always provided for those students who required additional instruction in the basic service courses. In general, and with some exceptions, it was the policy of the department to have all regular lecture classes taught by regular faculty in the ranks of Instructor or higher. Graduate teaching assistants were used almost exclusively to assist the regular faculty in performing their teaching duties and to provide assistance by grading papers, developing homework exercises, setting up laboratory experiments, developing computer software, and conducting question and answer sessions.

Through the years the ESM Department has had a good reputation for excellence in teaching. Recognition of the teaching effectiveness is in part reflected by the teaching awards made to the ESM faculty and by other forms of recognition. These were summarized briefly in the PREFACE and are presented on the next page in detail for the 1970-89 period.

SPORN AWARD WINNERS

J. E. Kaiser	1971
W. W. Stinchcomb	1975
L. G. Kraige	1978
R. M. Goff	1982
D. H. Morris	1989

WINE AWARD WINNERS

R. P. McNitt	1972
J. E. Kaiser	1975
L. G. Kraige	1984
D. J. Schneck	1987

ACADEMY OF TEACHING EXCELLENCE INDUCTEES

R. P. McNitt	1974
J. E. Kaiser	1975
A. H. Nayfeh	1976
L. G. Kraige	1984
D. J. Schneck	1987

ASEE DOW YOUNG ENGINEER'S AWARD

J. E. Counts	1970

FRANK J. MAHER OUTSTANDING EDUCATOR AWARD

F. J. Maher	1979	W. W. Stinchcomb	1984
R. P. McNitt	1980	D. T. Mook	1985
C. W. Smith	1981	C. T. Herakovich	1986
R. A. Heller	1982	K. L. Reifsnider	1988
E. G. Henneke	1983	D. H. Morris	1989

SCHEV OUTSTANDING EDUCATOR IN VIRGINIA AWARD

L. G. Kraige	1988

ASEE/SE WESTERN ELECTRIC FUND AND AT&T AWARDS

R. A. Heller	1982 (Western Electric Fund)
L. G. Kraige	1988 (AT&T)

VI. Faculty

Without any question, the two most important components of an academic department are its faculty and students. With an excellent and innovative faculty, almost all other problems may be overcome. Through the years, the ESM Department had been blessed with excellence in both groups.

Upon assuming the Headship in May 1970, the department had an allocation of 20 teaching positions founded on state funds. As student enrollments and the sponsored research funding grew, the number of faculty positions increased to the 43-45 level in recent years. The latter figures included both teaching and research positions. In the Fall Semester of 1988, there were 38.5 state teaching positions allocated to the department.

The first faculty member hired by me was Professor A. H. Nayfeh at the beginning of the 1971 Spring Quarter. At the beginning of the 1971 Fall Quarter four additional faculty members were hired: Assistant Professors E. G. Henneke, II, B. W. Schaaf, L. W. Wittig, and Professor L. Meirovitch. Ed Henneke rose through the ranks and was appointed ESM Department Head on June 16, 1989. Ali Nayfeh and Len Meirovitch are currently University Distinguished Professors. Larry Wittig, who earned his Ph.D. at MIT, had strong ties in the New England area and returned there to pursue his professional career, and Barry Schaaf, unfortunately, was stricken with a ruptured aneurysm in his brain and was unable to continue working.

Listed below are the faculty who held appointments at the rank of Assistant Professor and above in each of the years (1971, 1977, 1983, 1988*) in which the ABET (or ECPD) inspections were held. The exception(*) is the 1988 year—obviously, it was used instead of the Fall of 1989 when the ABET inspection was held, because I was not the Department Head in the Fall of 1989. In addition to the faculty listed below, the ESM Department appointed many persons in the ranks of Instructor, Research Associate, Lecturer, Visiting Professor, Visiting Scientist, etc. The numbers in such appointments, many of who were appointed for only one quarter, ran into the hundreds. I wish to express sincere appreciation to each person in these ranks for the contributions which they made to the department. However, because of their large numbers, it was not practicable to list these individuals.

Faculty of the ESM Department

(Fall Quarter 1971)

University Professor: Dan H. Pletta

Professors: D. Frederick, R. A. Heller, F. J. Maher, L. Meirovitch, A. H. Nayfeh, C. W. Smith, J. H. Sword

Associate Professors: H. F. Brinson, J. Counts, C. T. Herakovich, V. Maderspach, R. P. McNitt, A. A. Pap, K. L. Reifsnider, G. W. Swift

Assistant Professors: E. G. Henneke, II, J. E. Kaiser, D. T. Mook, B. W. Schaaf, W. W. Stinchcomb, C. W. Stormont, H. W. Tieleman, L. W. Wittig

(Fall Quarter 1977)

Alumni Distinguished Professor: Daniel Frederick

University Distinguished Professor: A. H. Nayfeh

Professors: H. F. Brinson, R. A. Heller, C. T. Herakovich, F. J. Maher, R. P. McNitt, L. Meirovitch, K. L. Reifsnider, C. W. Smith, J. H. Sword

Associate Professors: E. G. Henneke, II, J. E. Kaiser, Jr., V. Maderspach, D. T. Mook, A. A. Pap, W. S. Saric, D. J. Schneck, W. W. Stinchcomb, G. W. Swift, D. P. Telionis, H. W. Tieleman

Assistant Professors: K. L. Frair, E. R. Johnson, M. P. Kamat, O. A. Kandil, L. G. Kraige

(Fall Quarter 1983)

Alumni Distinguished Professors: D. Frederick, C. W. Smith

University Distinguished Professors: L. Meirovitch, A. H. Nayfeh

Professors: H. F. Brinson, R. A. Heller, E. G. Henneke, II, C. T. Herakovich, T. Herbert, R. M. Jones, J. L. Junkins, M. P. Kamat, D. T. Mook, D. H. Morris, D. Post, J. N. Reddy, D. J. Schneck, M. P. Singh, W. W. Stinchcomb, J. H. Sword, D. P. Telionis, H. W. Tieleman

Associate Professors: N. E. Dowling, J. C. Duke, M. W. Hyer, L. G. Kraige, V. Maderspach, A. A. Pap, G. W. Swift

Assistant Professors: H. Baruh, M. S. Cramer, H. P. Day, J. E. Dunn, K. L. Frair, R. M Goff, J. W. Grant, S. L. Hendricks, A. C . Loos, I. Sahin, C. Thompson

(Fall Semester 1988)

Alumni Distinguished Professors: D. Frederick, C. W. Smith

University Distinguished Professors: L. Meirovitch, A. H. Nayfeh

Clifton C. Garvin Professor: J. N. Reddy

Reynolds Metals Professor: K. L. Reifsnider

Professors: N. E. Dowling, R. A. Heller, E. G. Henneke, II, M. W. Hyer, R. M. Jones, L. Librescu, D. T. Mook, D. H. Morris, J. Morton, D. Post, D. J. Schneck, M. P. Singh, W. W. Stinchcomb, J. H. Sword, D. P. Telionis, H. W. Tieleman

Associate Professors: M. S. Cramer, D. A. Dillard, J. C. Duke, J. W. Grant, O. H. Griffin, Jr., S. L. Hendricks, L. G. Kraige, A. C. Loos, A. A. Pap, S. A. Ragab, G. W. Swift

Assistant Professors: R. Czarnek, Z. Gurdal, M. A. Norris, S. Thangjitham

Many faculty who served during the Frederick years were attracted to other positions in universities, industry, and government. Some became Department Head, Distinguished Professor, Branch and Division Administrators, etc. However, because all the institutions (and titles) to which these persons moved are not known, it appeared to be unfair to attempt a partial listing. Thus, such a partial list of departed faculty members was not attempted.

Retirements. Only four faculty members retired completely from VPI&SU during the period 1970-89. Each gave long faithful service to VPI&SU and as a group gave VPI&SU over 155 years of outstanding service.

University Distinguished Professor Dan H. Pletta retired from VPI&SU at the end of the 1971-72 academic year. He first joined VPI in 1932, gave four years of military service in World War II, and served 22 years as Head of the ESM

Department. He didn't really retire from work (he simply was no longer on the VPI payroll) for he continued to hold an office in the department (up to the present) and continues to make professional contributions to organizations such as the NSPE, VSPE, ASCE, and ASEE. In 1988, he received the prestigious Ruffner Medal from VPI&SU. He continues to reap other awards, among these were Honorary membership in ASCE, and the Distinguished Service Award of NSPE.

Professor Frank J. Maher retired at the end of the 1978 Fall Quarter. In his honor, the Frank J. Maher Award for excellence in education is awarded annually to an ESM faculty member. In a newspaper story on his retirement, he described his career at VPI as "one big highlight" and "I've done a little research, obtained a little funding, tested a few bridges and buildings, sung a little, and shot a few grouse." Frank was honored with a Wine Award and the ASEE Western Electric Fund Award for effective teaching.

Associate Professor Victor Maderspach retired at the end of the 1987 summer school after 30 years of service. His field of technical expertise was the theory of shells. He did consulting work in this area and had some of his work published. At his retirement, he was presented video tapes for learning the Spanish language, and a prestigious textbook Flachentragwerke by K. Girkmann was presented to the Newman Library in his honor.

Professor J. Howard Sword retired form VPI&SU on June 30, 1989 after 38 years of service to VPI&SU, 16 years of which were as Assistant Department Head. In his honor, the James H. Sword Award for the most outstanding senior

project in computational mechanics was established. Howard was also a recipient of the Wine Award. In his earlier years, he was affectionately known by the students as the “Swinging Sword” (presumably because he used to mow them down with a large number of “F” grades).

VII. Faculty Scholarship

One of the important measures of the stature of a department is the scholarly output of its faculty. Scholarship includes all publications such as refereed journal papers, proceedings papers, textbooks, monographs, research reports, book reviews, short notes and the like. Peers at other institutions judge a department's scholarship in terms of the significance of the research, its seminal nature, as well as its quantity. The ESM faculty has had a long history of productive continuous scholarship. Because of the large number of papers, reports, etc. (certainly well into the thousands), it is not possible to list all publications in this history. Therefore, I have chosen to list only textbooks written by ESM faculty members who served during the period 1970-89 because, in general, they tend to be more visible and are perhaps better known to the alumni. However, the more significant contributions in advancing the frontiers of knowledge were likely to have been made through the research papers. Listed below in abbreviated form are textbooks written by ESM faculty members who served on the ESM faculty during my tenure. The books may have been written prior to 1970.

Textbooks Authored by ESM Faculty

Continuum Mechanics, Allyn and Bacon, by D. Frederick and T. S. Chang

Structure in Architecture, Prentice Hall, by M. G. Salvadori and R. A. Heller

Mechanics of Composite Materials, Hemisphere Publishing, by R. M. Jones

Engineering Mechanics: Statics and Dynamics, John Wiley, by J. L. Meriam and L. G. Kraige

Engineering Mechanics: Statics and Dynamics (SI Version), John Wiley, by J. L. Meriam and L. G. Kraige

Elasto-Statics and Kinetics of Anisotropic and, Heterogeneous Shell-Type Structures, Martinus Nijhoff, by L. Librescu

Statics and Kinetics of Anisotropic Shells and Plate-Type Structures, Romanian Academy of Sciences Publishers, by L. Librescu

Analytical Methods in Vibrations, Macmillan Co., by L. Meirovitch

Methods of Analytical Dynamics, McGraw-Hill, by L. Meirovitch

Elements of Vibration Analysis, McGraw-Hill, by L. Meirovitch

Computational Methods in Structural Dynamics, Nijhoff Noordhoff, by L. Meirovitch

Introduction to Dynamics and Control, John Wiley, by L. Meirovitch

Nonlinear Oscillations, Wiley-Interscience, by A. H. Nayfeh and D. T. Mook

Perturbation Methods, Wiley-Interscience, by A. H. Nayfeh

Introduction to Perturbation Techniques, Wiley-Interscience, by A. H. Nayfeh

Problems in Perturbations, Wiley-Interscience, by A. H. Nayfeh

Variational Methods in Theoretical Mechanics, Springer-Verlag, by J. T. Oden and J. N. Reddy

A Mathematical Theory of Finite Elements, John Wiley, by J. T. Oden and J. N. Reddy

Advanced Engineering Analysis, John Wiley, by J. N Reddy and M. L. Rasmussen

An Introduction to the Finite Element Method, McGraw-Hill, by J. N. Reddy

Energy and Variational Methods in Mechanics, John Wiley, by J. N. Reddy

Applied Functional Analysis and Variational Methods in Engineering, McGraw-Hill, by J. N. Reddy

Engineering Principles of Physiologic Function, New York Univ. Press, by D. J. Schneck

Unsteady Viscous Flow, Springer Verlag, by D. P. Telionis

Optimal Estimation of Dynamical Systems, Noordhoff Int., by J. L. Junkins

Engineering Mechanics: Statics and Dynamics, Ronald Press, by D. H. Pletta and D. Frederick

Structural Optimization, Martinus Nijhoff, by R. T. Hafka, Z. Gurdal, and M. P. Kamat

Optimal Spacecraft Rational Maneuvers, Elsevier Publishers, by J. L. Junkins and J. D. Turner

The Engineering Profession: Its Heritage and Its Emerging Public Purpose, University Press of Americas, by D. H. Pletta

Elements of Structural Optimization, Martinus Nijhoff Publishers, by R. T. Hafka and M. P. Kamat

VIII. Faculty Awards, Honors, Officers, and Editorial Positions

In recognition of its outstanding contributions in teaching, research, scholarship, and leadership, the ESM faculty has been recognized at the national and international levels through many awards, honors, and election to leadership positions. Recognition has also been received through Editorships, Associate Editorships, and Editorial Boards of national and international research journals and proceedings and through election as officers of technical professional societies. At VPI&SU, in addition to the distinguished and named professorships, seven Alumni Research Awards, five Sporn Awards, four Wine Awards, and other VPI&SU recognitions listed previously in the sections on Research and Teaching, ESM faculty members have been recognized locally in many ways. These other VPI&SU recognitions are not listed in the interest of conserving space and brevity. Therefore, only regional, national, and international recognitions are listed.

Awards and Honors

Honorary Doctor of Science University of Brussels, Belgium	H. F. Brinson
Fellow, American Society of Nondestructive Testing	J. C. Duke & E. G. Henneke
Distinguished Educator Award, ASEE/Mechanics Division	Daniel Frederick & D. H. Pletta
Fellow, American Academy of Mechanics	Daniel Frederick, Ali H. Nayfeh, & J. N. Reddy
Ralph R. Teeter Award Society of Automotive Engineering	J. C. Duke, Michael Hyer, & J. N. Reddy
NASA Cash Award for NASA Tech Brief	Michael W. Hyer & M. P. Kamat
Laureate of Prize “Traian Vuia” Romanian Academy of Sciences	Liviu Librescu
Fellow of AIAA	Leonard Meirovitch
AIAA Pendray Aerospace Literature Award	Leonard Meirovitch
AIAA Structures, Structural Dynamics and Materials Award	Leonard Meirovitch
Kuwait Prize in Basic Sciences (Physics)	Ali H. Nayfeh
Research Award, Yarmouk University	Ali H. Nayfeh
Alexander von Humboldt Foundation Award	Ali H. Nayfeh, M. P. Kamat, & J. N. Reddy
G. H. Duggan Medal from Canadian Society of Mechanical Engineers for best paper	Marek J. Pindera with two co-authors

Distinguished Service Award NSPE	D. H. Pletta
William H. Ruffner Medal, VPI&SU	D. H. Pletta
Engineer of the Year Award, VSPE	D. H. Pletta
Honorary Member ASCE	D. H. Pletta
Fellow, Society for Experimental Mechanics (SEM)	H. F. Brinson, Daniel Post, & C. W. Smith
The William Murray Lectureship, SEM	Daniel Post
M. M. Frocht Award, SEM	Daniel Post & C. W. Smith
Distinguished Contribution Award, SEM	Daniel Post
Tatnal Award, SEM	H. F. Brinson
Royal Society of London Award	Daniel Post (with C. Ruiz)
ASCE Walter L. Huber Research Award	J. N. Reddy
Fellow, American Society of Mechanical Engineers	J. N. Reddy
J. Shelton Horsley Award Virginia Academy of Science	K. L. Reifsnider
Fellow, American Society for Testing and Materials (ASTM)	K. L. Reifsnider
Award of Merit ASTM	K. L. Reifsnider
NASA Exceptional Scientific Achievement Award	C. W. Smith
ASEE/SE Research Award for Best Paper	D. P. Telionis
AIAA Mechanics and Control of Flight Award	J. L. Junkins

American Astronautical Society Distinguished Service Award and Fellow	J. L. Junkins
Celestial Mechanics Institute Distinguished Service Award	J. L. Junkins
Fellow, American Physical Society	T. Herbert, A. H. Nayfeh, & W. S. Saric
Dupont Young Faculty Award	D. G. Baird

Editorial Positions

Int. J. for Composite Structures	Advisory Board, H. F. Brinson
Adhesion Science Review	Co-Editor, H. F. Brinson
J. of Adhesion Science & Technology	Advisory Board, H. F. Brinson
Experimental Mechanics	Assoc. Technical Editor, D. A. Dillard & D. H. Morris
J. of Engineering Materials and Technology, ASME	Associate Editor, Norman E. Dowling
J. of Fatigue of Engineering Materials and Structures	Editorial Board, Norman E. Dowling
Proceedings of Eighth Southeastern Conference on Theoretical and Applied Mechanics (SECTAM)	Editor, Daniel Frederick
Probabilistic Aspects of Fatigue, ASTM STP 511	Editor, R. A. Heller
Thermal Stresses in Severe Environments, Plenum Press	Co-Editor, R. A. Heller

Materials Evaluation, ASNT	Assoc. Tech. Editor, E. G. Henneke
Proceedings of Fifth SECTAM	Co-Editor, E. G. Henneke
Proceedings of Sixth SECTAM	Co-Editor, E. G. Henneke
J. of the AIAA	Assoc. Editor, R. M. Jones
J. of Astronautical Sciences	Assoc. Editor, J. L. Junkins
Map Projection Methods, Sigma Scientific Publishers	Editor, J. L. Junkins
Solid Mechanics Archives	Editorial Board, L. Librescu
Journal de Mecanique Theorique et Appliquee, France	Editorial Board, Leonard Meirovitch
Mechanics: Dynamical Systems, Martinus Nijhoff	Editor, Leonard Meirovitch
J. of Optimization Theory and Applications	Assoc. Editor, Leonard Meirovitch
J. of Spacecraft and Rockets	Assoc. Editor, Leonard Meirovitch & J. L. Junkins
Proceedings of the VPI&SU/AIAA Symposium on Dynamics and Control of Large Flexible Spacecraft, (1^{st}, 2^{nd}, & 3^{rd})	Editor, Leonard Meirovitch
Proceedings of the VPI&SU/AIAA Symposium on Dynamics and Control of Large Structures (4^{th}, 5^{th}, 6^{th})	Editor, Leonard Meirovitch

Int. J. for Numerical Methods in Engineering	Editorial Board, J. N. Reddy
Int. J. for Numerical Methods in Fluids	Editorial Board, J. N. Reddy
J. of Engineering Computation	Editorial Board, J. N. Reddy
Int. J. of Non-Linear Mechanics	Editorial Board, J. N. Reddy
J. of Computers and Structures	Editorial Board, J. N. Reddy
Fatigue of Filamentary Composite Materials ASTM STP 636	Co-Editor, K. L. Reifsnider
Mechanics of Nondestructive Testing, Plenum Press	Co-Editor, K. L. Reifsnider
Damage in Composite Materials: Basic Mechanisms, Accumulation, Tolerance, and Characterization	Co-Editor, K. L. Reifsnider
Composites Technology Review	Chm. Editorial Board, K. L. Reifsnider
J. of Testing and Evaluation	Editorial Board, K. L. Reifsnider
J. of Annals of Biomedical Engineering	Editorial Board, D. J. Schneck
J. of Clinical Engineering	Editorial Review Board, D. J. Schneck
Proceedings of the First Mid-Atlantic Conference on Bio-Fluid Mechanics	Editor, D. J. Schneck
Biofluid Mechanics, Plenum Press	Editor, D. J. Schneck

Fracture Mechanics, ASTM STP 677	Editor, C. W. Smith
Fracture Mechanics, ASTM STP 909	Co-Editor C. W. Smith
Int. J. of Fracture Mechanics Technology	Regional Editor, C. W. Smith
Nondestructive Evaluation and Flaw Criticality for Composite Materials, ASTM STP 696	Co-Editor, W. W. Stinchcomb
Mechanics of Nondestructive Testing, Plenum Press	Editor, W. W. Stinchcomb Assoc. Editor, J. C. Duke
J. of Fluid Engineering, ASME	Assoc. Editor, D. P. Telionis
Mechanics, American Academy of Mechanics	Editor, J. H. Sword
J. of Composite Materials	Editorial Board, C. T. Herakovich

Officers

Society for Experimental Mechanics	President H. F. Brinson
American Academy of Mechanics	President Daniel Frederick
Society of Engineering Science	President Daniel Frederick
Association of Chairmen of Departments of Mechanics	President Daniel Frederick
Virginia Center for Innovative Technology (Materials)	Chairman Carl Herakovich
Virginia Section, ASCE	President D. H. Pletta

National Society of Professional Engineers	Vice-President D. H. Pletta
Virginia Society of Professional Engineers	President D. H. Pletta
Biomedical Engineering Society	President-Elect Daniel J. Schneck

IX. Distinguished and Named Professorships

In 1969 there were no distinguished or named professorships in the ESM Department. In fact, the distinguished professorships (University and Alumni) were not established at VPI&SU at that time and most of the named and chaired professorships were established after that date, also. In 1989, there were six such professorships which is a measure of the distinguishability achieved by the faculty. Two other named professorships (Herrick and Harrison) were established during my tenure but are not yet filled. Listed below are the 1989 holders of these professorships and the year in which he achieved the position.

Daniel Frederick	Alumni Distinguished Professor	(1974)
Ali H. Nayfeh	University Distinguished Professor	(1975)
C. W. Smith	Alumni Distinguished Professor	(1980)
Leonard Meirovitch	University Distinguished Professor	(1983)
Kenneth L. Reifsnider	Reynolds Metals Professorship	(1983)
J. N. Reddy	Clifton D. Garvin Professorship	(1985)
D. H. Pletta	University Distinguished Professor Emeritus	(1972)
Open	Waldo Harrison Professorship	
Open	Samuel Herrick Professorship	

Dan H. Pletta, who served as Head of the Department from 1948 to April 30, 1970, was named University Distinguished Professor in 1970. However, he retired from VPI&SU and is now University Distinguished Professor Emeritus.

X. Students

The department has been fortunate throughout the years to have attracted excellent students at both the undergraduate and graduate levels. This has provided a major strength for the department in developing its teaching and research programs. Upon earning their degrees, these students have brought recognition to the department through their professional contributions as alumni. Because of the lack of information, it is not possible to list their achievements after graduation. Instead an attempt will be made to list some of their major achievements as students while at VPI&SU.

Undergraduate Students. Many of our undergraduates graduated with high academic honors such as *cum laude, magna cum laude, summa cum laude,* and *in honors* and were initiated into honorary societies such as Tau Beta, Phi Kappa Phi, Omricon Delta Kappa. Many belonged to student chapters (and held offices) of professional organizations with student chapters on the VPI&SU campus. Among these were the Society of Engineering Science, Society for Experimental Mechanics, and the Biomedical Engineering Society. Through the years many undergraduate students belonged to the ESM Society which provided social as well as technical activities. In many years, the ESM Society held an annual picnic at which the students would challenge the faculty in some sporting activity such as touch football and softball. Of course, with most of the contests being held just before graduation, the faculty almost always won.

It seems appropriate in this history to list all of the seniors who were chosen for the Dan H. Pletta Award for the most outstanding senior project. In order to meet ABET requirements for a B.S. degree in engineering, all seniors are required to complete a senior project, and the award was established to honor Dan H. Pletta who served as Head of the ESM Department during 1948-70.

Dan H. Pletta Award Winners

Edgar J. Young	1971-72
David K. Barrett	1972-73
Charles L. Ellington	1973-74
Glenn F. Rogers	1974-75
David F. Thrasher	1975-76
Jeffrey G. Larson	1976-77
Eugene T. Camponeschi, Jr.	1977-78
Daniel J. Mook	1978-79
William A. Baracat & Norm F. Black	1979-80
Michael F. Fitzpatrick	1980-81
Jeffrey K. Bennighof	1981-82
Roy W. Henk	1982-83
Mark T. Kirk	1983-84
William W. Sisson	1984-85
Russell K. Kemp	1985-86
Kathryn E. Saatman	1986-87
Roland Y. Kim & Harold L. Neal, Jr.	1987-88
Tariq A. Nayfeh	1988-89

Some other notable achievements by ESM undergraduate students are mentioned here. However, because of incomplete records in many student files, it was not possible to list all such achievements.

In 1989 *Tariq A. Nayfeh* was a winner of a Sigma Xi Award for outstanding undergraduate research. During the same year, an ESM junior *William S. Kohl* was awarded the Paul E. Torgersen (Dean of Engineering) Leadership Scholarship for his senior year. *Harold L. Neal, Jr.*, in 1988, was selected for an ONR Doctoral Fellowship in competition with students nationwide. This fellowship provides full coverage of all expenses for three years while Harold studies toward the Ph.D. degree at VPI&SU. *Carolyn M. Anderson* received the 1988 Frank Loria Award for outstanding performance in academics, leadership abilities, and athletic performance. *Arthur Hart, III*, in 1984, received a trio of recognitions. He served as Regimental Commander of the Virginia Tech Corps of Cadets, and was chosen as the Outstanding senior in the College of Engineering and the Man of the Year at Virginia Tech. In 1983, *Eileen B. Lynch* was elected President of the Student's Engineering Council which represents the entire student body in engineering to the Dean of Engineering.

For his outstanding academic achievements, *Roy W. Henk* was awarded a Chesapeake and Potomac Telephone Company Scholarship for the 1982-83 academic year. In 1980-81, *Carol May* was awarded a Babcock and Wilcox Company Scholarship for outstanding scholarship. She followed the footsteps of her sister, *Becky M. May* who was awarded a University Distinguished Scholarship

by VPI&SU in 1977-78. In 1977-78, *Jeffrey K. Bennighoff* was awarded an Alumni Presidential Scholarship by VPI&SU.

Graduate Students. A large number of graduate students earned local awards such as election to the honor societies of Tau Beta Pi, Sigma Xi, and Phi Kappa Phi. Furthermore, almost all of the doctoral students had their dissertations published in refereed national and international journals. Some graduate students were honored by other notable awards. Some are listed below. Apologies are extended to all omissions primarily because the author did not have all such information.

In 1985 *Paul R. Heyliger* received the Jefferson Goblet Student Paper Award of the AIAA as the co-author of a research paper. *Jonathan Epstein* was honored with a National Research Council Post Doctoral Fellowship and a Research Associateship from Oxford University which allowed him to pursue postdoctoral studies at Oxford University in 1984-85. In 1983, *Craig Barker* received a Fulbright Grant for graduate study at the DFVLR in West Germany. Following nationwide competition, *Larry A. Marcus* was awarded a national Tau Beta Pi Fellowship for graduate studies at a university of his choice. He enrolled and completed an M.S. Degree in Engineering Mechanics at VPI&SU.

XI. Administration of the Department

Throughout my entire term as Head, I defined my position to be one-half time devoted to administration and one-half time for teaching and research. My love for teaching and research was so great that I did not want to become a full-time administrator as several other Headships in the College of Engineering have become. After completing 19.125 years as Head, I can now proudly state that I taught a course in every term (quarter or semester) of each academic year that I was Head. The summers were occupied by administrative work and vacation time (a small amount). As Head, I continued to conduct sponsored research and to supervise graduate students.

It was obvious that if the department was to improve its sponsored research program and increase the number of graduate students, additional administrative help would be needed. Therefore as a condition of my appointment as Head, the Dean of Engineering officially approved the allocation of one-half of a faculty position for the position of Assistant Department Head. The faculty member occupying this position would be expected to teach and do research for the other one-half time. Throughout my entire tenure, one full faculty position was assigned to administrative duties (0.5 to the Head and 0.5 to the Assistant Head). Even though the administrative procedures became more complex and time consuming, I judged that it was not fair to the faculty to use any more faculty positions in administration even though in some other engineering departments of comparable

size and programs as many as 2.5 faculty positions were used in administration. Each faculty position used in administration was one less available for teaching, thereby increasing the teaching load on everyone in the department. It was heartwarming to note that upon stepping aside as Head, that two positions were allocated to administration.

Some examples of the increase in the bureaucratic processes during my term are worth noting. When I was first appointed as Department Head, the total time required in hiring a new secretary as about one hour. I would fill out one form and go to the Personnel Office which was then located in Burruss Hall, next door. They would allow me to read over all applications on hand. I would select one or two of the best and interview them within a day or two. Even allowing for a two-week notice which the successful applicant would have to give her/his employer, the person would be working in the ESM Department in less than three weeks. Now, the hiring of a secretary consumes about 10 hours of time by all involved and requires a minimum of about six weeks to fill a vacant position. This is because of additional forms (vacancy form, form why each non-successful candidate was not hired, advertising requirements, interview forms, etc.) and the requirement for uniform interviews of each applicant (which may be as high as nine in some cases). Another example has to do with the promotion and tenure process. In the early years of my administration this might consume four to five hours for a single faculty member. Now with the requirements for detailed resumes, outside letters of recommendation, committee reviews at the department (7 members), college (20

members), and university (16 members) levels, approximately 40-50 man hours are consumed in making the same decisions. In my opinion, the decisions were essentially the same under both processes.

The first Assistant Department Head during my tenure was Associate Professor Carl Herakovich. When Carl decided to return to teaching and research on a full-time basis, Associate Professor Jerry Counts agreed to serve for one year. He was followed by Professor Howard Sword who served faithfully and capably, for sixteen years until his retirement from the University on June 30, 1989. The names of the Assistant Heads and their years of service are indicated below. Each of them served well and faithfully.

ASSISTANT DEPARTMENT HEADS

Carl Herakovich	1970-72
Jerry Counts	1972-73
Howard Sword	1973-89 (Retired June 30, 1989)

The position of Head Secretary (a classified position) was also an important one during my administration for I preferred that this position carry as much of the administrative load as possible. The names and years of service for the Head Secretaries are listed below.

HEAD SECRETARIES

Carolyn Kelpien	1970
Lisa Joyner	1970 - 72
Jean Williamson	8/1/72 – 6/1/73
Sharon Wood	6/11/73 – 10/5/73
Carol Sutphin	10/23/73 – 5/31/74
Nancy Linkous	5/27/74 – present (after 1981, Administrative Assistant)

In 1981, the position of Head Secretary was up-graded to Administrative Assistant and Nancy Linkous has continued to serve the department admirably and faithfully in that position, thereby providing a degree of stability to administrative procedures.

Through the years, the laboratories, machine shop and computing lab in the ESM Department have been administered by some very capable people. In addition to the materials testing and fluid mechanics laboratories and machine shop which have been a part of the department since ESM moved into Norris Hall in 1963, a newly created ESM Computational Laboratory was established in room 302 of Norris Hall in 1984. Assisting the Assistant Head in the administration of these facilities were the following individuals.

ENGINEERS AND TECHNICIANS HAVING ADMINISTRATIVE DUTIES

Ken McCauley Lab Instrument Supervisor	1948 – 1986 (retired December 31, 1986)
Robert Davis Lab Instrument Supervisor (Machine Shop Supervisor)	1968 – present
Ron Jansco Lab Instrument Maker	1969 – 1975
David Danello Computer Systems Engineer	1976 – 1982
Don Bodnar Computer Systems Engineer	1982 – 1987
Charlotte Hawley Research Specialist	1984 – 1987
Nasrin Lotfi Computer Systems Engineer	1987 – present
Robert Simonds Electrical Engineer	1981 – present

XII. Tall Tales and Anecdotes

- During the early 1950's, I taught the ESM 3xxx Materials of Engineering lecture course to a class of 196 students. I passed out graded test papers from the previous meeting and then lectured on new material which had to do with brittle and ductile fracture. I brought to the classroom some broken steel bars to illustrate the types of fracture. One student slept through the entire class period; however, he apparently wanted to argue with me after class to gain more points on the test grade. He came up from behind me just after I had put the two broken pieces of the bar together and the fracture surface was not visible. I pulled the two pieces apart as a demonstration to students in front of me. He saw the bar coming apart. I was told that the student wanting more points on his test walked away without a whimper.

- Before copiers became readily available, all faculty members in the department had copies of their notes and tests done through a single ditto machine. An ESM professor with an 8 a.m. class wanted to pass out some notes to his students. He wore a hat and came into the classroom before any students arrived. Suddenly, he realized that he had not run off copies of his notes and went back to the main office to do so. However, as a signal to his students that he was in the building he decided to leave his hat on the desk in front of the classroom. The students came, waited about ten minutes and left. The

professor was delayed because the ditto machine broke down and he had to repair it. When he came into the classroom about 15 minutes late all of the students had departed. At the next class meeting, he berated his students for leaving early stating that the presence of his hat was a signal that they should wait. At the following class meeting, when the professor walked into the classroom there was not a single student present, but instead there was a hat on each desk.

- In my service to the American Academy of Mechanics, I interacted with Professor Robert Haythornthwaite (then at Penn State) who was the founding father of the organization. He introduced me once to a group as the "biggest man" in the field of mechanics. When it was my opportunity to introduce him at another meeting, I introduced him as the "biggest name" in mechanics.

- Several years ago just after the nation changed to Daylight Saving Time (DST) in April, there was an unusually hot spell of weather for several weeks. While visiting the Post Office in Blacksburg, I overheard two Deans discussing the hot weather and why it occurred so early in the spring. One Dean said to the other, "I know why it turned hot so suddenly, it was because of the stupid Congress who voted in the extra hour of sunshine through DST."

- During the early 1950's, almost all travel to meetings occurred in cars and trains. A group of departmental faculty members traveling to a meeting in a car included a professor who had just arrived from Europe. He was still learning the English language and was very precise in obeying all of the rules of the language. We stopped in a restaurant for dinner and he ordered from the menu, under the main course, the listing "pork chops." The waitress brought his plate which contained one pork chop. He told her that the "s" in "pork chops" was plural and that he should be served more than one chop. She agreed and served him another pork chop.