



[Alvin W. Boese Papers.](#)

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ELECTED TO Carlton Society recently, for outstanding contributions to the Company's growth, were (left to right) Carl A. Dahlquist, central research; Alvin W. Boese, retail tape and gift wrap division; A. Farley Thomson, adhesives, coatings and sealers division; and Matthew W. Miller, technical director of Ferrania, a 3M subsidiary in Italy, and chairman of the Board of Minnesota 3M Research, Ltd.

Four Are Elected To Carlton Society

Four employees have been elected to 3M's Carlton Society, in recognition of extraordinary scientific and technical contributions to the Company's growth.

The new members of the Society are Alvin W. Boese, manager of non-woven products, retail tape and gift wrap division;

Carl A. Dahlquist, supervisor of polymer physics, central research; Matthew W. Miller, technical director of Ferrania, the 3M subsidiary in Italy, and chairman of the board of Minnesota 3M Research Ltd., Harlow, England; and A. Farley Thomson, manufacturing manager, adhesives, coatings and sealers division.

Announcement of their election was made last month at the Tech Forum Annual Event, attended by over 2,000 3M technical personnel.

Boese was honored for research contributions to 3M technology in processing and handling fibers into non-woven webs, which have led to such non-woven products as "Sasheen" brand ribbon and non-woven molded face masks. Boese came to 3M in 1930.

Dahlquist received the honor for his research on adhesives which have found broad use in pressure-sensitive tapes and for the invention of equipment to measure elastomeric properties. He joined the Company in 1913.

Miller was cited as a "builder of men and laboratories" and for developing the scientific and technical communications department and technological policies of central research laboratory. He has been with 3M for 21 years.

Thomson was honored for his pioneering development of neoprene elastomer-based adhesives which possess unique adhesion characteristics to metal, plastic, wood and other surfaces, and for continuing developments in adhesives technology. He joined the Company in 1910.

The Carlton Society was founded in 1963 to recognize employees who make significant contributions to the Company's growth. It was named for 3M's fifth president, the late Richard P. Carlton. This recent election brings the number of honorees to 27.

Concept 'Docking' Target

device to form a circle within which is enclosed a "T" bar. The target is mounted on the Lunar Module. Using a sighting designator painted on a porthole of the Command Module, the astronaut will zero in on the target as he approaches the module for the link-up. He will not see the actual docking because of his position in the spacecraft.

Other 3M-developed devices also will go along on the flight. "Kel-F" non-flammable plastic will be used for self-luminous switch tips for some of the controls. Since a disastrous fire killed three astronauts during a ground test of an Apollo space vehicle, NASA has required that all materials within the spacecraft environment must be non-flammable.

Also, a landing point designator (LPD) on a window of the Lunar module is painted on with a phosphorescent paint made by 3M. The designator, an aiming device, will be used to direct the module to its lunar landing point. The LPD and the switch tips are made by nuclear products, also.

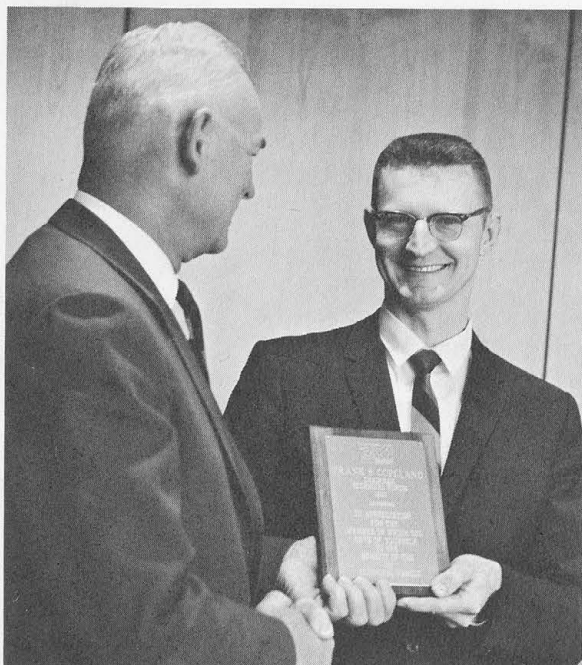
The nuclear products project will assemble 15 docking targets, under a sub-contract with Grumman Aircraft Engineering Corp., the prime contractor for the Lunar Module. Except for the luminous discs, all parts for the target are provided by the Grumman Corp.

3M COMPANY Tech Topics

March, 1968



New Carlton Society members enjoy a lighter moment during a question-and-answer session with the "Tech Topics" Editorial Board. The new members are, left to right, Dr. M. W. Miller, A. W. Boese, A. F. Thomson and C. A. Dahlquist. The four new Carlton Society members are introduced on Page 6 and excerpts from the question-and-answer session start on Page 7.



Dr. C. W. Walton, left, and F. S. Copeland hold plaque presented to Copeland to honor his year of service as Technical Forum chairman. A message from the outgoing Tech Forum chairman appears on Page 3.

Officers Elected, Technical Forum Begins New Year

The 3M Technical Forum has begun a new year of operation with installation of a new chairman and election of new officers. Dr. Robert L. Bohon moved up from chairman-elect to chairman, replacing Frank S. Copeland, who served during 1967. Election of new officers took place during the Annual Tech Forum Representatives' Dinner Meeting, which was held at the Venetian Inn on Feb. 29. Copeland was presented a plaque which honored his year of service as Tech Forum chairman by Dr. C. W. Walton, vice president for research and development. Dr. L. C. Krogh, director of corporate technical planning and coordination, delivered the main speech of the evening, entitled, "The Next Decade." The Tech Forum's new officers are introduced on the next page.

A. W. Boese
Detail Tape & Gift Wrap Div.
M-17E
230-8W

Here Are Your New Tech Forum Officers

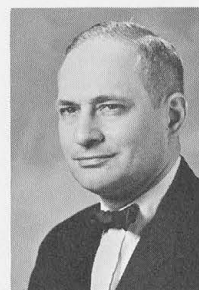


Dr. Robert L. Bohon

Dr. Robert L. Bohon, supervisor of materials evaluation, Research Services, Central Research Laboratories, took over the chairmanship of the Technical Forum on Mar. 1, succeeding Frank S. Copeland. Bohon was a Tech Forum representative in 1965-66, during which time he was instrumental in organizing the Tech Forum Polymer Chapter. He joined 3M in 1956, working first in the physical chemistry section until 1958. From there, he went to the Propellant Research Lab from 1958 until 1963, when he was promoted to his present position. Bohon was born in Decatur, Ill., and was graduated from Decatur High School. He received his B.S. degree in chemical engineering from the University of Illinois and his PhD in physical chemistry from the same school. Professional organizations to which he belongs include American Chemical Society, Alpha Chi Sigma, American Association for the Advancement of Science, Sigma XI and American Scientific Affiliation. The three new officers elected at the Annual Tech Forum Representatives' Dinner Meeting, which was held the evening of Feb. 29, are introduced below.

Chairman-Elect Dr. Marvin W. Sage

Dr. Marvin W. Sage is a chemist specialist in the Reflective Products Laboratory. He joined the Company in 1963 and has been active in reflective products general research since that time. Sage was a Tech Forum representative in 1964-67 and chairman of the Education Committee in 1965-68. He participated in the "High Pressure" symposium in 1965. Sage received his PhD degree in organic chemistry from the University of Chicago and an M.B.A. degree from the same school. His opponents for the office of chairman-elect were Dr. John B. Holden, Jr., and William E. Rowe.



Sage

Secretary Keith E. Dahlman

Keith E. Dahlman came to work for the Company in 1962 as a development chemist in the Medical Products Laboratory, where he was product control and development chemist on the "Addent" dental restorative systems. In 1967, he transferred to the Printing Products Lab, where he presently is working in the new products section. He was a Tech Forum representative in 1965-67 and served during the past year as chairman of the By-Laws Committee and as a member of the Tech Council-Tech Forum Joint Committee. Dahlman received his M.S. degree in organic polymer chemistry from Michigan State. His opponent for secretary was Dr. Richard B. Murphy.



Dahlman



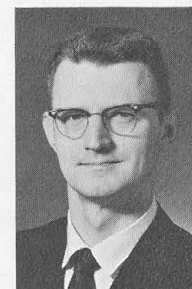
Isaacson

Financial Secretary Dr. William B. Isaacson

Dr. William B. Isaacson joined 3M in 1963 as a senior chemical engineer in the Central Research Pilot Plant. Since that time, he has been involved in a number of problems pertaining to the development of optimum processes for manufacturing new polymer systems. He has been Tech Forum representative since 1966 and is a member of the Central Research Seminar Committee. Isaacson received his B.S. in chemical engineering from Montana State University and his PhD in chemical engineering from the same school. His opponent for financial secretary was Richard W. Munding.

Message From Forum's Retiring Chairman

The idea of a retiring chairman's "swan song" for this issue of "Tech Topics" seemed like a good idea when initially discussed. However, as I thought more about it, I liked the idea less.



Copeland

First, "swan song" is a completely inappropriate phrase. I'm not leaving Technical Forum, nor do I intend to become inactive in it. My responsibilities will merely be less what the organization demands and more what I select at the moment.

Second, I couldn't condense even the barest highlights into the space available. Also, a "thank you" is due to so many who have helped in the last year, a mere listing of all the names would fill one page.

At each new technical employee orientation program, I have explained some of the most significant facts about 3M Technical Forum. One point I have always emphasized is that the organization is what its members make it.

In an effort to show how much this is really true, the following examples are presented:

- a. The by-laws committee felt that several changes should be made in our by-laws and made recommendations which were placed into effect. Thus, through their efforts, the "six months at 3M" requirement for Technical Forum membership was dropped and several recently hired employees became immediately eligible for membership.
- b. John Tomlinson thought that the planned banquet for all Technical Forum members was okay, but a series of talks and discussions on "How to increase your effectiveness in R, D, and E." would be more valuable and meaningful. He made the proposal, accepted the chairmanship of the annual event committee and organized an event which was truly outstanding.
- c. Each standing committee chairman kept his committee functioning and most committee

work was well done.

- d. D. W. Westberg accepted appointment as our program chairman and provided the representatives with outstanding and interesting programs at their meetings.

It must be admitted, however, that everything was not so rosy. One idea of merit was presented to the steering committee by a representative. He was enthused and accepted the chairmanship of a committee to investigate the matter further.

A few months and several phone calls later, I reluctantly accepted the conclusion that the new committee had died through neglect and that the proposal, regardless of its merits, would have to wait for a new champion.

Technical Forum can be a vital organization for the technical family of 3M. For many members it is vital; it is informative, fun, active, worthwhile, and rewarding. For others, I'm afraid, it fills no need; it is dull, unimaginative and a useless waste of time. It is to both of these groups just exactly what they make it to be for them.

I would challenge the new members and the old alike to look to 3M Technical Forum as an organization they can participate in and help make fill their own needs. But these needs are not met merely by joining. They are met as a person participates and makes his ideas known and his efforts felt.

The past year has been interesting, full of work, and at many times exciting for me. I would like to take this opportunity to say "thank you" to all those who have helped to make it so; the steering committee, all standing and special committee chairman and committee members, representatives, executives, advisors, and the many others who have participated in one way or another in Technical Forum and helped make it an on-going organization.

Work with them, and your new officers, committee chairmen, representatives, etc. will continue to make 3M Technical Forum what you want it to be.

— Frank S. Copeland

New Chairman Greets Tech Forum Members

It is an honor to represent, in the capacity of Technical Forum chairman, the increasingly sophisticated technical family at 3M, and I look forward with enthusiasm to helping implement ways in which an organization such as this can be of real value to both the individual member and to the company.

There has been much valuable introspection during the past year concerning the objectives and goals of the Technical Forum. Constructive criticisms frequently have been accompanied by some interesting suggestions on how to strengthen and expand the function and/or effectiveness of the Forum.

A company such as ours with nearly 2,000 technical employees in the St. Paul area alone, a plethora of science-oriented products, and a mandate to remain a growth company by entering new business areas through R & D, can ill-afford to do anything less than an excellent job of marshaling its collective scientific brain power in a wide variety of new ways, not just along established divisional or product lines.

Forum Can Provide Unique Base

Now that's easy to say, but practical, efficient methods of accomplishing such a feat are not always readily apparent. It is at this critical point that the Forum can and should provide a unique technical base from which very valuable and productive ideas and action can germinate and grow.

I do not mean to imply that pathways do not already exist for introduction of new ideas at 3M — far from it, as history graphically testifies — but merely that we have a tremendous potential of interdisciplinary, interdivisional, multi-talented technical people already formally organized into a Technical Forum, and we have only used the surface potential rather than the total kinetic energy of such a group.

Granting the existence of such tools as the Technical Skills Roster, and the fact that interdivisional information exchange takes place through the Technical Council, Information Scientists, written reports, private meetings, and phone conversations, it is certainly appropriate to ask what technical problems might be solved, what new product areas might be nucleated, what wasteful duplication of equipment and research might be avoided, what improvements might be made in the 3M scientist image, if the built-in communication chan-

nels and idea potential of the Forum were fully utilized.

The Forum represents, as no other group does, the practicing scientist at 3M, and our challenge for 1968 is to utilize this organizational capability as fully and effectively as possible. If you are one of those selected by your technical director to serve as a representative, it is your responsibility and privilege to serve as a three-way communication link between the Forum, the members whom you represent, and your director.

Your "communication" in this case is not merely the equivalent of a passive telephone line or printed page, but in addition must serve as a catalyst which converts ideas and information into useful, constructive policies or projects, speeds the flow of technology from one group to another, helps to inspire creative attitudes in you and your peers, and in general helps to develop the full professional capability of the 3M technical family.

Exactly *how* you are to accomplish this somewhat formidable task will vary from person to person and year to year, but experience has shown some valuable methods which the Forum currently employs. The challenge lies in strengthening these existing functions *and* finding new ones which will be especially useful to you and your constituents.

As in other areas of life, your dividends from the Technical Forum will be a direct function of your investment therein; it's naive to expect something for nothing.

Where Ideas Change Into Action

The place where ideas are converted into action within the Forum is the working committee, which is composed of representatives plus co-opted members who have exhibited an interest in some particular aspect of Forum activity.

You are already acquainted with such functions as Education, Science Encouragement, Symposia, "Tech Topics," Programs, New Employee Orientation Programs, Social Activities, etc. Let your representative know where your interests lie, and volunteer your time and energy to assure that fresh ideas grow into reality.

As a Technical Forum member you may introduce ideas and suggestions in several ways: through

your representative, through an appropriate committee chairman or Forum officer, or by direct request to the Forum chairman and Steering Committee.

It was through this last method that the proposal to hold a seminar on "Increasing Effectiveness in R, D and E" grew into the recent Annual Event.

Most of the education courses offered by the Forum are a direct result of suggestions to the Education Committee, both with regard to subject and qualified teachers. The content of the New Employee Orientation program is continually being modified in response to the evaluation comments of the participants.

The Symposia, which contain proprietary information, are almost always a direct result of someone recognizing a communication gap between technical people scattered throughout the company, and most importantly, being willing to do something about it.

The Polymer and Quality Control Chapters of the Forum are also good illustrations of someone recognizing the company-wide utilization of these

disciplines and being willing to become personally involved. The recent revisions of our By-Laws resulted from several positive suggestions from various members.

The variety of programs at the Representatives Meetings (which are open to all members) are a result of suggestions from the representatives themselves. As the name implies the Forum is a discussion group, responsive to the thoughts and concerns of its constituents, and, incidentally, only as effective as its membership makes it.

Let me conclude by pointing out that 3M management is well aware of the practical value of the Forum and not only furnishes moral support, but also backs this up with hard cash. Our budget for 1968 is \$32,860, which does not include the cost of man-hours expended at representatives' meetings, committee meetings, attending educational courses or symposia, etc., etc. Good ideas and constructive program suggestions from Technical Forum have met with enthusiastic support from top management, and I am confident this will continue to be the case during the ensuing year.

The action is up to us!

— Robert L. Bohon

George P. Netherly Retires



Netherly

George P. Netherly, a charter member of the Carlton Society, retired Jan. 1 after 43 years of service with the Company. Netherly joined 3M in 1924 as a technician in the abrasive laboratory. After three years with the Company, he returned to the University of Minnesota to complete his undergraduate work, continuing to work part time at the 3M laboratory. In 1929, he became a full time chemical engineer in the abrasive laboratory. He was named chief chemist in 1930 and technical director of the lab in the early 1940s. He was selected as project coordinator for the New Products Division in 1953, which position he held at retirement. Netherly was one of the 14 charter members of the Carlton Society who were admitted to the newly formed organization in the fall of 1963. He was cited at that time for his contributions to the development of glue-bond sandpaper.



Dr. L. C. Krogh was featured speaker at the Annual Tech Forum Representatives' Dinner Meeting.

Introducing: Four New Members of 3M's Carlton Society

Alvin W. Boese is manager for non-woven products, Retail Tape and Gift Division. His citation for Carlton Society membership read in part: "For numerous contributions to our technology in processing and handling fibers into non-woven webs from which many non-woven products such as 'Mistlon' ribbon, 'Sasheen' ribbon, non-woven molded face masks and non-woven insulating web have been developed; which have contributed substantially to the financial success of the 3M Company, and for patents in the field of non-woven technology."



Boese

Carl A. Dahlquist is supervisor of polymer physics, Chemical Research Laboratory, Central Research Department. Dahlquist's Carlton Society citation read, in part, "A recognized authority on pressure-sensitive tapes and visco-elastic materials; co-inventor and developer of low-adhesion backsizes which have found broad use in pressure-sensitive tapes; inventor of equipment to measure elastomeric properties; holder of several basic patents relating to pressure-sensitive tapes; for publication of many technical papers relating to properties of adhesives and related materials . . ."

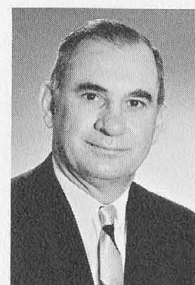


Dahlquist

Dr. Matthew W. Miller is technical director of Ferrania, 3M's photographic products subsidiary in Savona, Italy, and chairman of Minnesota 3M Research, Ltd., Harlow, England. Dr. Miller for cited for Carlton Society membership "for dedication and devotion to scientific and technical achievements; for fulfilling those efforts as a builder of men and laboratories; for developing the Scientific and Technical Communications Department; a constant source of inspiration and a willing and motivating delegator of responsibilities; early developer of technological policies of the Central Research Laboratory . . ."



Miller



Thomson

A. Farley Thomson is manufacturing manager of the Adhesives, Coatings and Sealers Division. Thomson's citation for the Carlton Society included "for pioneering development of neoprene elastomer-based adhesives, possessing unique adhesive characteristics to metal, plastic laminates, wood and other surfaces, which products have provided a significant portion of the sales and profits of the Adhesives, Coatings and Sealers Division; for the joint invention of a new encapsulated adhesive technology and its application to threaded fastening devices to provide a new and unique locking concept; for a wide range of contributions that have led to the technical and business success of these products from early laboratory development through process engineering, pilot plant and as division manufacturing manager . . ."

New Carlton Members Give Their Opinions

Excerpts From Group Interview by Editorial Board of 'Tech Topics'

Can you tell us about what your personal motivation is and what is important to you in your work?

Miller: Sure, it's very simple. I've just been interested in technical work and doing as good a job as possible. If that was good enough, why fine. If it wasn't good enough, I expected someone to tell me that it wasn't good enough.

Boese: I don't have much to add, but he speaks of motivation in the technical sense and I would say in the creative sense, your goals are success, being successful.

Dahlquist: Well, I would say I have had a good deal of motivation to make personal contributions to our Company's technology but I think, or at least I hope, I am equally motivated to encourage others in the same manner. Of course, everyone likes to receive some recognition for what he does and hopes that perhaps he can leave something to posterity, something that might be of general benefit to mankind as well as to 3M. Aside from that, my main motivation is to learn as much as I am capable of learning.

Thomson: The answer so far as I am concerned is that I have been primarily commercially oriented. Thus the drive was to make a product that could sell, period.

Would an incentive plan have proven beneficial to you or wouldn't this have meant much?

Boese: By that question, I assume you mean financial. I don't think so. I think a financial incentive is important to everyone, of course, but it is secondary to the other thing, personal motivation. It is sort of taken for granted.

Do you feel that your supervisors over the years have played a significant role in inspiring you?

Thomson: My position is that the supervisor plays

a role not as inspiration but as a balance against over-response to discouragement.

Do you have a particular method of approach to a problem assignment that you follow?

Miller: No, I don't have a particular system. I'm not that well organized!

Dahlquist: I think I'd ask myself a few questions before I would tackle the problem. I would ask myself if anything in my background gives the possibility of a new or untried approach to the problem. I always ask myself how much has been done by others and what is their current effort. Also, what is the value to 3M as good basic technical information and as potential new business.

Thomson: What I've always attempted to do was to look positively at all efforts and results until you think you have the answer. At that point, you start looking for the possible deficiency in your solution. The first step is real objective analysis to clearly establish the problem needs on a real priority basis. Then you bargain with your sales people and work out the best-effort sales attempt.

Would you say your best work has been systematic or inspired?

Dahlquist: I would say, definitely, it has been systematic, as the result of well-planned experiments, one thing leading to another. I suppose the best example would be the early work we did on a low-adhesion back-size for tape. We started with as basic an approach as we could establish at that time and planned step-by-step experiments until we had a good feeling for the problem and how to solve it. Once you have reached that stage, then I think your work becomes somewhat inspired when you can see a solution or various ways of arriving at a solution.

Miller: You don't just go fishing, or go to sleep and wake up, and all of a sudden have a world-

shaking idea. There's a subconscious thing that I believe in, though. This goes on and you have been subconsciously and consciously analyzing the problem. And then you come to a solution, but you don't just, all of a sudden, see a light and a flash and that's it. The very important thing is to thoroughly analyze and state the problem in specific terms. This way you already have some ideas on what to overcome and how to overcome it.

Thomson: We are in a position today where the solutions to problems of today are sitting in notebooks, put there five years ago. The best development man is the man who understands the various types of demands that industry has and all the different types of industry. I think we leave people in location too long, as contrasted with getting out in the field and seeing industry in action. They are missing the opportunity for solving problems, or knowing what problems exist.

On the point of getting out and seeing people, do you think that on the average there is enough of this now among technical people? Should it be encouraged?

Thomson: I don't think there is enough traveling being done by technical people into areas of business where 3M has not operated. Twenty years ago, we didn't know the leather business and it wasn't until we started thinking we might have something for them that we started looking. And I would imagine there are a lot of other types of businesses that 3M has little or no understanding of.

Do you check your ideas with others and how important are their opinions to you?

Thomson: Yes, continually. Their opinions are important in proportion to their basis. Suppose you check with someone who says, "No," and you ask him why and he says, "I just don't think so." Then you talk with someone else and he says, "Yes," and gives you a number of good reasons, it would have much more importance to you than the other response.

Boese: I don't think there is such a fixed point regarding an idea where you can ask, "What about this idea?" But I think it's an accumulation of many things that maybe become what you call an idea. I think you talk to many people and get many different opinions and get advice and help; some you use and some you don't use.

What type of environment would best nurture productive work? How does 3M stand and what we might do to improve things in this area?

Miller: Answering the second part, in looking at a lot of organizations, I think 3M is very fortunate that we have a lot of freedom and have a very fine environment, if you want to take advantage of it. If you want to work, you can always find some way of doing it, or find the equipment to do it with, even if not always the best. I think the man himself has to create the environment.

Do you think that, in the past, people had the same lackadaisical attitude that many seem to have now?

Miller: I'd say it's still about the same proportion. It just seems different because we live by different standards. There are still people who are perfectly content to do only what is asked of them. There is a small percentage who are ring-leaders, despite the level of education.

Do you feel that other outstanding people at 3M have received adequate recognition? Do you think the dual-ladder system is helpful in this respect?

Dahlquist: I think there are people who should have received more recognition than they got. Again it goes back to what I said, that there are a few who really stand out, but for the most part you are still drawing from the knowledge of others both inside and outside the Company. Does the dual ladder help? I don't think I am very well-qualified to talk on the subject. I was 3M's first research associate in 1952 and I felt under the circumstances that prevailed at that time I wasn't really able to do the work I wanted to do from that research associate arrangement. But I hope

things are different now and I think there's a very serious effort being made to correct that situation. We can't all be managers or supervisors or executive types.

Thomson: Taking your question about whether there is adequate recognition in a broad context, my answer would be, of course not. There has to be a mechanism for recognition and this is not necessarily true in quite a few staff functions such as financial, engineering, process engineering, purchasing and others. Dual ladder has no applications to such areas of activity. In addition, the phrase "adequate recognition" needs a paragraph or so to have common understanding of its meaning.

How important is education to productive work and would you have any suggestions about what 3M might do in this area?

Boese: I'm probably the wrong one to answer this since I'm the only one here who didn't go into a college-technically-trained career. So I had to look for education in many different ways than others do and try to apply it to my own case. Your native ability to work is important and in working to develop products, you would have to say that you were educated by some means, conscious or otherwise. I have almost no association or knowledge of the 3M educational program, so I couldn't comment on that.

Miller: I'm a firm believer in education and I think it is a wonderful thing. Our present-day operations are much more productive because of it.

Dahlquist: This may sound like a platitude, but education is really a lifetime process. You have to stay with it to be strong in your field. You have to devote some of your own time to it. It is not necessarily an eight-to-five process.

Did the recent annual event prove of any benefit to you? Do you have any suggestions on how it might be improved?

Boese: I was only there the first morning but I remember we had four people, each with a half-

hour program, each one different — finances, marketing and all the others. To me, it was accepted with mixed emotions as to what I even heard. If you had taken one subject, like marketing, and had three or four people give a variety of ideas on it, it would probably have been better. Put it this way, you had too little time to adjust yourself as to what the next person was going to say.

Miller: I was tremendously impressed with the speeches our own people gave in the afternoon, as opposed to those who came in from the outside.

What product areas do you feel hold great excitement for the future?

Miller: Two that I am particularly interested in are the photochemical and electrochemical areas. We've neglected the latter in other aspects than fluorination. In the chemistry area, a tremendous one is now growing up in both well-known and odd molecules and their photochemical reactions. I don't think enough exploratory work is being done by us in those areas.

Boese: Well, I'll take a field and not a product. I'd say the textile field is very interesting and a big area that is universal. I think we are in for some tremendous changes in the next few years. The industry is utilizing all the new materials in the old systems. The future will be in utilizing the new materials in many other ways than the old systems.

Thomson: I think you have to accept the fact that if you want to stay alive in today's world, you really better start putting some research and development effort into the military.

Dahlquist: Well, of course, there are huge areas that everyone talks about, such as air pollution, stream pollution, transportation and so forth. There's a lot to be done, but who is going to come up with the specifics? For myself, an area that is challenging is the health or medical field and very specifically, the matter of artificial organs. This is not only an area of great general benefit, but it could be a product area as well.

Acoustic Facility Offers Unique Capabilities

(Following is the first in a series of articles in which various technical facilities and services available within the Company are examined.)

BY HENRY S. KNOLL

Research Engineer, Acoustic Facility,
Research Services

Central Research Laboratories operates an Acoustic Facility located in Building 201, Room E-03 which is equipped and staffed to provide consultation and materials evaluation services to all 3M personnel in the fields of acoustics, noise control, and vibration damping.

The facility consists of two reverberation chambers, an anechoic room, and the peripheral instrumentation. The reverberation chambers are constructed of 9 inch concrete walls which are coated with epoxy paint to make them acoustically hard or reflective.

The anechoic room is built from 12-inch poured concrete, it is R.F. shielded, and has about 3000 34 inch, glass wool wedges on all six surfaces. This room, which is acoustically soft, has a characteristic energy absorption of 99% from 100 Hz (cycles per second) on up. All three of these unique rooms have some common characteristics:

- 1) They are each built on separate foundations poured on a sand base which isolates them from building vibrations, highway traffic vibrations and the like.
- 2) They are of double-wall construction for high acoustic transmission loss. This prevents outside airborne noises from entering the rooms.
- 3) They are all controlled in temperature and humidity. These environmental conditions are especially important in the reverberant room tests.

Several acoustic test procedures which the facility is capable of providing along with some typical examples follow:

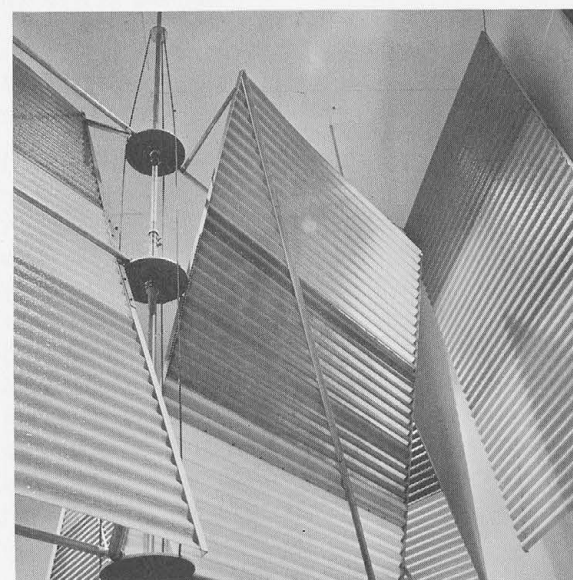
Sound absorption coefficient. This is the fraction of the randomly incident sound power absorbed or otherwise not reflected. This is an important architectural measurement in that it enables the designer to choose and fit materials to his needs before construction. One 3M product measured was

"Tartan" turf. This measurement requires at least 48 square feet. of material.

Normal sound absorption coefficient. This is the fraction of the normal incident sound power absorbed and is useful in screening materials which are candidates as acoustic absorbers. The method requires only a 6 inch by 6 inch sample. If the material looks promising in this test, larger quantities are made and tested in the reverberant rooms. A typical example of this test would be measuring new ceiling tile material candidates.

Acoustic impedance. This is the complex ratio of sound pressure to the particle velocity. This test is used in designing acoustic materials for specific applications.

Sound transmission loss. This is the ratio expressed in decibels of the transmitted sound power on the receiving side of the test specimen to the incident sound power on the source side, when the sound fields on both sides are diffuse. This test used both reverberant rooms with the specimen under test mounted in the wall separating the rooms. This is an architecturally important measurement which aids in the design of partitions



Sound-reflecting panels, including a revolving assembly of vanes in the central area, heighten the echo-inducing qualities of this reverberation chamber.



H. S. Knoll sets up equipment as it might be used for a test inside the Acoustic Facility's anechoic room, where thousands of glass wool wedges absorb sound.

between rooms of buildings, etc. One example would be the measurement of a new wall construction designed by the Industrial Mineral Products Division.

Sound power measurements. Sound power is the rate at which sound energy is radiated from a source. It is the ratio expressed in decibels of the source sound power to a reference sound power. This measurement enables the prediction of how much noise a sound source will make in a given environment. As an example, a particular machine can be measured for sound power output here in the laboratory. If, then, the acoustical environment into which this machine will be placed is known, a prediction can be made as to the amount of "noise" that the machine will make in its place of operation.

Loudspeaker and microphone characterization. Both frequency response and directivity patterns can be obtained for acoustic transducers. Considerable work has been done for the Mincom Division in calibration of microphones and loudspeakers.

Machine noise evaluation. Machines make noise and as our use of machines increases these noises multiply and soon the din in a typical office, transportation module, labo-

ratory, or production facility is higher than desirable for efficient work output or customer comfort. Evaluation of machine noises and their causes should be done in the prototype design phase because once in production any change for acoustic reasons alone is almost impossible. A good example here is the noise reduction obtained on a new overhead projector model for Visual Products.

Complex modulus of elasticity. This is the complex ratio of stress to strain when a material such as a polymer is subjected to a periodic deformation. Measurements are made with a Bruel and Kjaer complex modulus apparatus over the following ranges: Young's modulus 10^8 to 10^{11} dynes/cm²; frequency 20 to 2000 Hz; temperature -240°F to +450°F. A typical example of the use of this test would be the Young's modulus and loss tangent data obtained over a wide temperature range on some adhesives for the Adhesives, Coatings and Sealers Division.

The acoustic facility is available to anyone in the company for either measurement or consultation. Inquiries can be made by contacting H. S. Knoll on extension 3-4637 or R. L. Bohon on extension 3-0423.

Annual Event Chairman Tells His Impressions

With a need to be brief, I may oversimplify. First, there was less difficulty and time required for handling large groups than we guessed. Therefore, it appears possible to compress nearly as much material into a one-day program. The complications of ticket selection could be eliminated in the process.

The excellent presentations given by our speakers left me encouraged about the possibilities of increasing "effectiveness in RD&E". It seemed possible to gain 4% or so efficiency per year by application of techniques such as those discussed. These included computer usage, systems engineering, emphasis on major impact programs involving several groups, better identification and use of entrepreneurs, general education of technical personnel (especially creativity training), and quality cost saving programs.

Of course, none of these will come about merely by having been mentioned in the program; each will require steps by general and technical management and technical personnel, and it is not certain that any of these techniques are safely on the way yet.

Some possibilities for future revisions include more time for questions, expanded use of outside speakers, and further expression of the concerns and opinions of Technical Forum members. The latter could be achieved by preparations in the representatives' meetings to submit questions or proposals in advance to the speakers for their comments, and by having someone present a talk giving the broad concerns of Technical Forum members in fields such as education, personnel practices, budget procedures, etc.

With the experience gained, I think a superior program can be presented in the future. Besides further consideration of some of the same subjects, new topics which come to mind are problem-solving and decision-making techniques, statistics and design of experiments, EVOP, technological forecasting, business opportunities available in services or service/product combinations, methods of early project screening based on financial return predictions, sources of new ideas, individual training and career planning, and the case of a higher percentage R&D expenditure for the best long-range interest of stockholders.

— John D. Tomlinson

It's a Pity They Couldn't Wait Until the Talks Were Over

We were surprised, embarrassed and generally distressed to see about three-fourths of the audience trickle out of the St. Paul Auditorium during the last two presentations of the first day of the Tech Forum Annual Event.

At the very least, this was bad manners; worse yet, it may have been a symptom of a degree of apathy among Tech Forum members that we hope does not really exist.

The quality of the talks was very good, indicating many hours invested in preparation. A committee worked hard to plan and arrange the event. They were, in effect, insulted by those who could not wait until 5:16 p.m. to leave "work."

And ironically, it would seem that these people who left early are the ones at whom the talks were aimed. By their exodus, they denied themselves the opportunity to learn or to be motivated.

We can easily see how committee workers and speakers could be discouraged by this sort of demonstration and be unwilling to invest either their time or resources on such an audience again. The result would be a type of impersonal organ-

ization with which none of us would be very happy.

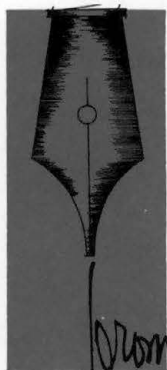
We hope that those early leavers will indulge in a bit of self-examination about their attitudes and that, in the future, we will have a full audience to the last round of appreciative applause.

—The "Tech Topics" Editorial Board

Tech Topics

The "3M Tech Topics" Editorial Board welcomes suggestions for and contributions of individual articles from interested readers, as well as suggestions and opinions regarding the content of this publication. Such suggestions may be mailed or telephoned to Board Chairman H. K. Kapell or to any member of the board.

H. K. Kapell, chairmanFilm Division Lab
H. M. Ray, editor.....Communications
D. J. Enright.....Electro-Products Lab
R. J. Rodrigue.....Inst. & Control
R. L. Bohon, ex-officioCentral Research Labs



To Al Boese

1/19

Jim Keith

Congratulations upon being
named to the Carlton Society;
well deserved recognition.

You may recall our
trying to get you to have
your picture taken "to bring
our files up to date." It
was really for the Carlton
Society thing, but we couldn't
tell you that. Best wishes for
many more years of productive
creativity.

Jim



2501 HUDSON ROAD • SAINT PAUL, MINNESOTA 55119

A.H. REDPATH

DIVISION VICE PRESIDENT
RETAIL TAPE AND GIFT WRAP DIVISION

January 22, 1968

Dear Al,

It was indeed a pleasure for me to see you receive recognition by your election as a member of the Carlton Society.

This honor which has been conferred upon you is one of which you can be justly proud, Al, and I extend to you my heartiest congratulations!

You have my best wishes for continued successes.

Sincerely,

A handwritten signature in cursive script, appearing to be the initials "Al" or a similar name, written in dark ink.

Mr. A. W. Boese, 220-8W



2501 HUDSON ROAD • SAINT PAUL, MINNESOTA 55119

January 31, 1968

Dear Al:

I want to extend my congratulations to you for the recognition provided by election to 3M's Carlton Society.

I think that your efforts in non-woven products and recently in art materials certainly deserve such recognition.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "John", written over the typed name.

John R. Favorite

Mr. A. W. Boese
220-8W



FABRIKSPARKEN 15 . GLOSTRUP

ERNEST B. MOFFET
MANAGING DIRECTOR

February 1, 1968.

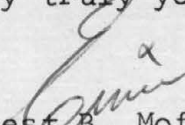
Mr. A. W. Boese
Minnesota Mining and Manufacturing Comp.
Retail Tape & Gift Wrap Division
2501 Hudson Road
St. Paul, Minnesota 55119
U.S.A.

Dear Al:

My most hearty congratulations to you on your selection and initiating into the Carlton society. You have joined the ranks of a great many qualified scientists who have made substantial contribution to 3M over the course of the company's existence. I know it must be a matter of great personal pride to you to have been so selected and to receive recognition for the substantial contributions which you have made in the decoration and non-woven fields.

Again my congratulations, Al, and I hope that we'll have time to swop a few stories on my next trip to St. Paul.

Very truly yours,



Ernest B. Moffet, Jr.

EBM:BH



2501 HUDSON ROAD • SAINT PAUL, MINNESOTA 55119

R. L. SHEPPARD
DIVISION VICE PRESIDENT
PHOTOGRAPHIC PRODUCTS

February 2, 1968

A. W. BOESE

Dear Al:

Since I do not seem to be able to see you too often personally, I am taking this means of offering my heartiest congratulations for your election to the Carlton Society and I certainly heartily endorse their choice of Al Boese.

Your contributions to 3M over the years are well known and this election is well deserved.

Kindest personal regards,



R. L. Sheppard



POST OFFICE BOX 3800
SAINT PAUL, MINNESOTA, U. S. A. 55101

JAMES A. SEARLES
CONTROLLER
INTERNATIONAL DIVISION

March 4, 1968

MR. A. W. BOESE

Dear A. W.

One of the many difficulties associated with this job is the lack of opportunity to maintain contact with old friends. In catching up on the news, I have learned that you have finally received the well deserved Carlton Award. I am genuinely pleased for you and join the legion of well-wishers who have extended their congratulations.

I recall some months ago that you were a motivating force in my decision to proceed with this project in Birchwood. I can state that things are progressing, and upon my return - end of March, it would be appreciated if we could have lunch some day and examine the physical evidence of this huge investment.

Look forward to seeing you and all the best.

James A. Searles

JAS/jgg



2501 HUDSON ROAD • SAINT PAUL, MINNESOTA 55119

BERT S. CROSS
CHAIRMAN OF THE BOARD

March 22, 1968

TO: MR. ALVIN W. BOESE - Retail Tape and Gift Division

Dear Al:

I just happened to be out of town at the time you received your 3M Carlton Society award and I want to congratulate you for the fine results your day-to-day work life for 3M has produced.

I know you get the same deep satisfaction out of this recognition the rest of the Carlton Society members have had and I certainly wish you great further success.

Best regards,

A handwritten signature in dark ink, appearing to read "Bert", written in a cursive, flowing style.

Bert S. Cross

BSC:brl

Megaphone

NEWS BULLETIN NO. 1
JANUARY 19, 1968

TO ALL 3M EMPLOYEES:

FOUR NAMED TO CARLTON SOCIETY

ST. PAUL, MINN., Jan. 19 - Four 3M men were honored recently by being initiated into the Carlton Society, which is made up of 3Mers who have made outstanding contributions to the Company in the technical and product development fields.

Just named to the Society were: A.W. Boese, retail tape and gift wrap, for contributions toward gift wrap, ribbons and face mask products; C.A. Dahlquist, central research, for research on pressure sensitive adhesives; M.W. Miller, photographic products, for broad achievement in building 3M technical programs, and A.F. Thomson, adhesives, coatings and sealers, for contributions to adhesives technology.

Twenty-three others have been similarly honored in past years.

*Mr. Boese
Congratulations to you.
It is good to see that
credit is still being given where
credit is due. You should feel
real proud of the contributions
you have made and also of those
made by people working for those
things we have been giving for you.
in tape coating. My success can be
traced right back to my experience
in Carlton with you and David.
Good Luck
Jill Pottel
23*

POST: Immediately
REMOVE: 1-26-68



MINNESOTA DE FRANCE

CORRESPONDANCE INTER-OFFICE

February 2, 1968

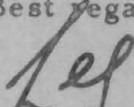
AL W. BOESE - St. Paul 220-8W

OBJET :

Dear Al,

Congratulations on your election to the Carlton Society. You certainly deserve this special honor.

Best regards,


L.M. Berlin
as/-

RECEIVED

Subject: Carlton Awards Ceremony
May 9, 1973

April 5, 1973

TO: ALL MEMBERS OF THE CARLTON SOCIETY

FROM: T. S. REID - CARLTON SOCIETY COMMITTEE - 201-1S

The 1973 Annual Technical Forum Event will be held during May 9-10 in the Auditorium on the first floor of Building 224. As a part of this event, the Carlton Society Awards for 1973 will be made on the afternoon of May 9, 1973. The program will begin with an address by Mr. Harry Heltzer at 3:30 P.M. This will be followed by the presentation of the awards by Dr. Bob Adams. As members of the Carlton Society we are inviting you to attend and sit in the reserved seats at the front of the auditorium. You will receive a badge identifying you as a Carlton Society member.

Receiving a Carlton Society Award is an exciting thing for the recipients since it is one of 3M's means of recognizing outstanding technical achievement. We would like to ask that you make every effort to be present and to be prompt so as to add to the importance and honor of these presentations.

TSR

TSR:ab

[Handwritten signature]

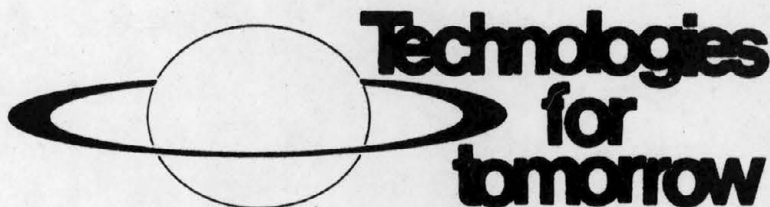
3M^{technical} forum

Announces



Wednesday
May 22

Thursday
May 23



GROWTH AT 3M OFTEN COMES FROM THE APPLICATION OF A TECHNOLOGY TO CREATE A MYRIAD OF NEW PRODUCTS. NON-WOVEN WEB IS A PRIME EXAMPLE. BY FOCUSING ON THE NEW BUSINESSES BASED ON THIS TECHNOLOGY, AND THEN REVIEWING SOME NEW TECHNOLOGIES YOU MAY BE STIMULATED TO CREATE NEW IDEAS AND NEW PRODUCTS.



Exhibits from 44 different groups will be on display
May 22nd 9:00 A.M. - 5:00 P.M.
May 23rd 9:00 A.M. - 2:30 P.M.

in Building 224, Universe Room. Refreshments will be served.

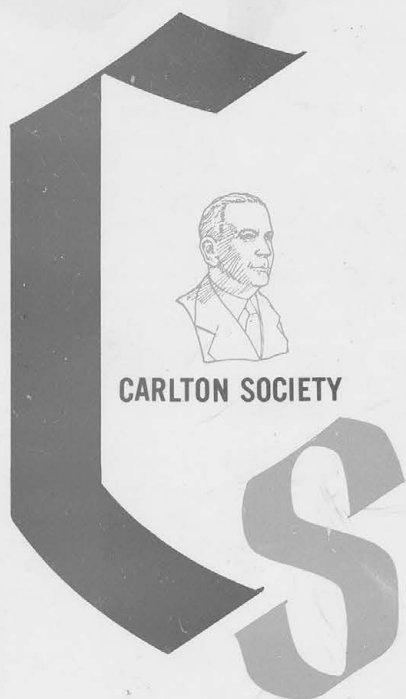


On May 23rd at 3:00 P.M., the Technical Council Carlton Awards will be presented at a special ceremony in Building 224 Cafeteria. Display area to be closed during presentation.



We will be sending more information on the event soon, but circle the dates on your calendar now.

Looking forward to seeing you there!



Eleventh Anniversary Awards Banquet
North Oaks Country Club, St. Paul, Minn.
May 23, 1974

The Carlton Society

named for Richard P. Carlton, is an honorary organization established in 1963 for the purpose of recognizing individuals who have made outstanding contributions to the Company's scientific and technological progress. It is 3M's Hall of Fame for technical people. Elections to the Society are made annually. Candidates must have a minimum of ten years' active employment with the Company. In addition to their contributions to 3M's scientific and technological activities, they must have consistently maintained high standards of originality, dedication, and integrity in technical work; and they must have encouraged younger technical workers and enhanced the Company's reputation as a leader in research and development.

The Carlton Award is corporate management's acknowledgment of the fact that growth and diversification originate at the bench; its purpose is to encourage adventure and perseverance in research.

Richard P. Carlton

was born in 1893 in Minneapolis, Minnesota. He was educated at the University of Minnesota. In 1921 he came to work at 3M as a Laboratory Assistant. Early in his 3M career, he was made responsible for the quality of all products; to Mr. Carlton goes much credit for the high standards of quality of all 3M products and for the diversification in the product line.

In the fall of 1929, Mr. Carlton became a Director and Vice President in charge of Production and Development. On April 13, 1948, Mr. Carlton became an Executive Vice President and the Director of Manufacturing, Engineering, and Research. He was President of 3M Company from September 16, 1949, until May 12, 1953. Richard P. Carlton lived until June 17, 1953. In addition to his contributions to 3M Company, he had been active in civic affairs; he participated in the Miller Hospital Building Fund Drive, was a member of Alumni Advisory Council of Greater University Fund, and worked with the Community Chest.

CARLTON SOCIETY 1974 AWARDS

DR. ERNEST J. DUWELL

For his original research on the wear process involved in sliding a hard mineral on a metal surface and the application of this knowledge to grinding, and his further work on the chemistry of grinding.

PATSY SHERMAN

For her surface energy research leading to the development of the "Scotchgard" line of fluorochemicals for fabric treatment, and for her research in fluorochemical polymerization and synthesis of polymers.

HAROLD G. SOWMAN

For his contributions to the development of the nuclear reactor materials program and powder metallurgy, and for his pioneering in the chemical ceramics program which has led to many new business programs.

WILLIAM A. VIEVERING

For his pioneering efforts in establishing 3M's laboratory and quality control operations, requiring developing both test methods and standards which have resulted in the Company's reputation for quality.

MEMBERS

1963 (Charter Members)

RICHARD G. DREW—For his invention of pressure-sensitive masking tape and pressure-sensitive cellophane tape.

FRANCIS G. OKIE—For his contributions to the early experimental philosophy, and for the invention of waterproof sandpaper.

LLOYD A. HATCH—For his philosophy and guidance in research and development; for the development of an air classification process for uniform grading of abrasive minerals; and for his work with roofing granules.

GEORGE P. NETHERLY—For his development of gluebond sandpaper.

A. E. RAYMOND—For advancement of processes for producing coated abrasives, and for improvements to coated abrasive products.

JOSEPH H. KUGLER—For his inspiration and encouragement to others; for the introduction and extension of synthetic resin technology; and for his work on the electrostatic coating process used in the manufacture of coated abrasives.

HUBERT J. TIERNEY—For broadening and improving the entire line of 3M's pressure-sensitive tapes, and for his contributions to the development of modern manufacturing processes.

GEORGE W. SWENSON—For early laboratory scientific studies, and for the invention of colored ceramic-coated roofing granules.

HARVEY J. LIVERMORE—For numerous contributions in many fields, and for his work on water-dispersed adhesives.

E. WALDO KELLGREN—For his contributions toward the development of rubber resin backing treatments for pressure-sensitive tapes, and for developing superior paper backings for waterproof sandpaper.

CLIFFORD L. JEWETT—For his contributions and continued support of the 3M technical organization, and for the development of the modern roofing granule.

HARRY N. STEPHENS—For key contributions in the development of water-dispersed adhesives; and, under R. P. Carlton, for the organization and development of 3M's Central Research Laboratories.

LEONARD G. NESTOR—For developing and improving manufacturing processes for coated abrasives, and for his work on coated abrasives products.

E. M. JOHNSON—For the introduction of sound engineering principles and improved mechanical equipment for manufacturing, primarily in the areas of tape and coated abrasives. (Awarded posthumously)

BERT S. CROSS—For his tireless and unflagging drive to achieve and to provide improved and new products, and particularly for his early contributions to coated abrasives.

MEMBERS (Cont.)

1964

WILLIAM E. LUNDQUIST—For his dedicated and knowledgeable application of organic chemistry to such important 3M Company product developments as pressure-sensitive adhesives, tape backings, and plastic film.

CARL S. MILLER—For his conception and reduction to practice of the principle of thermographic office copying and for his dedication to its development as a major product technology in 3M Company's growth.

WILFRED W. WETZEL—For early contributions to the instrumental study of elasticity in pressure-sensitive adhesives, and for the technical leadership which established magnetic tape as the world's principal medium for electronic recording and 3M Company as the world's principal supplier of such tape.

1965

GEORGE V. D. TIERS—For fundamental scientific research in nuclear magnetic resonance spectroscopy which enables rapid structural analysis of organic compounds and fluorochemicals; for many publications in that field which have helped to establish 3M's reputation as a leader in research; and for numerous discoveries in fluorine chemistry.

1966

WARREN R. BECK—For his invention of glass and glass bead technology—making possible 3M's commercial development of reflective signs, license plates, and related products.

PHILIP V. PALMQUIST—For major contributions in the invention and development of all-weather reflective sheeting, reflective and anti-reflective coatings and finishes, and other related areas of great commercial significance to 3M.

THOMAS S. REID—For inventions and leadership in many areas of organic chemistry, including basic research in fluorine chemistry, leading to fluorochemical oil- and water-repellent finishes; for his work on adhesion promoters for polymer films and low-adhesion backsizes for tapes; and for the initiation and direction of research in medicinal chemistry.

ERWIN W. ULRICH—For his work in the field of polyacrylate adhesives, vital components in industrial, retail, and medical tapes, and reflective products.

1968

ALVIN W. BOESE—For originating and developing non-woven web technology in 3M, which has led to a wide variety of important commercial products ranging from decorative materials to protective face masks and surgical tape.

CARL A. DAHLQUIST—For invention and development of low adhesion backsizes which are widely used in pressure-sensitive tapes; and for fundamental research on adhesion and on visco-elastic materials.

MATTHEW W. MILLER—For dedication to scientific and technical achievement; for fulfilling those efforts as a builder of men and laboratories; for developing the scientific and technical communications department; and for major contributions to the abrasives laboratory and to the Central Research Laboratories.

A. FARLEY THOMSON—For development of neoprene elastomer materials having unique adhesiveness to a wide variety of surfaces, and which have contributed greatly to 3M's leadership in adhesives; for joint invention of a new encapsulated adhesive technology; and for contributions at all stages of adhesives development.

1969

THOMAS J. BRICE—For fundamental research in fluorine chemistry, including the joint discovery of fluorocarbon sulfonic acids which are essential to 3M's successful commercial development of fluorochemicals; and for initiating and supporting research on aromatic and epoxy polymers and prepolymers, ethyleneimine derivatives, polysulfonamides, and light-sensitive compounds.

SAMUEL SMITH—For the development of commercially successful oil- and water-repellent fluorochemical textile finishes; for prediction and realization of soil release in permanent-press fabrics, a major advance in textile technology; and for discovery of a unique catalyst system for cationic polymerization.

1970

JOSEPH F. ABERE—For his technical contributions in the development of 'Scotchpak' packaging films, reactive bisamide polymers, 'Scotchtab' can sealing systems; and for his interests in composite systems.

JAMES R. JOHNSON—For his involvement in the fields of nuclear products, ceramics, and refractory metals; for his key role in organizing and staffing 3M's Physical Sciences Research Laboratory from which numerous new products have emerged; and for his authorship or co-authorship of 31 technical publications.

GEORGE M. RAMBOSEK—For an unusually broad list of technical and chemical developments, many of which have resulted in commercially successful products, including: the dental adhesive 'Addent'; structural epoxy adhesives for high performance of honeycomb panels; adhesive drying processes, moisture-curing, one part alkalineimine adhesives; 'Tartan' brand surfacing; oleophobic papers prepared with perfluorinated materials; aerosol spray adhesives; 'Podiasin', a new podiatry material; and a polyisocyanurate catalyst.

CHARLES W. WALTON—For his technical leadership and contributions to the development of structural adhesives which led to the revitalization and new growth of the Adhesives, Coatings and Sealers Division; for his great perception in recognizing technical opportunities and guiding them through to successful commercial products; and for his unflagging support and encouragement of 3M Research and Development efforts.

MEMBERS (Cont.)

1971

ARTHUR H. AHLBRECHT—For his technical contributions in the development of 3M's fluorochemical program, especially in the design and synthesis of the critical monomers for the first commercial textile treatments; and for his many patents on the basic compositions for 'Scotchgard' Brand Fabric Finishes and Fluorochemical Surfactants.

ROGER H. APPELDORN—For his technical contributions in the fields of materials and optical equipment for the overhead projection system; and for his many patents in the fields of copying and image projection.

E. WAYNE BOLLMEIER—For his research and development of basic mechanical connecting techniques and insulating materials for communications and electrical distribution; and for his many patents in these fields.

1972

BRYCE L. CLARK—For his technical contributions to the development of copying processes, particularly heat imageable papers, opaque backcoat for infrared copy papers, and electrosensitive recording paper.

WESLEY R. WORKMAN—For his technical contributions to the dual spectrum process and the related dry photo technologies, the photochemistry of diazo sensitized printing plates; and for his many contributions in the reprographic field.

1973

J. O. HENDRICKS—For his contributions to the understanding and development of pressure-sensitive adhesives, particularly physical characterization of adhesives, and development of release coatings or low adhesion backsizes.

R. A. LePAGE—For his contributions to the development of low density abrasives and to non-slip products. He has been the technical leader in the commercialization of these materials under the trademarks, "SCOTCH-BRITE" and "SCOTCH-TRED."

W. C. O'LEARY—For his contributions in the field of aircraft structural bonding film adhesives. He has been the leader in establishing 3M's position in this important area.

J. W. PEARSON—For his many contributions in the field of engineering at 3M and particularly in plastic film extrusion. His accomplishments include the design of the important 3M polyester film manufacturing process.

B. L. SHELLEY—For his contributions in the graphic products area. He has made basic discoveries in electrophotography, dry silver, and the electropowder technology known as 3M's Magne-Dynamic process.

MENU

Coquilles St. Jacques

Creamy Caesar Salad

Or

Fresh Fruit Plate

Chateaubriand

Broiled Shrimp

Asparagus Spears

Candied Carrots

Hot Popovers

Cherries Jubilee Flamed

AN ACKNOWLEDGMENT

Banquet Committee Chairman Wes Workman wishes to thank Don Larson, Elva Christiansen and Berenice Hoffman who have given so generously of their time and talents to prepare for this year's Awards Banquet.

PROGRAM

Master of Ceremonies Clyde Hause

Toast to the 1974 Carlton Society
Award Recipients Harry Heltzer

Toast to the Carlton Society Ray Herzog

Remarks Bob Adams

3M Music Makers Carl Lipke, Director

Sing Out, Sweet Land arr. Alfred

Who Am I arr. Coates

Cherish arr. Arnold

Man of LaMancha Medley arr. Warnick

Stand Up and Cheer arr. Mann

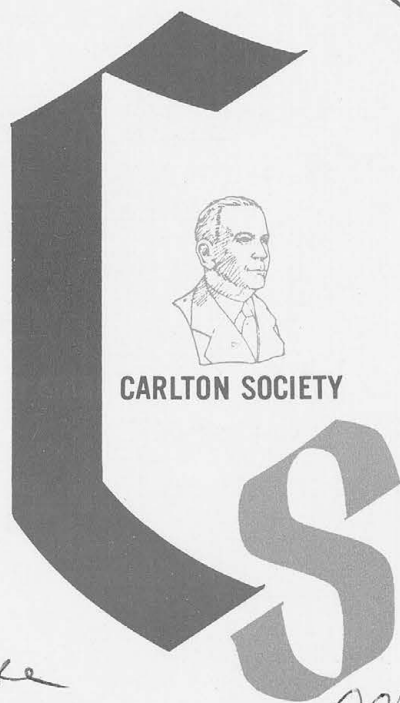
This is My Country arr. Scott

Battle Hymn of the Republic arr. Ringwald

Accompanist, Anne Schuller



CARLTON SOCIETY



Irene Boese

Erwin Ulrick

Loyna Ulrick

Geo. Swenson

Al Boese

Sixteenth Anniversary Awards Banquet

North Oaks Country Club, St. Paul, MN.

Ruth Swenson May 24, 1979

Jim Raymond

Er Raymond

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CARLTON SOCIETY 1979 AWARDS

PAUL E. HANSEN

For his contribution to the development of materials for medical and surgical products, and for his persistent faith and pioneering work in nonwoven webs and specialty fibers.

ROBERT D. MacDONALD

For his laboratory and commercial development of a variety of unique tape backings, and for his visionary research on solvent and pollution-free adhesive coatings.

RONALD A. MITSCH

For his leadership in directing 3M into unique areas of research, the initiation and direction of many diverse new product programs, and for his tireless efforts in the development of people as 3M's most important resource.

MEMBERS

1963 (Charter Members)

- R—**RICHARD G. DREW**—For his invention of pressure-sensitive masking tape and pressure-sensitive cellophane tape.
- D—**FRANCIS G. OKIE**—For his contributions to the early experimental philosophy, and for the invention of waterproof sandpaper.
- D—**LLOYD A. HATCH**—For his philosophy and guidance in research and development; for the development of an air classification process for uniform grading of abrasive minerals; and for his work with roofing granules.
- R—**GEORGE P. NETHERLY**—For his development of gluebond sandpaper.
- R—**A. E. RAYMOND**—For advancement of processes for producing coated abrasives, and for improvements to coated abrasive products.
- D—**JOSEPH H. KUGLER**—For his inspiration and encouragement to others; for the introduction and extension of synthetic resin technology; and for his work on the electrostatic coating process used in the manufacture of coated abrasives.
- R—**HUBERT J. TIERNEY**—For broadening and improving the entire line of 3M's pressure-sensitive tapes, and for his contributions to the development of modern manufacturing processes.
- R—**GEORGE W. SWENSON**—For early laboratory scientific studies, and for the invention of colored ceramic-coated roofing granules.
- D—**HARVEY J. LIVERMORE**—For numerous contributions in many fields, and for his work on water-dispersed adhesives.
- R—**E. WALDO KELLGREN**—For his contributions toward the development of rubber resin backing treatments for pressure-sensitive tapes, and for developing superior paper backings for waterproof sandpaper.
- R—**CLIFFORD L. JEWETT**—For his contributions and continued support of the 3M technical organization, and for the development of the modern roofing granule.
- D—**HARRY N. STEPHENS**—For key contributions in the development of water-dispersed adhesives; and, under R. P. Carlton, for the organization and development of 3M's Central Research Laboratories.
- R—**LEONARD G. NESTOR**—For developing and improving manufacturing processes for coated abrasives, and for his work on coated abrasives products.
- D—**E. M. JOHNSON**—For the introduction of sound engineering principles and improved mechanical equipment for manufacturing, primarily in the areas of tape and coated abrasives. (Awarded posthumously)
- R—**BERT S. CROSS**—For his tireless and unflagging drive to achieve and to provide improved and new products, and particularly for his early contributions to coated abrasives.

R—Retired
D—Deceased

MEMBERS (Cont.)

1964

- R—WILLIAM E. LUNDQUIST**—For his dedicated and knowledgeable application of organic chemistry to such important 3M Company product developments as pressure-sensitive adhesives, tape backings, and plastic film.
- R—CARL S. MILLER**—For his conception and reduction to practice of the principle of thermographic office copying and for his dedication to its development as a major product technology in 3M Company's growth.
- D—WILFRED W. WETZEL**—For early contributions to the instrumental study of elasticity in pressure-sensitive adhesives, and for the technical leadership which established magnetic tape as the world's principal medium for electronic recording and 3M Company as the world's principal supplier of such tape.

1965

GEORGE V. D. TIERS—For fundamental scientific research in nuclear magnetic resonance spectroscopy which enables rapid structural analysis of organic compounds and fluorochemicals; for many publications in that field which have helped to establish 3M's reputation as a leader in research; and for numerous discoveries in fluorine chemistry.

1966

- WARREN R. BECK**—For his invention of glass and glass bead technology—making possible 3M's commercial development of reflective signs, license plates, and related products.
- PHILIP V. PALMQUIST**—For major contributions in the invention and development of all-weather reflective sheeting, reflective and anti-reflective coatings and finishes, and other related areas of great commercial significance to 3M.
- R—THOMAS S. REID**—For inventions and leadership in many areas of organic chemistry, including basic research in fluorine chemistry, leading to fluorochemical oil- and water-repellent finishes; for his work on adhesion promoters for polymer films and low-adhesion backings for tapes; and for the initiation and direction of research in medicinal chemistry.
- ERWIN W. ULRICH**—For his work in the field of polyacrylate adhesives, vital components in industrial, retail, and medical tapes, and reflective products.

1968

- R—ALVIN W. BOESE**—For originating and developing non-woven web technology in 3M, which has led to a wide variety of important commercial products ranging from decorative materials to protective face masks and surgical tape.
- R—CARL A. DAHLQUIST**—For invention and development of low adhesion backings which are widely used in pressure-sensitive tapes; and for fundamental research on adhesion and on visco-elastic materials.

MATTHEW W. MILLER—For dedication to scientific and technical achievement; for fulfilling those efforts as a builder of men and laboratories; for developing the scientific and technical communications department; and for major contributions to the abrasives laboratory and to the Central Research Laboratories.

- R—A. FARLEY THOMSON**—For development of neoprene elastomer materials having unique adhesiveness to a wide variety of surfaces, and which have contributed greatly to 3M's leadership in adhesives; for joint invention of a new encapsulated adhesive technology; and for contributions at all stages of adhesives development.

1969

THOMAS J. BRICE—For fundamental research in fluorine chemistry, including the joint discovery of fluorocarbon sulfonic acids which are essential to 3M's successful commercial development of fluorochemicals; and for initiating and supporting research on aromatic and epoxy polymers and prepolymers, ethyleneimine derivatives, polysulfonamides, and light-sensitive compounds.

SAMUEL SMITH—For the development of commercially successful oil- and water-repellent fluorochemical textile finishes; for prediction and realization of soil release in permanent-press fabrics, a major advance in textile technology; and for discovery of a unique catalyst system for cationic polymerization.

1970

JOSEPH F. ABERE—For his technical contributions in the development of 'Scotchpak' packaging films, reactive bisamide polymers, 'Scotchtab' can sealing systems; and for his interests in composite systems.

JAMES R. JOHNSON—For his involvement in the fields of nuclear products, ceramics, and refractory metals; for his key role in organizing and staffing 3M's Physical Sciences Research Laboratory from which numerous new products have emerged; and for his authorship or co-authorship of 31 technical publications.

GEORGE M. RAMBOSEK—For an unusually broad list of technical and chemical developments, many of which have resulted in commercially successful products, including: the dental adhesive 'Addent'; structural epoxy adhesives for high performance of honeycomb panels; adhesive drying processes, moisture-curing, one part alkalineimine adhesives; 'Tartan' brand surfacing; oleophobic papers prepared with perfluorinated materials; aerosol spray adhesives; 'Podiasin', a new podiatry material; and a polyisocyanurate catalyst.

- R—CHARLES W. WALTON**—For his technical leadership and contributions to the development of structural adhesives which led to the revitalization and new growth of the Adhesives, Coatings and Sealers Division; for his great perception in recognizing technical opportunities and guiding them through to successful commercial products; and for his unflagging support and encouragement of 3M Research and Development efforts.

MEMBERS (Cont.)

1971

ARTHUR H. AHLBRECHT—For his technical contributions in the development of 3M's fluorochemical program, especially in the design and synthesis of the critical monomers for the first commercial textile treatments; and for his many patents on the basic compositions for 'Scotchgard' Brand Fabric Finishes and Fluorochemical Surfactants.

ROGER H. APPELDORN—For his technical contributions in the fields of materials and optical equipment for the overhead projection system; and for his many patents in the fields of copying and image projection.

E. WAYNE BOLLMEIER—For his research and development of basic mechanical connecting techniques and insulating materials for communications and electrical distribution; and for his many patents in these fields.

1972

BRYCE L. CLARK—For his technical contributions to the development of copying processes, particularly heat imageable papers, opaque backcoat for infrared copy papers, and electrosensitive recording paper.

WESLEY R. WORKMAN—For his technical contributions to the dual spectrum process and the related dry photo technologies, the photochemistry of diazo sensitized printing plates; and for his many contributions in the reprographic field.

1973

R—J. O. HENDRICKS—For his contributions to the understanding and development of pressure-sensitive adhesives, particularly physical characterization of adhesives, and development of release coatings or low adhesion backsizes.

R. A. LePAGE—For his contributions to the development of low density abrasives and to non-slip products. He has been the technical leader in the commercialization of these materials under the trademarks, "SCOTCH-BRITE" and "SCOTCH-TRED."

W. C. O'LEARY—For his contributions in the field of aircraft structural bonding film adhesives. He has been the leader in establishing 3M's position in this important area.

J. W. PEARSON—For his many contributions in the field of engineering at 3M and particularly in plastic film extrusion. His accomplishments include the design of the important 3M polyester film manufacturing process.

B. L. SHELLEY—For his contributions in the graphic products area. He has made basic discoveries in electrophotography, dry silver, and the electropowder technology known as 3M's Magne-Dynamic process.

1974

DR. ERNEST J. DUWELL—For his original research on the wear process involved in sliding a hard mineral on a metal surface and the application of this knowledge to grinding, and his further work on the chemistry of grinding.

PATSY SHERMAN—For her surface energy research leading to the development of the "Scotchgard" line of fluorochemicals for fabric treatment, and for her research in fluorochemical polymerization and synthesis of polymers.

HAROLD G. SOWMAN—For his contributions to the development of the nuclear reactor materials program and powder metallurgy, and for his pioneering in the chemical ceramics program which has led to many new business programs.

D—WILLIAM A. VIEVERING—For his pioneering efforts in establishing 3M's laboratory and quality control operations, requiring developing both test methods and standards which have resulted in the Company's reputation for quality.

1975

EDWARD E. LEACH—For his original research and development in the field of electrical connectors, including the "U" contact and flat cable principles, wire forming and precision metal stamping, that has led to the development of new products for the telecommunication and electronics industries.

R—JOHN T. MULLIN—For his pioneering work in establishing magnetic tape recording in the United States, the invention and development of both the differential capstan tape drive and the Isoloop drive, and his leadership in the development of video, instrumentation and audio recorders.

AMBROSE F. SCHMELZLE—For his creative research on the fundamentals of adhesion; for the development of new polymeric materials; and the application of this knowledge to adhesives, release coatings, paper saturants and films resulting in products such as pressure sensitive tapes, magnetic tape and reflective sheeting.

1976

FRANCIS W. BROWN—For his significant and major contributions to the advancement of acrylic adhesive technology; especially in those areas involving pressure-sensitive, aerosol, plasticizer-resistant, high solids and U.V. curing adhesive applications which constitute broad and basic product lines.

MELVIN O. KALLEBERG—For his creative work in building the technical foundations for double-coated tapes and for adhesives transfer products; and for his dedicated development of the process methods for related product lines.

R—Retired
D—Deceased

MEMBERS (Cont.)

1976

MURRAY OLYPHANT — For his pioneering work in developing and evaluating the electrical applications of fluorochemicals, epoxy resins, copper clad laminates, and electromagnetic shielding tapes, as well as for his internationally recognized expertise in the field of electrical phenomena.

ROBERT A. VON BEHREN — For his leadership in the advancement of magnetic tape technology, but especially for his efforts in the field of particle orientation and pigment binders yielding significantly higher magnetic performance and longer wearing tapes and, more recently, for his development of the data cartridge for computer applications.

1977

Luigi Franchi—For his outstanding contributions in the field of amateur photographic films, especially his technical leadership in the development of high quality color films; his innovative emulsion technology; and for teaching photographic science to many 3M scientists.

Richard A. Guenther—For his significant and major contributions to the development of basic fluorochemical materials; for his technical leadership in synthesis and characterization of fluorochemical surfactants; and for his significant assistance to other 3M Divisions.

Douglas L. Johnson—For his many creative contributions and his technical leadership in the development of 3M's polyester film capability; and for his continuing development of innovative film concepts and manufacturing processes.

David A. Morgan—For his outstanding contributions in imaging products, especially the invention and continuous development of 3M's Dry Silver process; and for his creative efforts in the improvement and expansion of electrolytic electrophotographic products for the microfilm industry.

Richard G. Riédesel—For his creative work in developing precision belt sanding equipment and related coated abrasive products; for his innovative developments in fibers and fabrication techniques which led to expansion of several non-woven fiber product lines; and for his pioneering work in acoustical materials.

George H. Smith, Jr.—For his pioneering work and technical leadership in the development of new photopolymer technology which has broad application in basic product lines; for establishing a 3M patent position in chemical crosslinkers for sealants; and for early contributions to fluorochemical technology.

1978

DENNIS J. ENRIGHT—For his outstanding achievement in the development of electronic wire connecting and handling systems; for his contributions in establishing 3M as a leader in telephone cable splicing connectors and methodology; and for his technical leadership in nurturing the growth of these products and innovations.

DR. ARTHUR R. KOTZ—For his many contributions and innovations in the field of graphic reproduction, including electron beam recording, Magni-Dry development, and electronic reproduction systems; for his technical leadership in encouraging the development of pioneering technologies; for his achievements in developing the technical and creative talents of his colleagues.

DR. W. H. PEARLSON—For his technical contributions in the field of fluorine chemistry; for his leadership and innovativeness which led to the growth of 3M's fluorochemical business; for his pioneering spirit and dedication in promoting these technologies.

DR. JOSEPH W. SHEPARD—For his pioneering research and development in establishing electro photographic and dry silver technologies in 3M; for his technical leadership in directing these products to fruition; for his dedication and leadership in establishing 3M as a leader in imaging technologies.

MENU

Caille aux raisins

Salade d' e' pinard

Champagne Sorbet

Chateaubriand Bouquetiere

Sauce Choron

Querelle tomato

Clou-fleur

Pointes d' broccoli

La Fruit Flambe

Wines

Hanns Christoff Liebfraumilch

Louis Jadot Beaujolais

Bon Appétit

PROGRAM

Master of Ceremonies Tom Savereide

Toast to the 1979 Carlton Society

Award Recipients Lew Lehr

Toast to Charter Members

of Carlton Society Ray Herzog

Toast to Carlton Society Bob Adams

DINNER MUSIC JOE JUNG TRIO

PROGRAM

1. The Star-Spangled Banner
2. The Star-Spangled Banner
3. The Star-Spangled Banner
4. The Star-Spangled Banner
5. The Star-Spangled Banner
6. The Star-Spangled Banner
7. The Star-Spangled Banner
8. The Star-Spangled Banner
9. The Star-Spangled Banner
10. The Star-Spangled Banner

DINNER MUSIC - JOE LUNG YING

1. The Star-Spangled Banner
2. The Star-Spangled Banner
3. The Star-Spangled Banner
4. The Star-Spangled Banner
5. The Star-Spangled Banner
6. The Star-Spangled Banner
7. The Star-Spangled Banner
8. The Star-Spangled Banner
9. The Star-Spangled Banner
10. The Star-Spangled Banner

Don Apple

Sam & Er Ray mond
633-5505

Where is your home ↑
1402 W. Leptant
55113

we are two blacks north
of Highway 36 - between
Hamlen & Snelling

When I need a bridge
player, do you want to play
They all hear but me?