



[Alvin W. Boese Papers.](#)

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3M Plans Open House Wednesday

— Why 3M Stayed —
'ME & EINER ...'

**Hours Set
2 to 8 p.m.
At Plant**

An almost casual sounding remark made by a former mayor of Fairmont can be credited today with 3M company's decision to build a large, modern plant here.

The remark was made by Ed Duffey, as he and Einer Nelson sat in on a rather gloomy meeting of Fairmont businessmen, Chamber of Commerce officials and officials of the 3M company in 1950.

3M needed a plant to try out its newly discovered plastic ribbon, and was willing to give Fairmont a chance to locate the plant here.

The long silence grew painful. But then Duffey, who hadn't said a word up to then, leaned over to the man at his left and whispered loud enough for all to hear:

"Heck, me and Einer will put 'em up a building."

And they did. And 3M stayed. And now the stay is permanent.

The Minnesota Mining & Manufacturing company will hold open house tomorrow and Wednesday at its newly completed ribbon plant in Fairmont. Plans for the open house were announced today by L. W. Brown, Fairmont, plant manager.

The visit will bring civic officials, members of the families of 3M employees and the general public to visits planned for tomorrow and Wednesday.

The general public will visit the plant from 2 p.m. to 8 p.m. Wednesday for a tour of the new 160,000 foot building and will be shown some of the operations involved in producing 3M's Sasheen, Lacelon and Decorette ribbons. Brown said children accompanied by their parents are also welcome.

Visitors will see the offices, converting area, warehousing, shipping facilities and other sections of the large building. The only area off limits will be the maker building, the old part of the plant.

Officials said the maker department is off limits because it employs chemicals and compounds which make it a somewhat hazardous area.

Plenty of room is assured for everybody however; the big plant covers 160,000 square feet.

Members of the families of employees will visit the new facilities tomorrow. "The family day" open house for employees only will be held from 1 to 8 p.m.

Ceremonies officially opening the building will be attended by a group of executives from St. Paul including Herbert P. Buetow, president of 3M; Clarence B. Sampair, executive vice president in charge of tape and ribbon products and head of 3M International; Cyril P. Pesek, vice president for engineering and staff manufacturing; and Alan H. Redpath, general manager of the ribbon division.

The 3M executive group, the management group from the 3M plant, public officials, and civic leaders will tour the plant tomorrow morning. The executives will fly to Fairmont in one of the company's DC-3 airplanes.

They are scheduled to arrive at the airport about 9:30 a.m. and they will return to St. Paul late tomorrow afternoon following a luncheon with civic leaders at Ledeburs.

The new building lies on a 26 acre tract of land owned by 3M. When construction of the new facilities was started late in 1953 the site contained two buildings to

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10 Year Visit Ends With 3M Deciding to Make It Home

A ten-year period of more or less temporary residence in Fairmont turned suddenly 18 months ago into an outlook for a long and happy stay for Minnesota Mining & Manufacturing company.

The change came Aug. 18, 1953, when the company announced it would buy a building then rented in Fairmont and would construct a new building.

Purchased was the 4-acre site and concrete block building formerly owned by Ed Duffey and Einer Nelson. Bought with it by the company was an adjoining 22 acres in Robert Greenhurst.

C. B. Sampair, vice president in charge of the ribbon manufacturing department of the company, said the firm planned to construct a 115,000 square foot addition on the newly acquired property.

Cost of the entire transaction was set at \$1.5 million.

The new plant was to put under one roof the maker and converter plants of the ribbon division. The two plants were at the time located in 15,000 square foot building on State street and the Reco Motor building on E. Blue Earth avenue.

Nine months later the firm announced that growing production forced an addition of another 30,000 square feet on the east end of the building then under construction.

Growth of the ribbon division in the local plant has been spectacular from its very start, and it was the decision of the company to try out ribbon along with a decision of local men to provide a ribbon plant which has the firm here today.

3M came to Fairmont in 1933 largely through the efforts of Leonard W. Forstrom, then president of the Fairmont Chamber of Commerce, and the

late John Dickinson, the treasurer.

The firm was established in the then new Reco Motor building for the manufacture of abrasives. But the manufacture of abrasives moved so fast the local space soon was not adequate. Cumberland, Wis., offered a huge plant on a long term lease.

But at the same time, 3M researchers discovered the plastic ribbon that was to have a big part in shaping the destiny of 3M relations with Fairmont.

The company decided to offer the ribbon plant to Fairmont. Again space was not available. But the Chamber of Commerce met

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TO COME HERE — Herbert P. Buetow, president of 3M, will head a group of company executives who will tour the new Fairmont Ribbon plant tomorrow. Buetow, president of 3M since 1953, is now in his 30th year with the company.

He rose through the ranks in various financial and accounting assignments, having served as controller, treasurer, and executive vice president in charge of finance.

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FAIRMONT 3M MANAGER L. W. BROWN HOLDS ROLL OF RIBBON, PRODUCT OF THE NEW \$1.5 MILLION PLANT

Young Plant Run By Young People

Fairmont's new ribbon building is not all that is "young" about the local branch of 3M. The ribbon division itself is comparatively young, and it has a group of young men in management positions.

Average age of management at the plant is the mid-thirties. Asked why, one of the employees said he surmises the reason to be that young men are more adaptable, more energetic.

"After all," he said, "3M is young, and the ribbon division is a young part of the company. But most of them have been with 3M for some time."

And youth is reflected all the way up to the local plant manager, L. W. "Mike" Brown. The Sentinel wanted to know Brown's age for one of its stories and asked one of the management personnel at the plant if he knew Brown's age. "I don't know," he said. "But he says he's 18."

Climate Caused Move

Two Harbors, Duluth and St. Paul were the homes of the original 3M company. The firm moved to St. Paul after it was found that the climate around Duluth was not favorable for drying the paper. The move to St. Paul came in 1910.

Research Started Small

The 3M laboratory, so important to the firm, started in 1916 at a cost of \$500. A history of the company said, "This was a considerable sum for 3M in 1916, but it turned out to be a most profitable movement."

New \$1.5 Million Ribbon Plant In Fairmont Covers 4 Acres

Minnesota Mining & Manufacturing company's new \$1.5 million ribbon plant on N. State street, has been carefully designed to provide the safest, most pleasant and most efficient possible working conditions.

The office area is completely air conditioned the year around. While it is not practical to air condition the remainder of the huge 160,000 square foot building, ventilating equipment draws fresh air from the outside and filters to provide a complete change of air for the entire building every few minutes.

Special equipment has been installed to eliminate unpleasant fumes from certain production areas before the air from these

parts of the building is removed from the building through exhaust vents.

Two huge boilers provide steam for the plant. Heating equipment is located in the penthouse on the roof, which also houses the ventilating fans that draw air in from the outside and circulate it to all parts of the building. During the heating season, the plant enjoys much better temperature control than was possible in previous facilities.

All areas of the plant have the latest and most efficient types of equipment available. Lighting is excellent.

In the converting department (where most of the hourly paid women employees work) illumination is the equivalent of the light available out of doors at mid-morning on a clear, sunny day.

The spacious parking lot for 140 cars at the south of the building is lighted at night for the benefit of workers in the second and third shifts. Scotch light signs and markers give protection to drivers. The plant operates on three shifts in the making department, and two in the converting department.

The building itself covers almost four acres. As yet a public address system is not installed and "you get to know how big a building this is when you look for somebody to answer the telephone," one employee said.

Another 22 acres for expansion is available to the east and south of the building.

If the firm finds expansion necessary, it will build outward

rather than up. The plant is built for one floor only. An employee explained that the firm has found that the man-hours lost in people waiting for elevators are more than paid for by the cost of expanding on one floor.

The new addition is entirely concrete blocking with brick for its steel construction. It has steel beams supporting the roof and all inside walls and partitions could be removed if desired.

The roof is constructed of pre-cast concrete slabs and covered with a gravel-pitch roofing.

Converter and maker areas require areas of about 100 by 150 feet each. More than half of the plant is storage.

A wood paneled reception area greets the visitor as he steps into the front door of the building. East of the reception room is a large office area and at the south end of the business office are the offices of the management men at the plant.

In the center of the large building is a lunch room where coffee, cigarettes, hot soup, milk, candy and other items are available from dispensing machines. Also located there is a completely equipped first aid station which has the only air conditioning unit outside the offices, and also toilets and locker facilities for men as well as women employees.

Flooring throughout the building other than in the offices is concrete with markers made of plastic tapes manufactured by 3M.

3M Started In Fairmont With Abrasives

Minnesota Mining & Manufacturing company first began operations here in 1946, establishing an abrasives converting plant which was moved from the city a few months before decorative ribbon manufacturing began here in 1950.

The original plant began in 1946, when it received

rolls of sandpaper and other coated abrasives from St. Paul and converted them into sanding and grinding belts. At one time, this plant employed about 150 persons.

3M moved the abrasives converting operation to Cumberland, Wis., in May of 1950. There were a number of factors which tended to make operations at Cumberland more economical, one of which was Cumberland's closer proximity to St. Paul, which meant substantial savings in the cost of transporting materials. Also a huge plant was available there.

A number of the people prominent in the Fairmont abrasives converting plant are still associated with this operation at the Cumberland plant.

They include L. W. Bohn, plant manager (and brother of Carl Bohn, foreman of the making department at the Fairmont ribbon plant) production foreman Arthur Erickson and George Gormann, and office manager Leslie M. Mathwig. Mathwig, a Fairmont native, joined 3M shortly after it began abrasives operations here.

Ten-Cent Comb and Pound of Yarn Started 3M Ribbon on Its Way to Success

The spacious new decorative ribbon plant which Minnesota Mining & Manufacturing Co. has just completed on North State street is a building which might well never have existed.

Residents of the Fairmont area are familiar, in general terms at least, with the way the local plant has grown since 3M started its ribbon manufacturing operation here in 1950.

Very few however, are aware of the way in which 3M happened to enter the ribbon business, or realize 3M very nearly despaired of ever making a profit on the product and almost abandoned it on a number of occasions before it ever began operations here.

At the outset of the project, 3M had no intention whatever of entering the ribbon field. The research which eventually led to "Sasheen," "Lacelon," and "Decorette" ribbon started in 1940 in the tape lab.

3M was looking for an improved backing for electrical insulating tape, and synthetic fibers seemed a likely avenue of approach. A number of Eastern paper mills were asked to develop a suitable

material, but none were successful.

The tape lab purchased a bench model paper beater, and a small sheet former, and prepared to conduct its own paper-making experiments. A lab worker named Alvin W. Boese was asked to "acquaint" himself with the art of paper making. Boese was given free reign, but was unable to come up with a suitable material for the tape backing.

But Boese did develop an interest in non-woven fibers which was to develop eventually into the ribbon business. On its own initiative, the lab began experimenting with carded synthetic fibers, and succeeded in finding a way by which they could be bonded with heat.

Boese's pre-war experiments led to the development of a continuous synthetic fiber batting which became "Mistlon" — forerunner of the present "Sasheen" ribbon. But at this stage all 3M had was a process. It did not have any usable products which could be made employing this new technique.

At this time the Japanese attack on Pearl Harbor and Boese's experiment was shelved. In 1943

the project was reactivated, and the lab continued to look for other uses for the new process.

While looking at a department store window display, Boese got the idea that his non-woven bat-

ting might be suitable for use as brighten it up.

In 1944, Boese got the idea of a display material. Experiments were begun along this line. The

slitting the material up for ribbon.

His first experiment was to cut the

material into two-inch strips (if

indicated by the fact that Boese

did his printing with a pattern cut

from an old inner-tube.

Ignoring the normal channel's

sales research, Boese went to a St.

Paul department store with 100

rolls of his ribbon and asked them

to try to sell it. The store sold

all 100 rolls.

3M, seeing decorative ribbon

as a natural "companion" item

for its gift-wrap tapes, decided

to place a limited quantity of

the ribbon on the market for

the Christmas season of 1945.

A contest was held among em-

ployees to select a name for

the new product, and "Mistlon"

was the winning entry.

Results of the 1945 experiment

were just successful enough to

merit a slightly expanded program

in 1946. But the product had two

serious shortcomings. "Mistlon"

lacked tensile strength and did not

have enough sheen to give it the

eye appeal it needed.

Management, with little reason

to be encouraged about "Mistlon"

finally decided to continue the

ribbon program for another year or

so.

Leaving work one evening, he

had placed a sheet of paper under

the spinning head to keep the

material still in it from dropping

into the curing oven below and

clogging up the oven. The spinning

head, normally held in a fixed

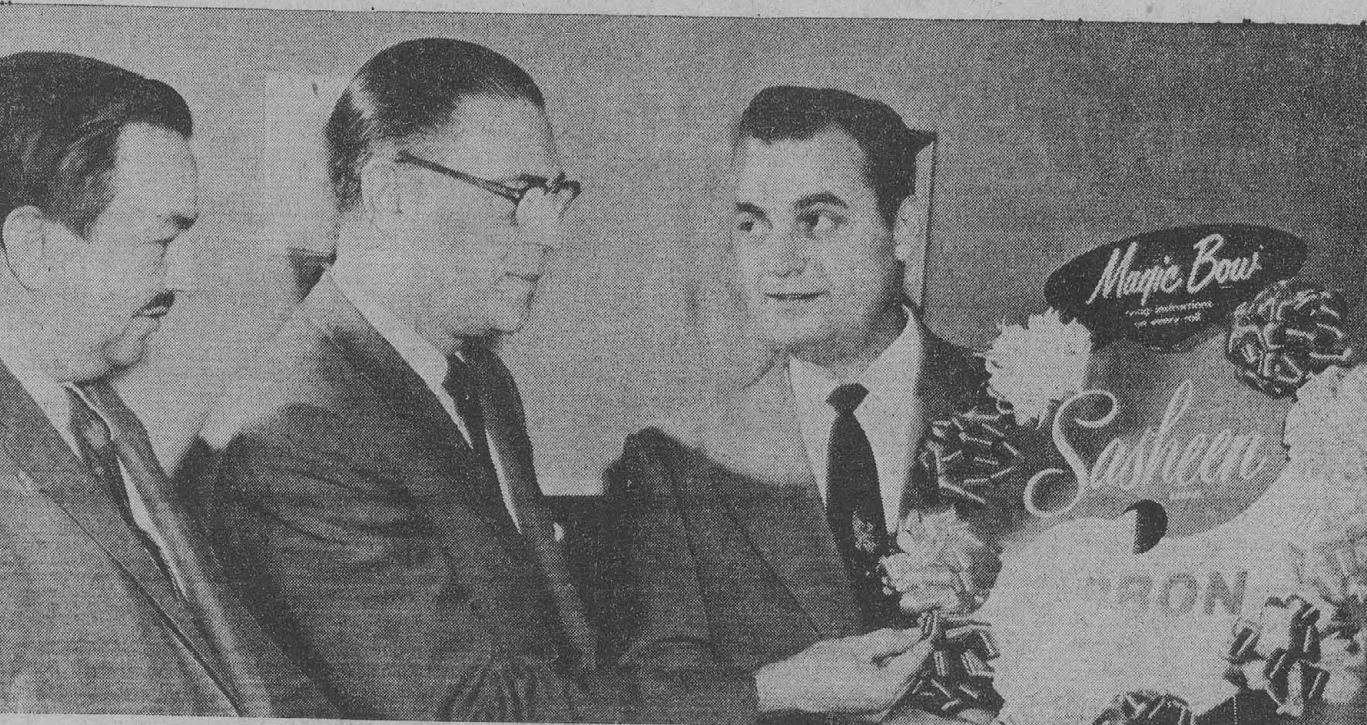
position, was loosened. As Hoover

disappeared out of the door the

spinning head was swinging lazily

in a circular pattern — the fibers

falling onto the paper.



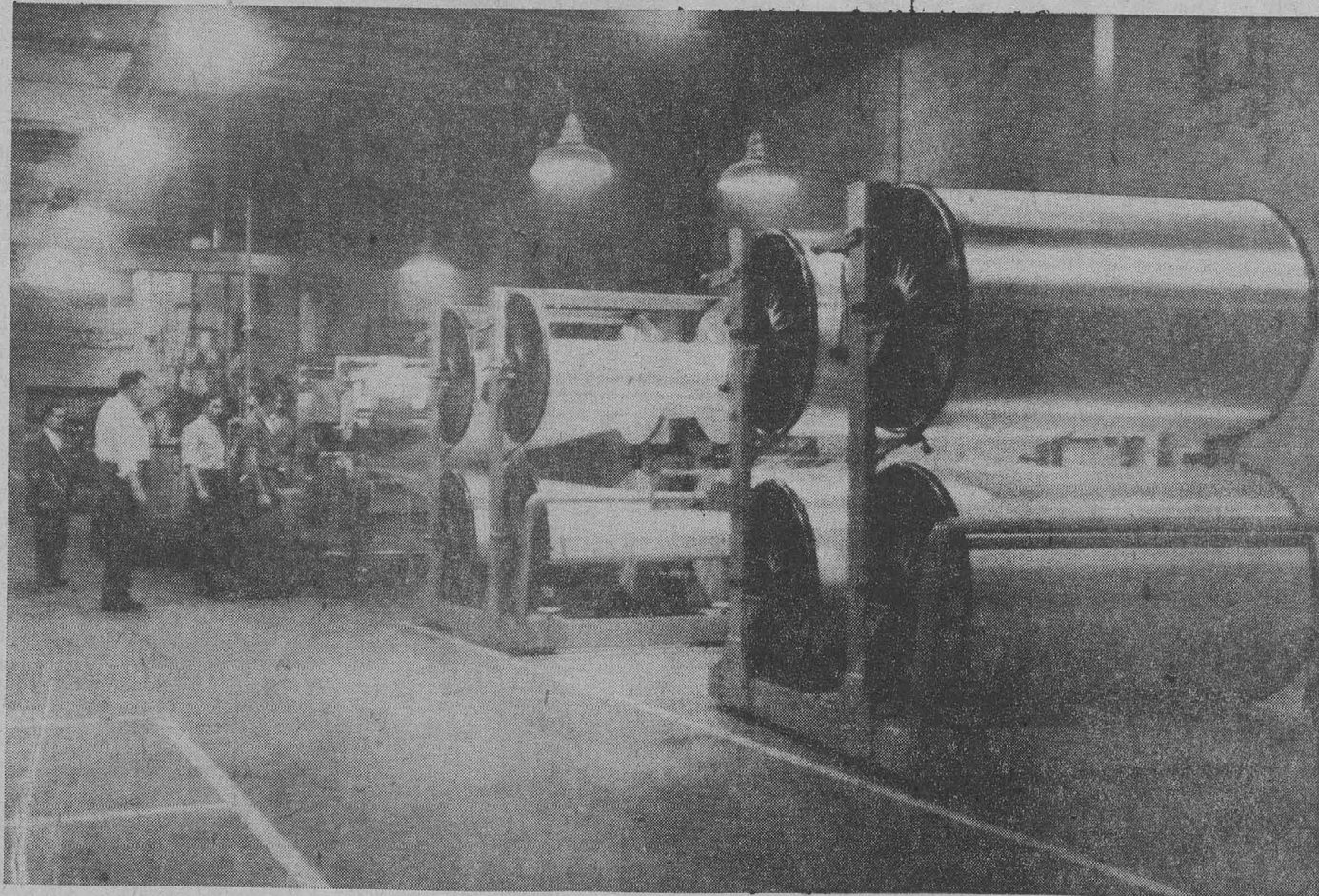
THEY HAD FAITH — Three men who had faith and played major roles in the development of 3M's decorative ribbon business inspect a display of pre-tied "Magic Bows" made from

"Sasheen" ribbon. Left to right are Alvin W. Boese, technical director for the ribbon division, Alan H. Redpath, general manager of the division, and C. E. Poole, general sales manager.

Here's How Ribbon's Made---From Cellulose to Pretty Bow



WEIGHING IN RAW MATERIALS — Richard Dyslin weighs acetate and viscous fiber, the cellulose materials used for manufacture of the rolls of ribbon. The material, which comes in big cartons, is purchased by the plant. In turn, the raw material is fed into the garnett machine, a common fixture in the textile industry which transforms the raw material into a web.

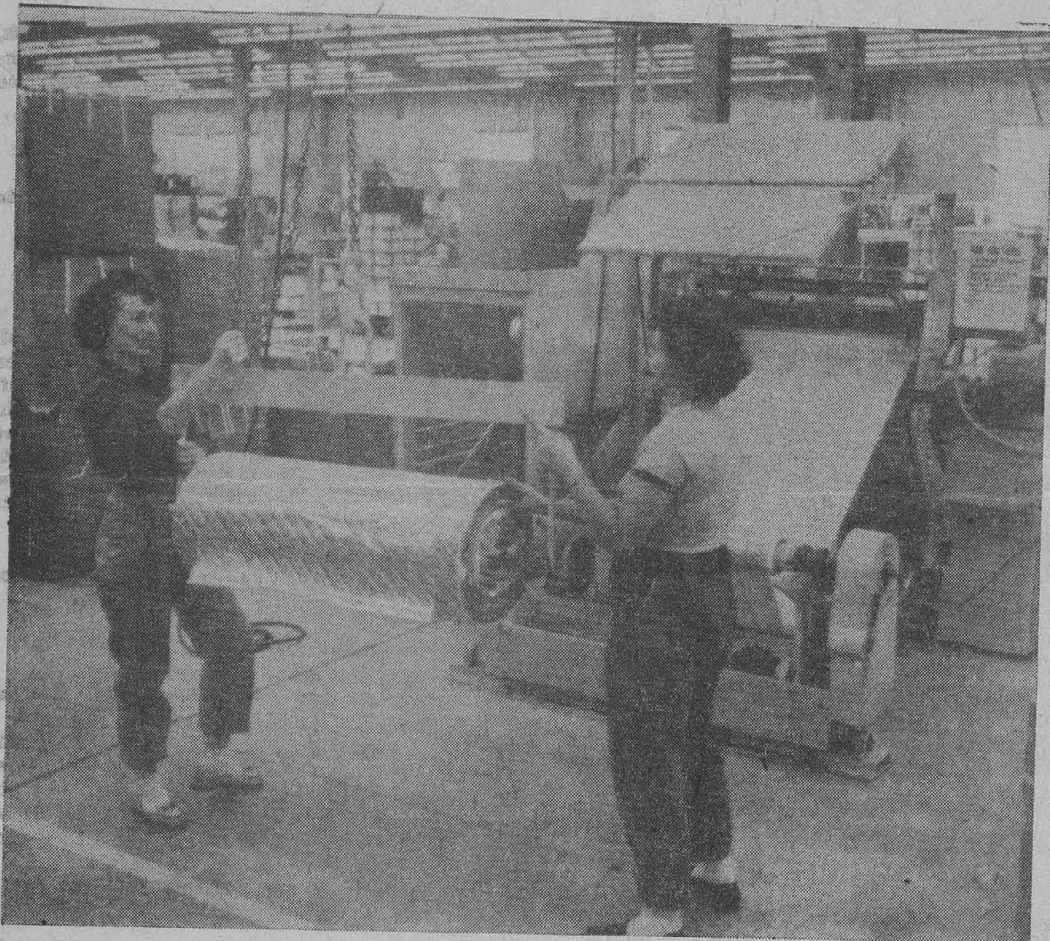


COLOR AND ALIGNMENT ADDED — Here the large rolls of acetate are fed into a machine which combines it with the web from the garnett machine. The material then enters a

machine for alignment and dyes. Just beyond it, toward the top of the picture, can be seen the oven used for drying the completed rolls.

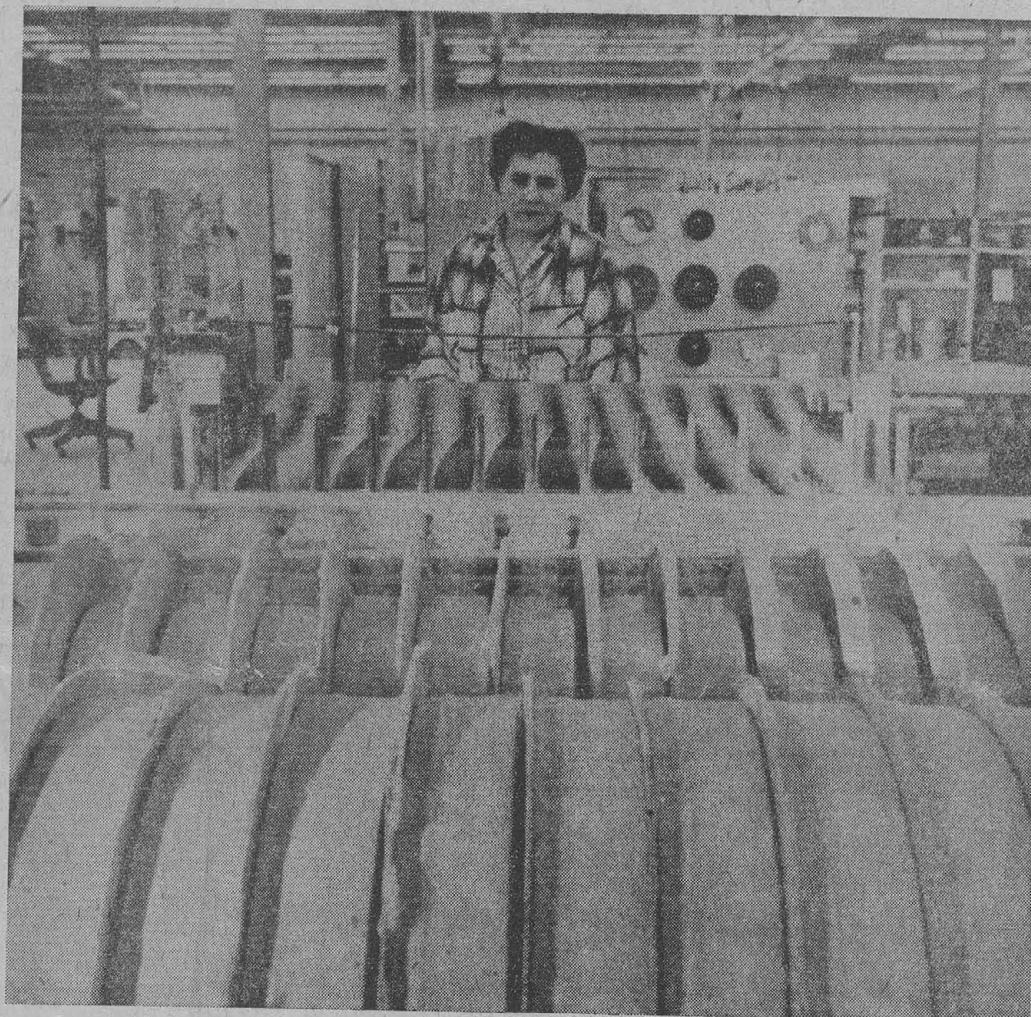


INSPECTION — Richard Scheff watches carefully as the jumbo rolls of sasheen ribbon wind up as they come out of the dyeing and aligning machine. The 36-inch wide roll is inspected here for flaws or imperfections. These large 36-inch rolls are the final product of the company's maker department.



READY FOR CONVERTING PROCESS — Geraldine Htenueller and Genevieve Barnett lift a completed jumbo roll of sasheen ribbon onto a slitting machine which cuts the rolls

into more easily handled units for further work. Despite the size of the roll, it is handled easily by the two women.



COMMERCIAL SIZES — Marge Williams operates a converting machine which winds off jumbo rolls of Lacelon into large commercial size rolls. The plant makes smaller rolls for

home as well as commercial use. The ribbon products of the plant are used entirely for decorative purposes.



HANDY HOME SIZES — Virginia Krumholz winds up rolls of Sasheen ribbon for home use. The rolls are those common to the householder who has bought the 3M product for wrapping of Christmas gifts and for gift wrapping through the year. The plant puts out Sasheen, Lacelon and Decorette ribbon.

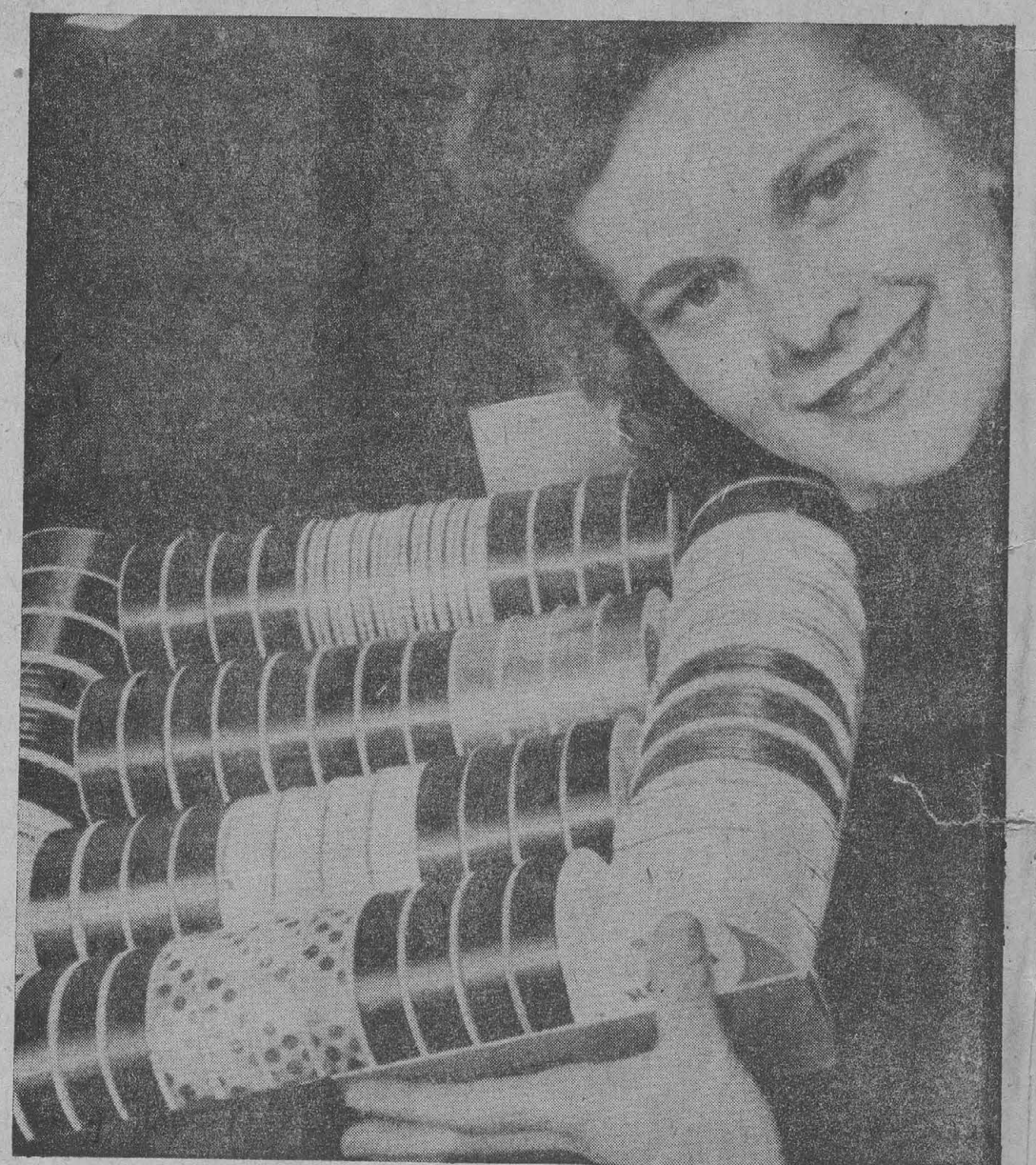


PACKAGING — Ruby Urban, looking something like an organist at a very large console, is making up packages of display items for shipment over the nation. Into the cartons go

the various colors and kinds of ribbon you can find in retail stores. The various bins contain the different colors and kinds.



Sentinel Photos
By BOB SCHROEDER



COMPLETED PRODUCT — Mary Ann Ramsey, a member of the office force, holds a completed carton of the various ribbons. The carton is called the firm's small roll display pack-

age. These are the end products after the complicated processes of making and slitting the rolls.

Head of 3M Sees Great Future Here

Interesting Story
Yet to be Written,
Buetow States

"I like to think that the most interesting chapter of the 3M ribbon story is yet to be written."

So said Herbert P. Buetow, president of 3M, in an address today to a group of some 55 Fairmont business and civic leaders and visiting 3M officials.

Buetow spoke to the group at a noon luncheon at Ledeburs following a tour of 3M's new \$1.5 million ribbon plant in Fairmont.

The appearance of Buetow and other 3M officials marked the opening of a 2-day open house, at which employees and the general public will see the new local plant and will learn how ribbon is manufactured.

Buetow said, "It would be unwise to try to make precise predictions about the future of our ribbon operation here. But among our major reasons for our confidence about the future are our loyal employees and the support and cooperation given 3M by the entire community. They give us good reason to look forward with confidence to the future."

During the luncheon, C. B. Sampair, executive vice president and head of the ribbon division, presented to Plant Manager L. W. Brown, the president's safety award.

He said the Fairmont plant is the first in 3M history to go a year without a time-loss accident.

Among the two plane loads of 3M executives flying here this morning from St. Paul was Al Boese, 3M researcher, who discovered the ribbon product.

Boese said: "After completing a tour of the new plant it is almost unbelievable. Sometimes in research we become so involved in details that we lose sight of the end result."

Boese said the ribbon product is just the beginning. A by-product is already being made here, an electrical insulating material, and pilot tests are being completed in the St. Paul laboratory on a packaging material which probably will be brought here and put in production in July.

This afternoon employees families will tour the plant from 2 p.m. to 3 p.m. and tomorrow the general public makes the tour during the same hours.

ONLY HUMAN

By Sidney Fields

• He Really Stuck to It

It all started when Richard Gurley Drew, a former banjo player, was watching a man paint a car. To get two colors the man used carton sealing tape as a separation. When he was all through painting, he pulled the tape off and with it came the paint and lacquer, right down to the metal. "What you need," Drew suggested, "is a gummed tape that won't harden or dry." "If you're so damned smart," the frustrated painter snorted, "why don't you make some?" Drew did. After a lot of fumbles, trying chewing gum and heavy oil on paper, he coated a roll of

Boese, a high school dropout, Drew developed sashen ribbon, a synthetic tissue you can't tear. You use it for gift wrapping. A heavier version in tape with glass fibre is so strong it's used to tie steel rods when being shipped.

With two other of his bright boys Drew created Tartan surfacing material, a rubber-like synthetic substance used to surface athletic fields and all-weather harness racing tracks.

46 Years Was Enough

The company would still like to have him go on "fooling around." But after 46 years he decided to ease off and spend all the time he can with his wife and children: His son, Don, 27, is a math teacher. A second son, Dennis, 25, is doing graduate work at the University of Minnesota, and his daughter, Peggy, teaches the 5th grade in St. Paul.

"We just bought some land in Santa Barbara, Calif., and a trailer for a pad," Drew said, "and we're just going to knock around, far from the madding lab."

He calls himself "a primitive inventor." He defines it this way:

"A primitive inventor is like a good chef. He can't give you the chemical formula for the protein in a steak, but he can tell you whether it's good or bad and make it taste delicious."



Richard Gurley Drew—a "primitive inventor."

ordinary hand-toweling with glue and glycerine. It worked. He used stronger paper and stronger adhesives. It worked better. He was 25 then.

It's known as masking tape, a minor discovery that made Drew a millionaire. With a few other things he turned up or inspired, it also helped make Minnesota Mining and Manufacturing a billion-dollar company.

White-haired, 67, with an engaging smile and a wit to match, Drew recently left his full-time job with 3M as director of its products fabrication lab and is now tapering off as a company consultant. He was born in St. Paul, Minn., and less than three months in college because it was tough to get passing grades and play a banjo in a dance band at the same time. He must have started in the company's lab as a technician.

Call Him Flunkey

"You can call it that, if you don't mind being careless with the truth," he said. "Flunkey would be closer."

After taking a correspondence course in machine design, he decided he was an apprentice draftsman and applied for a job. They made him a lab helper at \$65 a month.

While trying to perfect his masking tape he was moved up from flunkey to lab assistant. After he got it right, someone coated it with cellophane to protect it from changes in the weather.

"It occurred to me that it might be possible to coat only the transparent cellophane with the glue and glycerine," Drew recalled.

Finds New Tape

The result was another minor discovery called Scotch tape or Scotch brand transparent tape.

They kept raising his salary, giving him sizeable quarterly bonuses, nice options to buy the thriving company's stock, and, before he was 40, a fat retirement pension.

In 1944, he was given his own fancy lab and a fancier title: Director of Products Fabrication.

"They told me to fool around," Drew said, "and gave me a bunch of bright young men to help me do it."

He selected them more for their imagination than their college degrees. With one of them, Al

One man's idea sparked 3M successes

By GEORGE JOHNSON
The Minneapolis Star

It may just look like a floor mat to you and me, but sometimes when inventor Al Matthews walks into a building and steps on a state-of-the-art, extra-duty, water-absorbent Nomad-brand floor mat, he can't help but feel a glow of pride.

Matthews invented fiber-51, the mat's main material, and was chief entrepreneur of the process by which fibers are coiled into thousands of little loops that make up the pads.

He is, in short, the father of 3M Co.'s Nomad line.

"In my opinion," says Ron Mitsch, who was lab director for the Nomad project, "it's the world's most efficient floor mat."

He picks up a 6-inch circular sample.

"Al Matthews had a real belief in this. If it hadn't been for that belief, it wouldn't be a successful product today."

It may not seem like a big deal, but somebody has to invent these things.

And all the little features we take for granted—the mat's resiliency, the way it's designed to keep dirt from falling through—may be the result of days of research or a flash that hits in the middle of the night.

It's not just floor mats. Consider plastic pot scrubbers, package ribbons, hair-setting tape, surgical masks.

It so happens that these things are related. They are leaves of a technology tree that grew from one man's idea in the late 1930s.

Dick Drew, inventor of Scotch tape (the 3M company is full of legends), developed something called non-woven fiber technology.

His idea spread through the labs at 3M. By 1981, this technology that nobody had heard of was a multimillion-dollar business, responsible for dozens of 3M products.

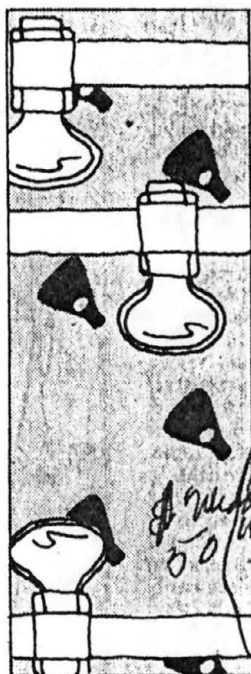
The stuff is so common you probably can't go through a day without encountering the children, grandchildren and great-grandchildren of Dick Drew's brainchild.

If, like in a comic strip, you think of ideas as lightbulbs, imagine a flash above Dick Drew's head. The flash sets off another flash in the building maintenance lab, another in the health products lab, another in the printing products lab.

Each time a light goes off, the inventor moves another step up the corporate ladder and 3M adds another product to its line.

Each time a light goes off, a cash register rings.

If you could shrink 3M and speed



up the decades, the process might look and sound like a pin-ball machine.

There seems to be a 3M knack for taking everyday products made of cloth or steel and figuring out a way to make them from plastic.

Before you know it, you're buying plastic versions of things such as cotton dust cloths. And you're buying them from 3M.

The onslaught started in the late 1930s, when Drew talked William McKnight, head of the company, into buying a machine called a Rando-Webber—a sort of high-speed, chaotic cousin of the loom.

The machine could melt plastic and turn it into fibers. But in-

stead of weaving the fibers into cloth, the Rando-Webber bunched them together randomly, forming a web.

Drew wanted to use webs to make the backing for electrical tape.

The advantage was speed. A webber could produce material 10 to 100 times faster than a loom.

It was considered sort of an odd-ball project, said Hugh Bryce, now vice president of central research. But McKnight agreed to buy the machine.

"Drew had more credibility with McKnight since he started making all this money for him," Bryce said. (Scotch tape, remember?)

There are many variations of 3M history—it's been elevated almost to myth. This, for the most part, is Bryce's version, with some of his colleague's stories thrown in:

In 1925, while Drew was at an automobile factory demonstrating 3M's only product—sandpaper—he saw that workers were having trouble doing two-tone paint jobs. There was no such thing as masking tape, so Drew invented it.

Shortly afterward, Drew was thinking about a new Dupont product called cellophane, and he came up with the idea for transparent tape. He convinced McKnight to pay \$1,200 for a machine to make some.

The product wasn't expected to generate much demand.

"An occasional torn library book doesn't appear to be a very big thing," Bryce said.

Scotch tape was introduced in 1930 and became part of the American way of life.

So when Drew asked for a Rando-Webber to make electrical

Inventions

Turn to Page 4C

Idea planted a 3M technology tree

(Inventions, from Page 1C)

tape, it was hard to refuse. He got the machine, but the project was a failure.

However, in the process of failing to make non-woven electrical tape, some of the backings came out looking nice and shiny. A researcher named Alvin Boese decided to try to make non-woven plastic Christmas ribbon. But the ribbon was weak and dull-looking. It didn't sell.

By 1949, the company was ready to abandon the project. Company officials gave Boese a three-month reprieve to come up with something they could market.

Boese decided he could make the ribbon stronger by bonding yarn to it.

Using a dime-store comb and 40 sewing-machine bobbins, he figured out a way to produce the reinforced ribbon. He experimented with dyes and coatings and developed a ribbon that worked so well that a quarter-million yards of it were sold by that October.

So much for silk bows. 3M Sash-reen ribbon was the thing now. Plastic had secured one more foothold in the world.

Then in about 1956, another of Drew's proteges discovered how to take the flat non-woven fabric into the third dimension. Researcher Howard Hoover figured a way to shape the fibers on molds. The ribbon lab decided to use the process to make non-woven brassiere cups.

After spending about \$10,000 on a machine to make what was to be a cheaper, stronger, plastic brassiere, the project was dropped. According to official 3M history, there was nothing wrong with the product. It was just that the textile companies wanted exclusive marketing rights, which 3M wouldn't grant.

Bryce said what really happened was this: The company tried the new bra cups on 20 volunteers. "No one liked it," he said.

But that wasn't the end of three-dimensional non-woven products.

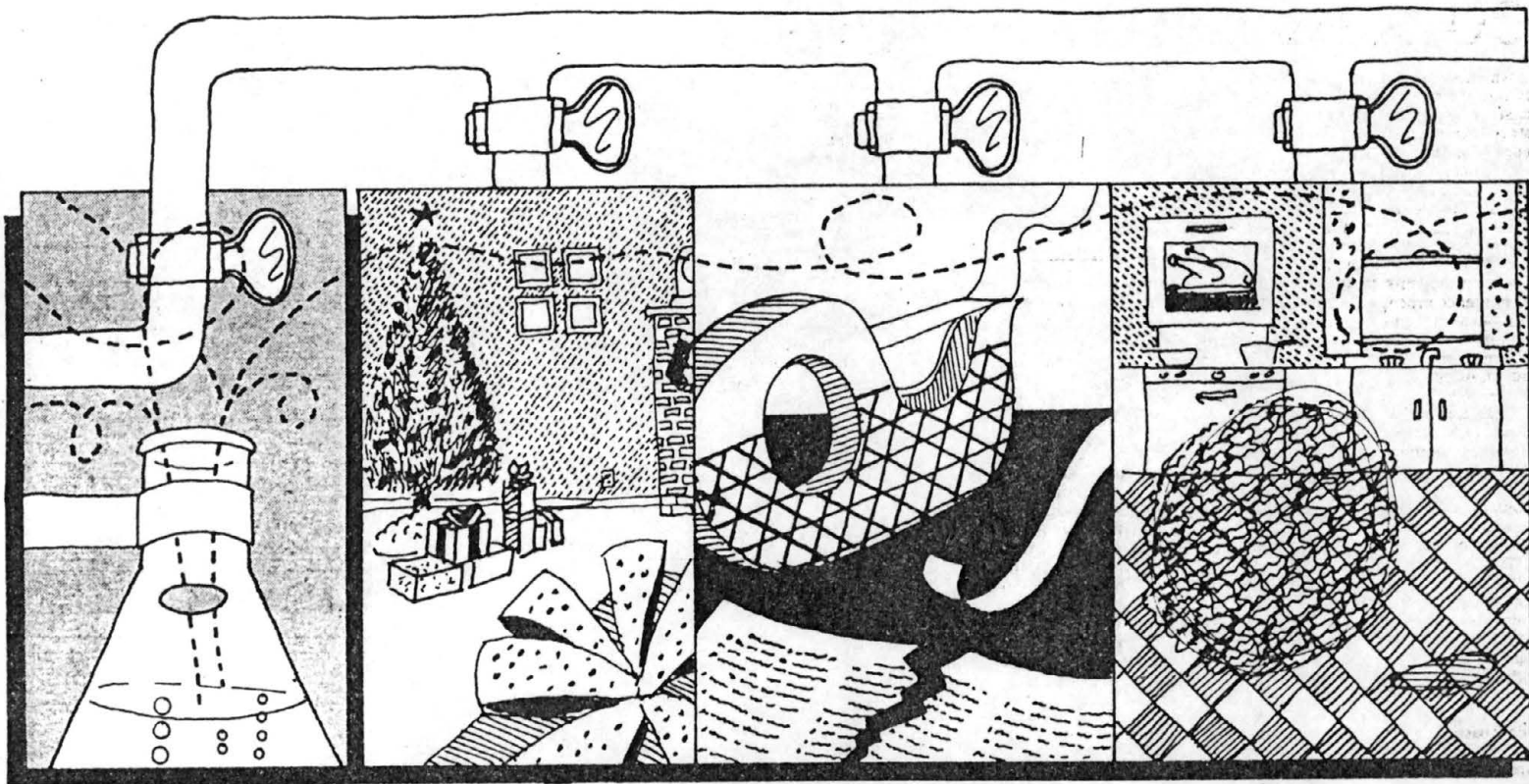
A young chemical engineer named Lewis Lehr had been handling complaints from hospitals that were using Drew's masking tape to bundle surgical tools before putting them into sterilizers. The adhesive was coming off on the tools.

Lehr's boss told him not to worry about it—the product wasn't meant to withstand steaming. "It's just masking tape," he said.

But Lehr bootlegged some research and came up with a new steam-proof tape for the hospitals. As an added attraction, the tape turned color when it was in the steamer so doctors could tell if a bundle of tools had been sterilized.

It was while hanging around hospitals that Lehr was reminded of the unsuccessful bra cups.

In those days, surgeons and



Star Illustration by Todd Grande

nurses wore cloth masks in the operating rooms. What would happen, Lehr wondered, if you took a bra cup, added a nosepiece and a rubber band . . .

The 3M non-woven, disposable face mask was born. Lehr also figured that non-woven surgical tape could be made—the spaces between the fibers would let the patient's skin breathe. A similar version of this Micropore tape is also marketed now for hairsetting.

The idea for surgical masks led to the invention of a plastic replacement for heavy rubber gas masks, which made their wearers look like giant insects.

A chemist named Patrick Carey (who invented a now-defunct product called Flecton—reflective yarn for pedestrian safety) developed the line, which is so specialized that different masks filter different poisons.

In 1971, the Occupational Safety and Health Administration was formed, and started issuing strict limits on levels of dust and gases workers were allowed to breathe.

That same year, the mask experiments became an official project, then grew to a department, then to a division. Last year, the

Health Care Products and Services group had sales of \$499 million.

Carey, who was a chemist in 1944, is a corporate scientist today. Lehr is chairman of the board and chief executive officer of 3M.

Drew's idea kept spreading like a virus, from lab to lab, inventor to inventor.

A researcher named Bob LePage decided 3M should take Drew's web, stick abrasive minerals on it and market a plastic replacement for steel wool.

The new abrasives were to be made of coiled webs of fibers. But the artificial fibers then on the market didn't work right.

That's where Al Matthews came in. He invented fiber-51, and 3M started making pot scrubbers, pads for floor-polishing machines—the whole so-called Scotchbrite line.

"We essentially revolutionized the maintenance of hardwood floors," said Mitsch, lab director at the time.

Scotchbrite floor-polishing pads didn't flake like steel wool, and they could be designed with different strength abrasives, depending on whether the user was stripping a floor or buffing it.

Matthews started experimenting with big coiled webs called "resilops."

"We observed we could make this crazy-looking non-woven," Mitsch said. "But what do you do with it?"

They decided to make them into floor mats.

The first field tests were unsuccessful. Dirt would fall through the spaces in the mat and act like little ball bearings: Step on the mat and it would slip away.

So, 3M officials decided to kill the project. But Matthews wasn't ready to give up. He said he wanted to buy the rights to the process and develop it himself; 3M officials reconsidered.

With a little more time, researchers found the secret. They put foam backing on the mat so dirt wouldn't fall through. Nomad was born.

It was soon found that the mat wasn't durable enough, so different resins were used with the fibers.

"Sure enough," Mitsch said, "a little later a thing called extra-duty Nomad was introduced."

Then customers complained that the mat didn't absorb water.

Researchers figured out how to

make fibers that would soak up water.

Having invented non-woven floor mats, the lab decided to try to make a non-woven, plastic replacement for wire brushes.

Matthews developed a way to make non-woven fibers into something called Thinsulate, which 3M says is two times warmer than an equal thickness of goose down—just the thing to make stylish-looking parkas.

Then, in 1978, Mitsch had a let-down. He was talking to some janitors in Cleveland and realized that despite all his people's inventions, 3M products were still only a small part of the building maintenance field.

Most of the action was still with mops, dust cloths and rags—items used every day.

So Mitsch went back to the lab. "Lo and behold," he said, "we [found we] could make a very effective dusting fabric."

His researchers came up with the Doodleduster. By using little fibers to hold apart big fibers, the duster could pick up more dust than a dust cloth.

"I believe," Mitsch said, "that this is the beginning of a whole new line of dusting products."

Mitsch is now research vice president of a different section of the company—life sciences. Matthews has made his way up the hierarchy from bench chemist to corporate scientist.

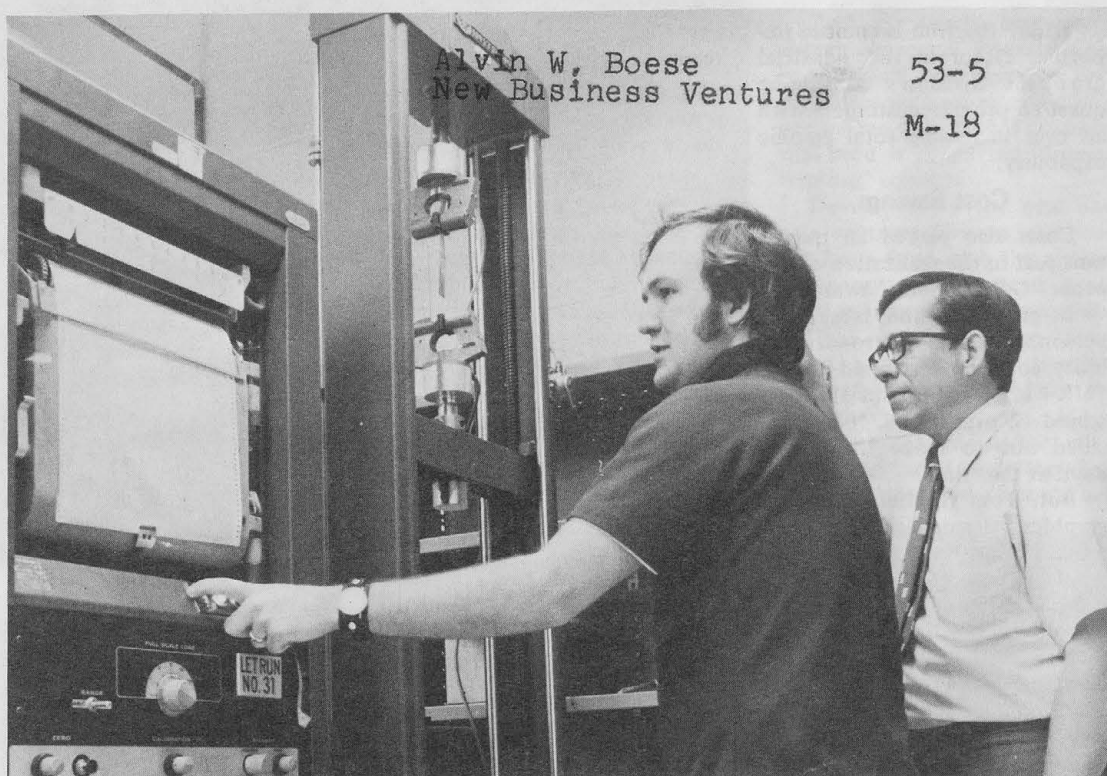
The proliferation continues.

For those hard-to-clean spills, 3M makes Oil Sorbent, a non-woven fabric that absorbs oil but not water. Great for oil slicks, they say.

Recently, 3M's printing lab discovered how to make a non-woven sleeve used to apply water to plates in printing presses. In the past, cloth and paper sleeves were used, but they never worked very well.

In one lab, researchers are toying with non-woven ceramic fibers. Someday they might be used to clean pollutants from factory smokestacks. Fiberglass bags are currently used, requiring gases to be water-cooled first, so the fiberglass won't melt. Non-woven ceramic filters could withstand temperatures above 3,600 degrees Fahrenheit.

"We're looking into that," Bryce said. "These threads keep going through all our work."



Alvin W. Boese
New Business Ventures

53-5
M-18

COMPLAINTS and the products in question are sent to the division's technical service and quality assurance people for analyzing. Above, commercial tape laboratory personnel Dennis Kenefick, left, and Roger Jentink test a tape's adhesive strength.

Product Complaints Need Speedy, Personal Response

Your new car won't start in the morning, your clothes washer leaks water and your tape refuses to unwind from the roll. Being consumers, we all have, at one time or another, been unhappy with a particular product or service we've paid for.

Sales people, as the frontline contacts with customers, are the first to benefit from happy customers and, conversely, are the first to bear the brunt of the unhappy ones.

Considering the magnitude and diversity of 3M products reaching the consumer every day, the Company receives a minimal number of complaints — a result of 3M's outstanding quality assurance. Many of the complaints received result not from a faulty product but from misuse of the product.

Policy Established

But what happens when a complaint is received? How is it handled? Traditionally, most complaints are received in the sales branches. Both the divisions and 3M's corporate customer service department have policies that are put into effect as soon as a complaint is received.

"The important thing," explains Jill Swor, complaint representative, customer service department, "is to give the complaining customer prompt, courteous and personalized treatment. A real problem develops when a consumer complains and receives no satisfaction."

3M's objective is to acknowledge — if not resolve — all customer complaints within five days," emphasizes Swor, adding that "complaint handling is one of the major areas we want to monitor." The customer service department keeps a log of all the complaints it receives and classifies them as to seriousness.

"In addition, we have a follow-up system to insure the consumer does receive an answer," says Swor, noting that more than 60 per cent of the complaints sent to a Company executive are the result of previous unanswered complaints. In the event of multiple complaints on a single product, Swor's area requests details of the problem from the division.

Supervised by Roger Christensen, the customer service department is part of the consumer affairs department headed by Fred M. Metcalfe, vice president.

In their monthly newsletter sent to their coordinators, the customer service department lists the following poor, complaint-handling practices which usually guarantee trouble.

Delays Are Deadly

*Delay in responding to complaints. The natural tendency is to attempt to gather more information before responding to a complaint. However, if a complaint letter is not acknowledged, the customer often interprets this silence as an attempt by the company to evade re-

sponsibility. In such cases, the customer may initiate further action.

*Attempt to shift the blame elsewhere. Aggrieved customers are more interested in knowing what is being done about a complaint than learning who is to blame.

*Use of a form letter response. The use of a form letter depersonalizes contact with the customer at the worst possible time and in some cases may add insult to injury.

*Failure to take corrective action to forestall additional complaints. Too often, companies assume a serious customer complaint is an isolated incident, rather than a warning of a potential product problem.

*Should a complaint prove unjustified, failing to explain the reason for rejection.

Speedy Handling

Generally divisions try to respond to complaints within three days of receipt. Those complaints which are sent to executives or involve a third-party are acknowledged within one or two days. Complaints are tallied monthly and sent to division management.

The original complaint letters along with any returned products are sent to the manufacturing division's product reliance people. This feedback is seen as an opportunity to improve the product or its quality control.

(cont. on p. 3)

Three Divisions Name Marketing Directors

Three division marketing directors have been appointed in the electrical products group. They are Richard C. Ahlberg, electro-products; C. H. (Red) Carter, electronic products; and Marvin A. Cofer, technical ceramic products.

As marketing director, each will be responsible for sales, advertising, market development and planning, and other marketing functions for the entire division.

Ahlberg succeeds Vincent J. Ruane who was named division general manager, and later vice president, following the reorganization of the electrical products group last year into the recording materials group and the new electrical products group.

Beginning his 3M career in 1955 as an electrical products sales representative, Ahlberg held a variety of management positions since then, including that of national sales manager for electrical products. He most recently was general sales manager for the division.

The promotions of Carter and Cofer follow the creation of two new divisions — electronic products and technical ceramic products respectively — last March in the electrical products group. The divisions were formed from the former electronic products department and American Lava Corp., a 3M subsidiary since 1953.

Carter had been sales and marketing manager for the former electronic products department, part of the industrial electrical products division. A veteran of 26 years with 3M, Carter has held several sales and marketing posts. In his new post, he continues to be responsible for expanding the division's electronic packaging business worldwide.

Cofer had been plant manager of the American Lava Corp. plant in Laurens, S.C. since 1970. During his 17 years with 3M, he has gained broad experience in ceramic sales, production and inventory control and manufacturing management.



Ahlberg



Carter



Cofer

Here's A Lifesaving Idea



SAFETY devices like this one, the "3M" brand Ground Fault Circuit Interrupter, could save your life. The device, new from the electro-products division, protects users of electrical tools and appliances from severe shocks and possible electrocution. By sensing a difference between the current entering and leaving an appliance, the device will break the circuit immediately if the currents differ by a hazardous level.

'Sticking Your Neck Out'

Golden Neck Winners Gamble on Success

"Sticking your neck out" is the Anglo way of saying taking a chance or gambling on success. 3M's photographic, printing and nuclear products group recognizes that taking risks is necessary, and recently initiated an award program to honor those who succeed.

First recipients worldwide of the "Golden Neck" award are two teams from industrial graphics for developments which added to the capabilities of the "MR-412" camera plate system. Honored was the team of Frank Price and Berry Smith, and the team of Tom Hoeffel, John Kluge, John Barclay and Norm Marsh.

Global Program

The other "Golden Neck" winners were the management and sales team of 3M Cinema, established in June 1972 as a wholly-owned subsidiary of 3M Germany. 3M Cinema distributes the professional motion picture products of 3M Italy's photographic division.

On presenting the "Golden Neck," E. J. Kane, group vice president and originator of the

award program, praised these 3Mers saying, "In the face of some unusual and very competitive circumstances, these employees set up and achieved goals beyond those normally expected of them. The 'Golden Neck' award is a symbol of our appreciation for their outstanding accomplishments."

To earn their "Golden Neck" awards, Frank Price and Berry Smith together developed a method of utilizing negative film in the "MR-412" system, a breakthrough that eventually was to give that system a more "total graphic capability."

This kind of additional film capability for the "MR-412" system had been considered by the laboratory but set aside because marketing the added film capability did not seem to warrant the development costs.

But Price and Smith, believing in their idea, acquired test films, worked every spare hour they could find, and finally settled on one film with the greatest latitude. They successfully exposed and developed the film in the "MR-412" equipment, recording the procedures and results for the laboratory.

Today the film is another important factor in the industrial graphics division's continuing quest to provide customers with an ever increasing total graphic capability.

Cost Savings

Costs also played an important part in the realization of the other "Golden Neck" awards.

Engineering and laboratory personnel said a halftone capability could be developed for the "MR-412" system but the cost would be prohibitive. It was decided not to make the investment at that time.

But, Tom Hoeffel, industrial graphics salesman in Sacramento, had a customer in Reno who would buy an "MR-412" system if it had halftone capability.

And John Kluge, service representative, had an idea. On his own, he was working on a magenta contact screen that would give the "MR-412" system the desired halftone capability. Results were poor, but it didn't diminish the power of the idea or the determination of the men who were nurturing it.

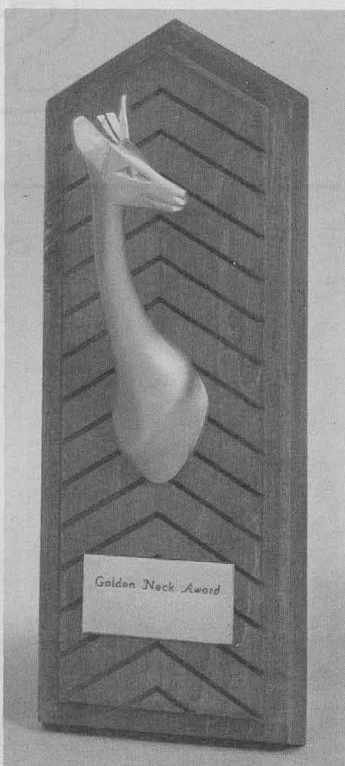
John Barclay, another industrial graphics salesman in the San

Francisco branch, also joined the team.

Soon, a specially-designed prototype was being used successfully by the Reno customer.

John Kluge decided it was time to bring in more technical support and accelerate the project. Norm Marsh, technical service representative, joined in to work out some of the intricate measurements and to design a more foolproof bracket for the magazine.

These teams of dedicated believers had achieved what had initially been thought to be too expensive to achieve. They might have stuck their necks out but it paid off.



digestibles

"The Hijackers," a 20-minute film depicting modern security measures used by motor freight carriers, has been funded by the decorative products division. The film is available at decorative products sales branches for use by government officials, trucking customers, and law enforcement agencies.

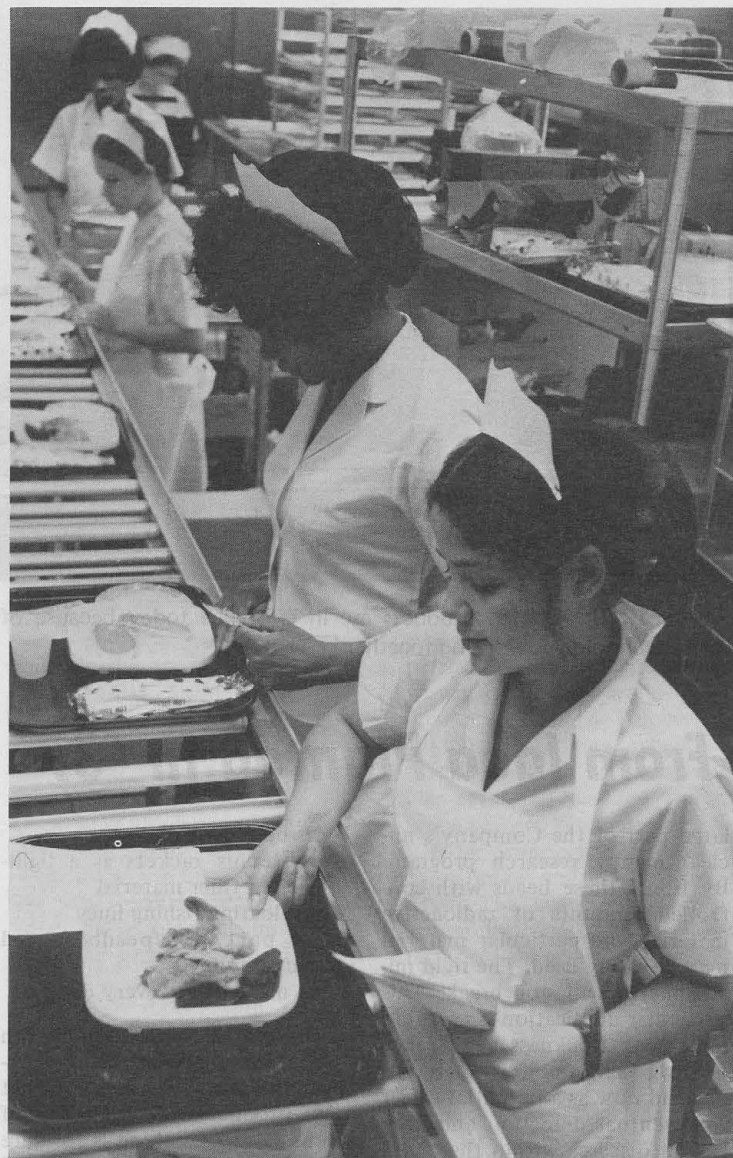
A newly constructed headquarters facility for Sumitomo 3M Ltd., the Company's subsidiary in Japan, reflects the continued worldwide growth of 3M. During the May 7 opening ceremonies, Raymond H. Herzog, president, noted that many 3M products, including sealers, solar control film, non-slip materials, rooftop coatings, interior decorative films and acoustical materials, were used in the new eight-story building.

Ray Engh, industrial tape division marketing coordinator, was recently honored by division management for his masking tape sales achievements while a sales representative assigned to the Chicago branch. Engh was the first sales representative to be named to the 3M Masquers Club three years in succession and was presented an award by L. L. Morin, industrial tape division vice-president. The Masquers club is a select group of industrial tape and automotive hardware trades sales representatives who have recorded outstanding sales of masking tape.

A series of seminars on respiratory care, infection control and the products used in these and related medical areas is being sponsored by the medical products division. Outside medical consultants combine with the division's laboratory and marketing personnel in giving the seminars to hospital staff personnel. The seminars are being presented in major cities across the country and are tailored to the needs of the locality. Exact locations and dates for the seminars are available from the medical products division.

James R. McClintick, vice president, printing products division has been elected to the board of directors of the Graphic Arts Technical Foundation, (GATF), Pittsburgh, Pa. McClintick was elected to a four-year term on the Board during the Foundation's recent annual members meeting held in Pittsburgh. GATF is a member-supported, non-profit, scientific, technical, and educational organization serving the international graphic communications industries: printing, photographic and others.

During the next month 3M's products and services will be on display at some of the following major trade fairs and commercial exhibits: new business ventures and microfilm products divisions will be participating July 11 in New York at the American Library Association Conference; packaging systems and adhesives, coatings and sealers divisions will participate at the July 22-24 Western Packaging Exposition in San Francisco; microfilm products will participate in the National Office Machine Dealers Conference on July 25-28 in Houston.



HOSPITAL food preparation calls for heating and serving a large number of meals in a short period of time. The "Integral Heating" system answered this need while doing it less expensively.

Four Researchers Elected To 3M Carlton Society

Four outstanding scientists have been inducted into the Carlton Society, 3M's "Hall of Fame" for researchers, in recognition of their extraordinary scientific and technical contributions to the Company's growth.

The Society's new members are Ernest J. Duwell, research group manager, industrial abrasives laboratory; Patsy Sherman, new products research manager, chemical resources division; Harold G. Sowman, research associate, central research laboratories; and William A. Vievering, the first 3Mer hired to devote his time to research, now retired.

Announcement of their election was made May 23 at the Tech Forum Annual Event, attended by 3M technical personnel.

Duwell was cited 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. His further work on the chemistry of grinding resulted in important patents and in a new coated abrasives product line.

Sherman is attributed with the development of many of the current "Scotchgard" brand products for textile treatment and is a nationally known authority on textile finishing.

Sowman was instrumental in the development of the nuclear reactor materials program and initiated work in powder metallurgy. More recently, his pioneering in chemical ceramics led to the formation of a new business ventures division program.

Also in the area of ceramics, Sowman's research has yielded transparent ceramic bubbles which are the basis of several divisional product programs.

The First One

Vievering joined 3M in 1916 as the first employee to devote a full-time effort to laboratory work. Vievering established the first quality control department within the Company, developed tests for uniformity and quality, and wrote the original factory standards. W. L. McKnight, retired board chairman and now director emeritus, describes Vievering as the "father of quality control at 3M."

The Carlton Society was founded in 1963 to recognize employees who make significant technical contributions to the Company's growth, and named for 3M's fifth president, the late Richard P. Carlton. This election brings the number of honorees to 47.

3M's 'Hottest' Product Saves Energy Too

Today, nearly everyone is energy conscious. Businesses and individuals are planning their purchases with an eye on energy costs. One way 3M has answered this need is called the "Integral Heating" concept.

Developed by the new business ventures division, the product heats food with the amount of energy other systems waste. Designed for heating and serving chilled, refrigerated or frozen meals, the "Integral Heating" concept was developed for volume, commercial users. Hospitals were picked as the initial marketing target since they have stringent needs which could help

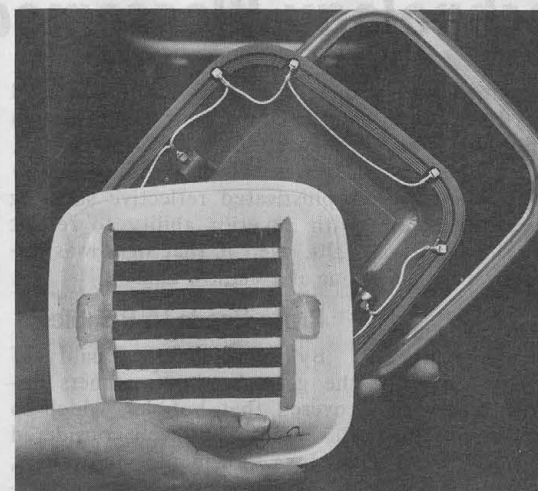
prove the product's effectiveness. Also, spiraling medical care costs along with the rising energy costs combined to place a real burden on hospital budgets.

In a 200-bed hospital, use of the "Integral Heating" food service system can save about 13 million watt-hours of electricity a year, a real savings. Compared to most common heating methods, which are no more than 40 per cent efficient — such as the usual home oven, the "Integral Heating" concept is about 90 per cent efficient. Virtually all of the heat generated goes directly into the food. Even the much publicized microwave

ovens are only about 50 per cent heat efficient.

The "Integral Heating" system uses special dishes which contain their own heat-producing elements. The dishes are heated in an electronically-controlled cabinet-like device that pulsates electrical energy into the dishes.

There are no thermostats, no high oven temperatures, no exposed heating elements and no radiation of any kind. In terms of energy consumption, the "Integral Heating" concept is about twice as efficient as any type of food heating unit on the market today.



THE SECRET of the "Integral Heating" system is hidden on the bottom of the ceramic inner shell of the dish in which food is both heated and served. The dark area on the dish is a special resistive coating which transforms electrical energy into heat.



ELECTRONIC "memory unit" in the "Integral Heating" control module allows different kinds of foods to be heated at the same time, each receiving just the amount of heat it needs.

3M Funds Public TV Special On Alcoholism

A nationwide campaign to provide information and help for the families, friends and employers of America's 9 million "problem drinkers" is being launched in conjunction with a public television special funded by 3M.

Carol Burnett will be hostess of the TV special, entitled "Drink, Drank, Drunk," which will be shown nationally by the Public Broadcasting Service Monday, Oct. 21 (7 p.m., central time). The program will be composed of dramatic and comedy vignettes, original music and discussions of the alcoholism problem by people who have lived through it.

Immediately following the telecast many of the nation's public television stations will switch to live, local programs further illuminating the subject through "hotlines" and expert panels and offering information on available community services.

Participating both on a national and local chapter level will be many leading educational, religious, civic and professional organizations including B'nai B'rith, U.S. Jaycees and the national PTA which have extensive

projects on alcoholism.

3M again will contribute \$250 toward the cost of each local station's related follow-up production, similar to the Company's support in its previously funded public television specials such as "VD Blues."

The show's producer, Charles Hauck, has been researching the program with the U.S. Government's National Institute of Alcoholism Abuse and Alcoholism,

The National Council on Alcoholism, Al-Anon, and various other agencies and independent counselors.

"We're particularly interested in reaching the alcoholic's family with this program," explains Hauck. There has never been a prime time television program to talk to those who live and work with alcoholics and it's as important to help them as it is to help the alcoholic."

Consumer Complaints...

(cont. from p. 1)

An example of this was seen recently with "Scotch" brand sewing tape. Soon after the product was released, the consumer products division received complaints about difficulty in removing the tape under certain conditions. Each complainant was sent a new roll of tape along with further instructions. Followup indicated that some consumers did not understand the removal instructions so the instructions are being revised.

The customer service department, while not receiving all

complaints sent to the branches and divisions, obtains a representative sample. A tally of the complaints is sent each month to Harry Heltzer, board chairman, and Raymond H. Herzog, president, as well as to Robert H. Tucker, vice president, legal affairs, general counsel and chairman of 3M's Committee on Corporate Responsibility.

"We feel that we serve as sort of an ombudsman for 3M," observes Swor. "We want to make sure that the consumer has someone they can easily contact to tell their story."

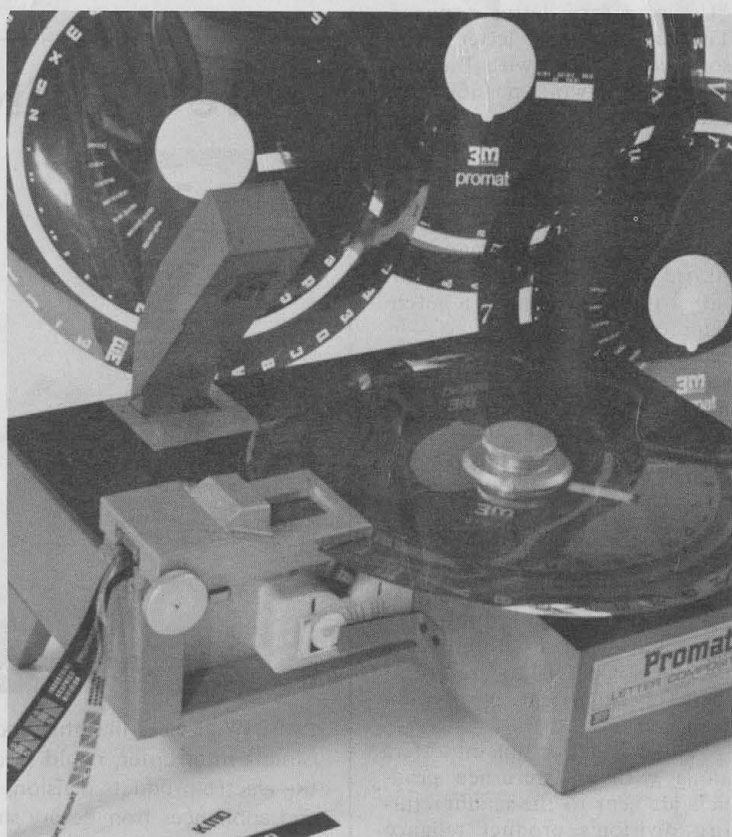
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John Dresler, Editor

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INTERCHANGEABLE Promat discfonts offer creative latitude in "printing" headlines, display art, audio-visual titles, screen printing and labeling.

3M's Package Of Products Tied By Technology

Fred Smith coats ceramic particles in an industrial mineral division plant in Belle Mead, N.J. Bill Himburg sells masking tape to automotive suppliers in Detroit, Mich. for the industrial tape division. Rita Johnson packs surgical face masks in the medical products plant in Brookings, S.D. Harry Carskaden supervises the shipping of reflective sheeting in the Guin, Ala. traffic control plant. Keiichi Miyazaki markets electrical products in Sumitomo 3M Ltd., Tokyo, Japan.

Besides working for 3M, these employees ... typical of 3Mers throughout the Company ... work for different divisions, different product groups, different locations. Apparently their jobs have little in common.

But they do. Each of those persons' job is possible ... along with nearly 80,000 other 3Mers in the world ... because of the research and resulting expertise that have developed in 3M over more than 50 years. That research started with a knowledge of precision coating.

3M's business was originally the "sandpaper" business ... coating and bonding abrasives to flexible backings. Today, that research has moved forward into highly developed technical capabilities in 17 major fields which, when complemented with related products to fill out market demands, has made 3M the 50th largest corporation in the U.S.

Coating and bonding is the process of applying one material to another, such as adhesive to backing (pressure-sensitive tapes), abrasive granules to paper or cloth (coated abrasives), ce-

ramic coating to granular mineral (roofing granules), heat or light sensitive materials to paper, film and metal (copying paper, photographic film and lithographic plates), iron oxide to plastic backing (magnetic recording tape), glass beads to plastic backing (reflective sheeting) and resin impregnated materials (electrical insulating materials).

Every major product group within 3M still relies on the precision coating technology for some of its products. The cross-fertilization and applications of

technical capabilities ... even though producing complete lines of business that are organized into separate groups ... rely heavily on all technologies.

The articles on these pages attempt to take a brief look at how that first coating expertise "spun off" into major segments of 3M's business. Not all the success stories are included but through the use of two of the many examples, these articles show how the current technical capabilities grew to provide thousands of jobs for 3Mers.

Bead Technology Blossomed From Idea Planted In '37

It's a long way from the center line of a highway to the core of a bowling ball. But this is exactly how far bead technology has come within the Company since 1937, when an engineer and his fellow laboratory workers concocted 3M's first reflective product.

This reflective highway center striping was made by covering one side of double-coated "Scotch" brand cloth tape with tiny, glass beads and leaving the other sticky side free for cementing to the pavement. Unfortunately, this was an unsuccessful product. But it led to the development of the very successful "Scotchlite" brand reflective sheeting.

Even though the "Scotchlite" sheeting has gone through several technical refinements since 1939 to bring it to its highly-perfected stage of today, the manufacturing process has remained fairly basic.

First, a waterproof backing is covered with an opaque pigment which will reflect light. Secondly, a coat of microscopic glass beads, perfectly spherical with no imperfections like cracks or bubbles, must be added. The beads are about 60 per cent buried in the pigment during the coating process. And thirdly, pigment and beads are covered with a thin coat of plastic to preserve the reflecting power of the beads and make the sheeting washable and weather resistant.

One of the problems 3M had in making the original sheeting was that the glass beads were coming from Czechoslovakia. The Company soon realized that they would have to stop relying

on the Czechs for beads, and start making their own. Through research and experimentation, 3M was able to produce a very sophisticated reflective sheeting with superior ability to reflect light, even if that light was hitting at a shallow angle.

From Beads to Bubbles

By improving the quality of the glass bead, researchers discovered that bubbles, which to this point had been considered useless, accidental impurities, might also have some commercial value. So they set about purposely creating glass bubbles. It paid off. Today, this off-shoot of bead technology is responsible for successful products in different divisions and departments: traffic control, decorative products, medical products and adhesives, only to mention a few.

The success of reflective sheeting spawned numerous other products and product applications. One of the first of these new products was called a "tympan cover."

This product is used in the printing industry as a sheet on top of the impression cylinder of a letterpress. It had to be soft enough to pick up the irregularities of type, but hard enough to insure a clean, clear impression in print. The 3M version of tympan cover was made by coating glass beads on a special backing. The glass beads served to effectively resist ink buildup, which can interfere with the clearness of the print.

Birth of a Group

This product and its success was directly responsible for the formation of the printing products division. When the new printing products division was separated from its parent reflective products division, it served as the start of the graphic systems group, which now consists of four divisions and the Business Products Sales Inc. (BPSI) organization.

There are really only two types of glass bead: those that are hollow and those that are solid and rigid.

For instance, rigid beads are a

large part of the Company's nuclear energy research program. By filling these beads with controlled amounts of radioactive material, the particular material may be safely used. The rigid microspheres will not break. This particular application is useful in measuring thicknesses ... producing self-luminous materials ... and now as a potential tracer for eventual detection and control of diseases within the body.

Hollow glass beads offer different applications. They can be mixed with adhesives and coated onto the back of a material, like a decal. The beads act as "spaces" which temporarily block the adhesive from coming in contact with whatever it is eventually going to be stuck to. This allows the decal to be positioned properly. Then, by pressing just a little harder on the material, the beads collapse, allowing the adhesive to make contact and take hold.

Keep on Going

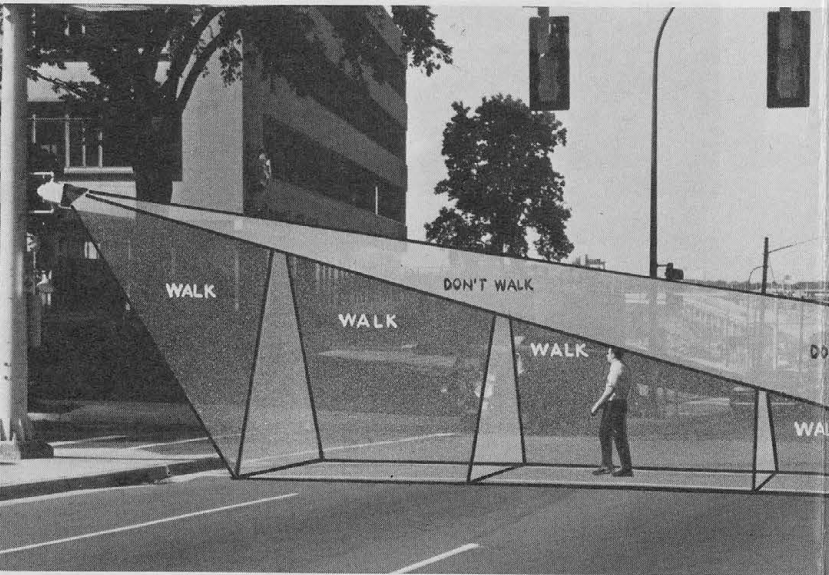
Hollow beads can also be filled with an ink component within a paper web. This is the principle behind "Action" brand carbonless papers. The ink is trapped within the glass bubbles and the bubbles are coated and bonded into the paper. The image is created when the pressure of a pen, stylus or typewriter key breaks the capsules, releasing the ink.

Someone figured out that the fragrance of many different items could be placed in hollow beads and released by breaking them. This led to the "Microfragrance" Scratch 'n Sniff program. This product has now found uses in advertising, education and other areas.

Hollow beads are also used in the manufacture of timed release plant food.

The little glass spheres are finding their way into myriads of products in places you really wouldn't expect to find them.

Today, you can find beads - in the hulls of deep sea diving units - on off-shore oil well rigs for buoyancy - inside furniture as filler instead of wood



TRAFFIC CONTROL products are in existence today because of many technologies working together.

- as bowling ball cores
- in tennis rackets as a lightweight filler material
- in floating fishing lines
- as part of speedboat and barge hulls
- in more places every day

More areas of development in bead technology are being investigated daily. Who knows what new products will come out of them? But one thing is for sure ... 3M won't stop trying to find out.

Development Continues

Nonwoven Products Leave No Loose Ends

The housewife who ties her pretty Christmas packages with "Sasheen" ribbons and bows, scours her dishes with "Scotch-Brite" pads and patches her child's cut finger with "Micro-pore" brand tape doesn't see much relationship in the products. Perhaps the employees who make and sell those products don't either.

But they are related. They exist because two men in one of 3M's earliest laboratories saw the relationship in the technology that it took to make them.

It all began when 3M, then primarily in the abrasive and tape business, sought a better backing for its electrical insulating tapes. Synthetic fibers seemed the best solution, but none of the firms that 3M tried to hire to produce the synthetics could do so.

One of the lab workers on the project, Alvin Boese, was assigned the job of learning the art of paper-making with the hopes that 3M could develop its own way of producing synthetic fibers.

Boese didn't find a better tape backing, but he did develop an interest in non-woven fibers which resulted in a process that enabled them to card and bond fibers. No products resulted, exactly, but there was now a process.

Then one day, while looking at a department store window display, Boese got the idea that his non-woven batting might be suitable for display materials. The material was dyed, and colored flecks sprinkled on it to brighten it up.

In 1944, he slit the material into strips and the 3M ribbon business was born. The product sold ... but modestly. The material did not have enough strength to be cut narrower than two-inches and it did not have enough sheen to give it eye appeal.

The lab had another idea for ribbons, however, and was experimenting with spinning non-woven fabrics. As one of the lab workers, Howard Hoover, was leaving work one evening, he placed a sheet of paper under the spinning head of the machine to keep the material still in it from dropping into the curing oven below and clogging up the oven. The head was loose and swung lazily on a circular pattern over the paper ... the fibers falling onto the paper.

Hoover returned to his bench the next day to find a new product for 3M's ribbon business ... "Lacelon" ribbon ... that looked like lace patterns.

This product, too, was not strong and did not sell well. Worrying that his project was

doomed, Boese decided to try a long shot to make the ribbon stronger. He laid yarn lengthwise on the ribbon and bonded it with plasticizer and heat, using a one-pound spool of yarn and fifty sewing machine bobbins. From a five and ten cent store, he purchased a 10 cent comb and using a make shift set of hot rollers carded the yarn onto a roll of ribbon.

The result was a stronger, more attractive ribbon and the business was on its way.

Today the ribbon technology alone supports several hundred jobs in 3M. But the people working on the project did not take the logical step and stop there once they had a successful product.

Going back to the business it already knew, 3M "married" non-wovens to abrasives (its first product). The non-woven project, which initially was studying backing materials for electrical tape, was re-examined for possible application in the abrasive business. "Scotch-Brite" was the result - today the business of a complete division within 3M, with scrubbing and polishing pads, floor maintenance supplies, industrial polishing materials.

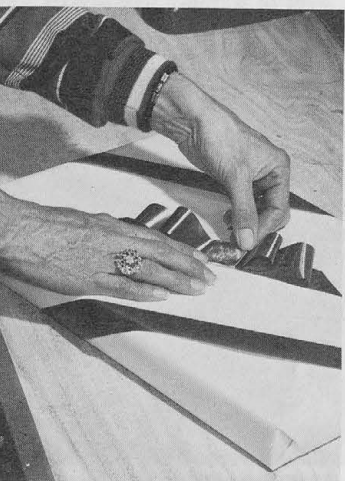
But that was not the end. Printing was next. Dampening sleeves from non-woven materi-

als made offset printing much more economical.

Industrial face masks eliminated inhalation dangers in dusty or dirty work areas.

Then came medical products. The disposable, surgical face masks from non-wovens opened the door to other non-woven products such as wound closures and surgical tapes. In all, the business has made possible a complete product group within the Company.

Nor is the story finished. 3M researchers continue to search for applications of non-woven technology.



NON-WOVEN material technology resulted from decorative ribbon development, left, and has led to many other products including "Oil Sorbent" material, above, used in combatting oil slicks.

3M's Technical Capabilities

Precision Coating

This is one of the Company's earliest technologies, dating from the days when sandpaper was the only product. Today, pressure sensitive tapes, reflective sheeting, recording tape, copying papers, photographic, x-ray and microfilms rely on this capability.

Electrical

Controlling, reproducing and generating electrical impulses allows 3M to offer extensive electrical technology including transmitting, recording, conducting, insulating, and amplifying.

Rubber & Resins

The compounding of rubber and resins is the basis of the Company's adhesives, coating, sealers and molded products.

Films

This technology, combined with additional 3M capabilities, produces such products as x-ray film, microfilm, overhead projection systems, film for windows to reflect or absorb the sun's rays, packaging films and bases for a wide variety of tapes.

Fluorochemistry

The best known example of this technology is "Scotchgard" brand water and stain repellent,

but the field covers much more including acids, liquids, plastics, elastomers, oils, waxes and greases. "Light Water" brand aqueous film forming foam is another important contribution in this area.

Beads

Spherical particles may be ceramic, glass or even wax. They can be used to reflect light, such as in reflective sheeting; or to microencapsulate inks and fragrances which can be released by a slight pressure. They can be carriers for radioactive isotopes for medical research and measuring devices or in dental restorative materials. A new application of beads is in timed-release plant food.

Nonwoven Materials

Decorative ribbons, cleaning and finishing products for the industrial, institutional and grocery trades, filter and surgical masks and microporous tapes, and oil sorbents are examples of non-woven technology.

Incremental Optics

3M's incremental optic capabilities are the heart of the 3M overhead and slide projector systems, as well as important parts of new traffic control and printing products systems.

Paper Making

Capabilities in this area involve the manufacturing of copying, carbonless, microfilm print-out, and electrical insulation papers.

Image Reproduction

3M's imaging technologies have resulted in the marketing of copying machines, overhead projectors, microfilm systems, printing products, and videotape recorders. Related supply items for these systems include copying paper, microfilm, transparencies and print-out papers, carbonless papers, lithographic printing plates, photographic and x-ray film, and videotape.

Ceramics

Ceramic forming technology has produced products including electrical insulators, wear-resistant mechanical parts, and carriers for catalytic converters used in pollution control.

Energy Conversion

These capabilities have resulted in the production of thermoelectric generators which convert heat into electrical energy for use in the space program. Reversing the process, 3M produces systems which convert electrical energy into heat for such appli-

cations as high-performance food preparation and home heating products.

Vapor Coating

Applying vaporized metallic particles to various substances allows 3M to produce recording and decorative tapes, and many other products.

Mechanical Equipment

3M produces highly sophisticated control and measurement instruments for a variety of applications and automatic equipment for the packaging industry.

Educational

3M structures educational information to provide pre-recorded teaching tapes and courses and audio-visual materials for many phases of education and training.

Signing

3M supplies the services and materials necessary for corporate identification such as markings on cars, trucks and aircraft; product promotion or local advertising through all-weather outdoor signing.

Electro Mechanics

3M systems based on this capability include copying machines, microfilm systems, message repeaters, and diverse hardware for many markets.

3M Technical Capabilities	Health Care	Tape & Allied	Photographic, Printing and Nuclear	Advertising Services	Protective	Abrasives, Adhesives, Building Services and Chemicals	Graphic Systems	Recording Materials	Electrical	New Business Ventures Division
Precision Coating	●	●	●	●	●	●	●	●	●	●
Electrical	●		●				●	●	●	●
Rubber & Resins	●	●	●	●	●	●	●	●	●	●
Films	●	●	●	●	●	●	●	●	●	●
Fluorochemistry	●	●			●				●	
Beads	●	●	●	●	●	●				●
Non-Woven Materials	●	●	●	●	●	●				●
Incremental Optics			●	●		●				●
Paper Making	●	●	●			●			●	
Image Reproduction	●	●	●	●	●		●	●	●	
Electro Mechanics	●	●	●	●	●	●	●	●	●	●
Ceramics	●		●						●	●
Energy Conversion	●	●	●	●	●				●	●
Vapor Coating	●	●					●			
Mechanical Equipment	●	●	●	●	●	●	●	●	●	●
Education	●	●				●	●			
Signing		●		●					●	

COATING AND BEAD technologies led to "Scotchlite" reflective materials, right, and printing products, above, among dozens of other success stories.

Need for Microfilm Increases As Paper and Space Decrease

Paper, like oil, comes from the raw material only Mother Nature can provide. What that means is obvious in these times of raw material shortages. While the answer to the oil shortage is not yet at hand, an answer to the paper shortage is already here. It's microfilm.

Speaking at the recent National Microfilm Association conference in Boston, D. W. McArthur, vice president, microfilm products division, said paper-saving techniques had been technologically and economically feasible for more than 10 years, but neither has realized its full economic potential be-

cause the microfilm industry has not given its best efforts to see that they do.

"Here and now, there are two areas of microfilming which can save paper — two areas ripe and ready for the doers: micropublishing and COM (computer output microfilm) the greatest paper saver of all."

"Can industry really visualize what micropublishing means in terms of storage?" he challenged, "noting that a publisher with a hundred different books (averaging 300 to 350 pages each) would need 27,000 cubic feet of warehouse space to house 5,000 copies of each in regular

hard bound printed form.

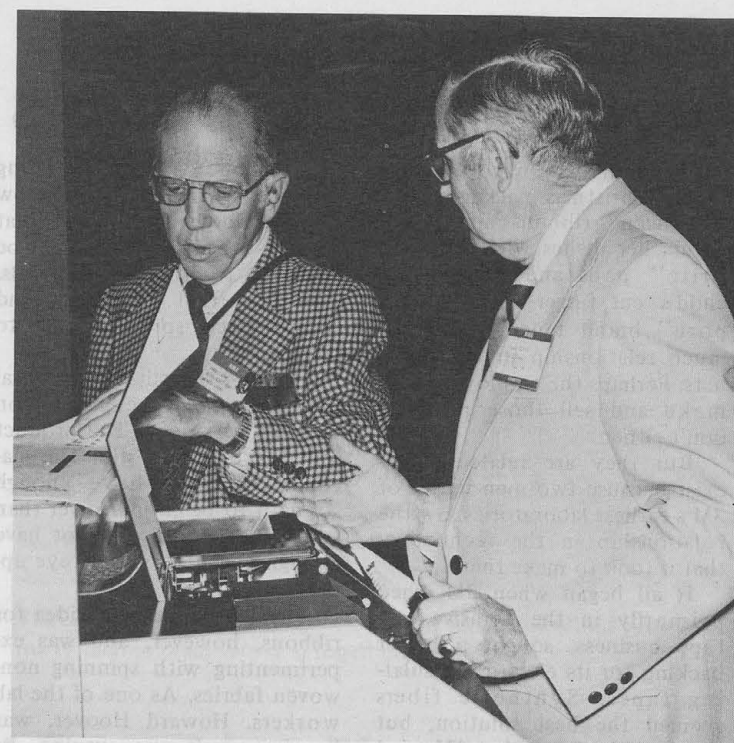
"That would take up nine or ten stories of a hotel," he commented, "whereas that same stock in microfilm form would use but one single room: 540 cubic feet. One fiftieth the need!"

An average hard bound volume costs about one dollar to produce, compared to the microfilm cost of seven cents, he added. The books would cost three times as much to ship as the microfilm, at less preferential service rates.

Tons of Savings

"As for COM, granted it is not for everybody," McArthur said. "It is not cheap and it's related only to computer output. But, for industrial firms, government offices, banks and utilities that literally put out tons of computer paper each year, it offers a tremendous advantage. With COM, there is paper only when necessary."

Much data need never get to the paper stage, he added; it can be accessed by using a reader. "And COM-produced microfilm can be mailed wherever needed. Distribution cost savings hold true for COM as they do for micropublishing. But the opportunity for COM to go places existed without the paper crunch, and now its horizons are unlimited."



MICROFILM PRODUCTS division marketing representative Edward J. Reding, right, talks to one of the more than 10,000 customers and dealers attending the NMA conference.

Over ten thousand participants attended the annual NMA conference, which had more than 100 exhibitors. Microfilm products' recently introduced Laser Beam Recorder was the main feature of 3M's booth. A demonstration and multi-media presentation on the LBR was presented four times an hour to standing-room-only audiences in a 30-40 person mini-theater. The full line of readers, reader-printers, cameras and accessories was also demonstrated, both on the floor of the show as well as in private suites in two nearby hotels.

A compact microfilm processor, incorporating an automatic threading feature, was shown for the first time by the photographic products division. And the facsimile products department exhibited its versatile remote copier, a facsimile unit that can send and receive material over conventional telephone lines. Others participating in the conference were photographic products and industrial graphics divisions and the facsimile products department.

The industrial graphics division introduced the first in a

new line of microfilm/printing platemakers. The unit combines the division's existing technology of an "MR-412" Camera Plate System, plus a microfilm head to automatically produce offset plates at a rate of four per minute.

A compact microfilm processor, incorporating an automatic threading feature, was shown for the first time by the photographic products division. And the facsimile products department exhibited its versatile remote copier, a facsimile unit that can send and receive material over conventional telephone lines.

Two Promoted In National Ad Reorganization

Energy Systems Project Formed

Development of new systems and ideas for the accumulation and conversion of energy is the objective of a new project that has been formed within the electrical products group.

Lewis J. (Jim) Schoenwetter has been named manager of the new Energy Systems Project which will be made up of the personnel, technologies and energy conversion expertise of the thermo-electric systems business of the electro-products division.

The project will concentrate on the development of new concepts of energy from existing fossil fuels, nuclear fuels and natural environmental forces which are relatively unused today to supply electrical and mechanical energy needs. Storage of energy will be another major consideration in the project's program.



Schoenwetter



Olney



Murray

SALES DIGEST

Sales, Marketing New Assignments

B. E. Bell — to sales manager, specialty trades, commercial tape division.

Charles D. Benes — to BPSI duplicating manager, duplicating products division, eastern seaboard region, Arlington.

M. D. Benson — to utility market sales manager, electro-products division, San Francisco branch.

Gale R. Billard — to market planning manager, TelComm department, electro-products division.

Michael R. Brown — to order department supervisor, Dallas branch.

Jack F. Cleary — to sales manager, construction and industrial maintenance markets, electro-products, St. Louis branch.

R. H. Cole — to Eastern Region sales manager, commercial tape division.

Paul M. Daprato — to BPSI branch operations manager, Washington, D.C.

A. A. DeRosa — to BPSI sales manager, duplicating products division, Los Angeles.

William C. Hagmeier — to sales manager, construction and industrial maintenance markets, electro-products, St. Paul branch.

Jerome H. Hendrickson — to sales manager, data recording products division, San Francisco branch.



Cole



Daprato



DeRosa



Hagmeier



Hendrickson



Ivey



Kriebel



Lee



Lewis



Maple



McDermott



McNally



Miller



Moore



Odum



Parady



Rogers



Roles



Shillington



Wood

Benjamin Ivey — to special services manager, Central region, Dallas.

Eugene T. Kriebel — to BPSI duplicating sales manager, Harrisburg.

Robert E. Lee — to sales manager, construction and industrial maintenance markets, electro-products, Philadelphia branch.

M. E. Lewis — to branch credit supervisor, High Point branch.

Arthur L. Maple — to eastern area sales manager, utility markets, electro-products division, Philadelphia branch.

James J. McDermott — to sales manager, metal protection products, electro-products division.

John P. McNally — to market manager, medical services, medical products division.

John Miller — to distribution operation manager, Southern region, Tampa.

Franklin J. Moore — to BPSI facsimile sales manager, South-

east region, Atlanta.

William M. Odum — to utility market sales supervisor, electro-products division, Atlanta branch.

Kenneth T. Parady — to utility market sales supervisor, electro-products division, Cleveland branch.

D. Gary Rogers — to sales trainer, West Coast Business Products Training Center, Comp-ton.

Roger Roles — to BPSI branch service manager, Atlanta.

R. A. Shillington — to branch

sales manager, medical services, medical products division, Cleveland.

Gary E. Wood — to market coordinator, dental products project, medical products division.

International, U.S. Sales People Share Sales, Marketing Strategies

Joe Tyrrell and Jean-Francois Hepp had just struck gold. They weren't shouting and telling the world about it. But excitement of discovery showed in their eyes and the way in which they exchanged brief, mutually understood words and quickened the pace at which they moved.

The gold, in this instance, was boxes — hundreds of boxes of all sizes and shapes. Not the kind of discovery to excite the average person, but a rich find for two prospectors looking for new customers for 3M's young packaging systems division.

Tyrrell and Hepp were being taken through the warehouse of a large mail-order house in Chicago by the firm's packaging engineer.

For Tyrrell, then a specialist for in-house packaging systems at 3M's Chicago sales branch, it was a call on a potential customer as part of his regular day's work. He was finding out about the customer's packaging needs so he could devise a program to meet them.

For Hepp, product manager for packaging systems and tape customer engineering at 3M France, it was a field visit as part

of a month's training in the United States.

Theoretically, Hepp was along as an observer — to study the approaches used in selling packaging systems in this country and to learn more about potential customers and product applications. Actually, his visit with Tyrrell evolved more into a situation where two people with a common purpose were working together and sharing the satisfactions and frustrations of trying to sell a customer a product.

That bond is emphasized by veteran international staff people like Ralph Pohland, group international marketing executive for tape and allied products, and Frank Zoccola, director of international marketing for abrasives. Both also have had long experience in U.S. sales and marketing.

Hepp was one of several dozen sales and marketing people in all product lines from 3M's international companies who spent time in the field last year with sales representatives and specialists at 3M's U.S. sales branches or branches of 3M Business Products Sales Inc.

It is a long-standing practice

and a means by which global sales and marketing expertise, as well as common objectives, is developed at 3M.

For both parties, it can broaden horizons. Tyrrell, who recently transferred to St. Paul to become a marketing coordinator in the commercial tape division, was particularly interested in learning about the marketing methods used in France and in getting Hepp's insight and his reaction to how products are marketed in the United States.

"It's always helpful to find out the approaches someone else takes to what you're doing," Tyrrell said.

Hepp visited the United States to learn more about how the U.S. packaging systems division operates in preparation for setting up a packaging systems marketing organization in France. Packaging systems there has been part of industrial tape, as it was previously in the United States.

"What we see here is probably what we will have in the future in France and Europe," he said during his visit. "That is probably the most value to me of this trip. But the fact that we



A GOOD TEAM, salesmen Jean-Francois Hepp, left, from France, and Joe Tyrrell, Chicago sales, share sales techniques as part of 3M's international sales training program.

are able to see how things are done here also enables us to evaluate, by comparison, the programs we have now in our countries."

Hepp found a basic similarity between the methods in France and in the United States. The differences are mainly of size.

The international companies initiate most requests for field trips — usually when they are about to launch a major new program patterned after one in the United States or when they

have people with newly assigned broad responsibilities for a product line.

Besides studying marketing and selling methods, the visitors may want to learn more about branch operations, specific industries, technical applications, or distribution patterns.

As Zoccola said, "Better communication and better understanding improve our ability to solve problems so that we can compete in markets on a global scale."

July Service Anniversaries

3M salutes these employees who will observe service anniversaries in July. The number following each name indicates the day that person will observe his service anniversary. This is to enable friends to acknowledge the anniversary day.



G. Dolce
West Caldwell
35 years (5)



O. W. Hitzemann
Los Angeles
35 years (20)



J. W. Griesse
West Caldwell
30 years (15)



M. J. Musto
Chicago
30 years (12)



R. F. Harrison
Atlanta
25 years (1)



V. H. Bax
Dallas
20 years (5)



V. T. McCarthy
Minneapolis BPSI
20 years (11)



C. F. Merrill
Chicago
20 years (12)



G. T. Swerzenski
Paramus BPSI
20 years (13)



J. L. Larsen
traffic control
15 years (6)



J. W. Sornberger
St. Paul
15 years (27)

25 YEARS

P. P. Kruks, Detroit sales (19)
J. S. Percival, St. Louis sales (1)

20 YEARS

W. M. Pence, Dallas sales (13)
G. B. Peterson, St. Louis sales (9)

15 YEARS

L. H. Anderson, National Ad (14)
C. L. Bernhardt, National Ad (1)
D. G. Clark, Trenton BPSI (15)
A. J. Eggert, St. Louis sales (27)
J. I. Forman, Los Angeles sales (20)
J. L. Harrison, West Caldwell sales (6)
W. F. Huff, San Francisco sales (20)
C. J. Kubes, Chicago sales (13)
D. D. Parker, Fresno BPSI (6)
B. Price, Paramus BPSI (13)
A. P. Rill, National Ad (20)
R. O. Schmid, West Caldwell sales (1)
K. L. Thomas, Seattle sales (22)
F. T. Vanmeter, National Ad (20)

3M Growth Generates Unlimited Opportunities

Part of 3M's growth each year involves increased numbers of new employees. However, another form of employee growth, often overlooked, also is made possible when 3M's sales and earnings increase, new operations and product research are invested in and operations expand throughout the world.

This growth comes in the form of self-development: the ability of the employee to progress upward within the ranks of the Company. It is this opportunity for advancement which clearly reflects the value placed on the people who make up the 3M organization and are responsible for its success.

Chain Reaction

In 1973, for example, 12 executive retirements were announced. A "chain reaction" occurs when this happens: someone replaces the executive; someone else replaces the replacement, and so on. Raymond H. Herzog, president and chief operating officer, notes that several promotions usually result from a retirement of one executive.

This is multiplied many times when we consider the other promotions, retirements and transfers within the organizations.

Statistics from personnel services department show that 346 new managers were named in 1973 and that only 82 of those were for replacement purposes. The Company's organization and manpower development people estimate that in the next six to seven years, 3M will need 2,947 new managers to help run the Company's growing business in the U.S. alone. Of this number, only one-third will be for replacing current managers.

Improve In Their Job

If you are like most employees, you want to get ahead. A few individuals are content with their present lot in life or will be satisfied with whatever comes their way. But the majority would like to be better off than they are, by doing their job better, by getting a better job, by earning enough to enjoy more of the "finer things of life." They

know that this might happen as a result of just plain good luck, but most really know that the better and surer way of getting ahead is to improve in their present job and become recognized as having the capacity to handle a bigger job.

This year, as in years past, employees at 3M are going to be active in self-development — first, getting better in a given task, thereby demonstrating capabilities, and then preparing in the areas that will be necessary

in the next job desired. The whole process of self-development is usually preceded by three events.

See Yourself As You Are

First, you have to see yourself as you really are. This doesn't mean that you're not very capable already, but it does mean that you have to honestly evaluate your own strengths and weaknesses. Then make up your mind as to what you are interested in. Another good way to find

out where your strengths and weaknesses lie is to "tune in" on the way other people read you. This sometimes has as much to do with an opportunity you are offered as your appraisal of yourself.

Secondly, when you look at yourself and your situation, you must be discontented with what you see. You needn't be totally dissatisfied with yourself, but you must want to move on to something better.

Finally, you have to have an

image in mind of what you want to be, and be willing to put out the effort to make it. Sometimes this goal is long range — something you want to be at the peak of your career. Other times, you may only be able to see the next job to which you want to advance. But whatever the motivation, it's enough just to have something tangible out ahead for which you are striving to reach.

If you have this goal and are willing to work toward it, you should declare your intentions and desires to your boss and ask for help. By talking it over with your boss, you may learn where and how you can improve yourself on your present job, and what the next job you have targeted really involves.

Beyond the possibilities of moving up within your present group or division, the 3M Personnel Inventory exists to help locate the best qualified people anywhere in the Company when specific job opportunities open up. Those individuals listed in the Inventory have already been recognized by their bosses as being ready to move to the next level.

Not all promotions occur through the Personnel Inventory, of course. About one out of four does. The other three take place right within a Company unit, where an employee has groomed himself for the next job level. Such a job becomes open, and he is obviously the best candidate to fill it, so he gets it.

Personnel Inventory Finds People For Positions

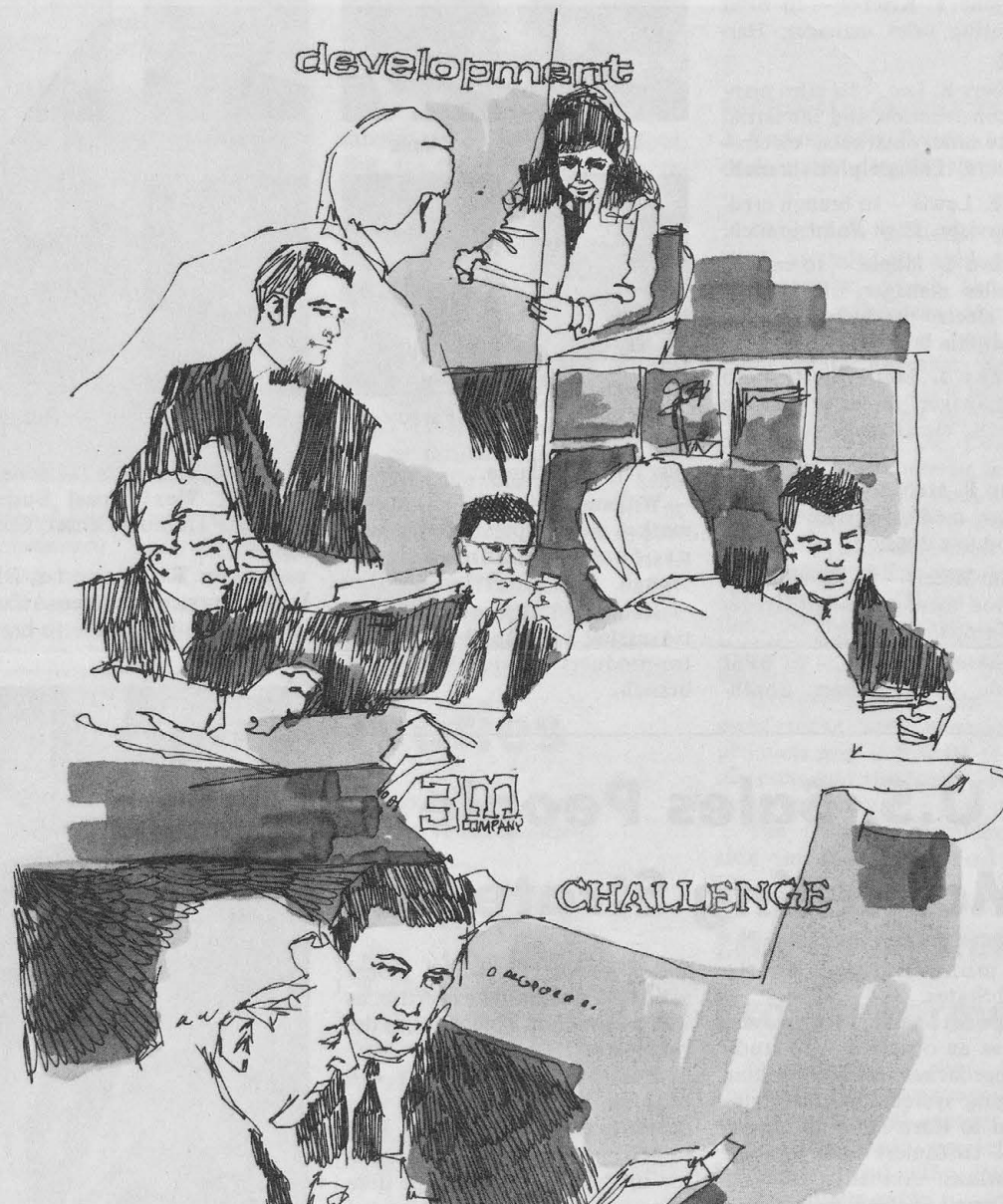
The Inventory approach is used, however, when the boss, having an open job, looks around his organization and doesn't see a suitably qualified candidate, or he does see a possible candidate but wants to be sure there isn't one available somewhere else in the Company. He then requests an Inventory search.

Of the more than 700 total supervisors and managers named in 1973, 80 per cent moved within their department or division and the remaining 20 per cent were inter-divisional moves. Last year the use of 3M's personnel inventory spurred as some 333 new job searches were run among the 7,725 personnel in the inventory.

Half of the top people at 3M have received at least one advancement in their careers due to an Inventory search having been requested and made.

And at the rate 3M has been growing, this year should find new job opportunities and chances for advancement opening up.

(Reprints of the complete "Concept of Personnel Development at 3M" are available from the Sales Digest, Bldg. 220-6W, 3M Center, St. Paul).



Two Salesmen Join Elite Corps

Two more sales representatives have been named to the elite sales group of account executives. Dean Booth, consumer products division, and William Graham, adhesives, coatings and sealers division were named ac-

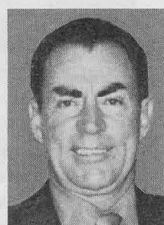
count executives in February.

That position, first established in June, 1971, recognizes exceptionally qualified members of 3M's sales force. Recommendations for that rank must be made by the division marketing director, then approved by the division vice president, the appropriate group vice president, and finally the vice president of marketing for the Company.

Booth joined 3M in 1956 in the former retail tape and gift wrap division. He has held increasingly responsible sales positions in both that division and the consumer products division

and has produced outstanding results, according to national sales manager E. A. Dawson. Booth is located at the Los Angeles sales branch.

Graham works out of the Bristol, Pennsylvania, sales branch and has been with 3M since 1952. His past assignments include responsibility for all aerospace accounts in the Eastern United States and since 1968 the additional duties of Canadian aerospace accounts. Most recently he has handled the additional activities of automotive manufacturing facilities on the East Coast.

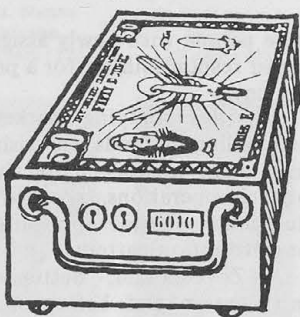


Booth



Graham

Safety deposit.

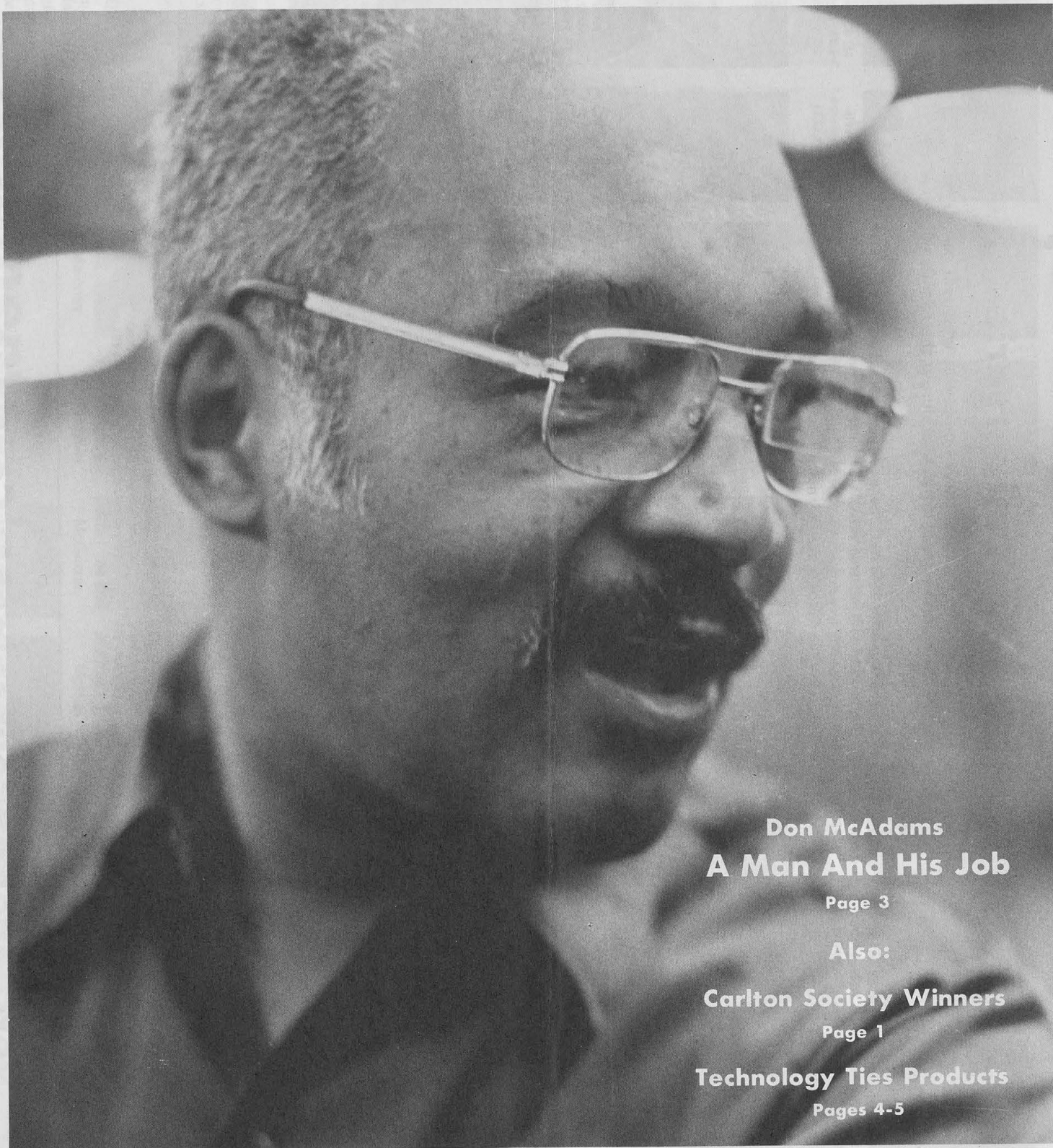


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Megaphone

3M
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JUNE 1974
VOL. 14 NO. 6



Don McAdams
A Man And His Job

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Also:

Carlton Society Winners

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Technology Ties Products

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Photo by Ed Fastner

Baby's Adoption Speeded By Unusual Twist of Events

It was an unusual twist of events that finally assured Paul's arrival in St. Paul recently after numerous delays.

Paul, who was born in Korea 15 months ago, is being adopted by Kathleen and Ron Strasser, an engineering analyst in hard goods manufacturing.

The Strassers first applied to adopt a Korean baby in November of 1972. After nearly a year of waiting, they were told that a baby had been found. "All of the necessary papers were taken care of (in this country), we sent our money and then we began our wait," said Mrs. Strasser.

The wait turned out to be a long one because they ran into delay after delay in getting the necessary paperwork from Korea.

The first real break occurred on a cold evening in February when Strasser met Larry Schmidt, a technical service representative in 3M's safety systems department.

Schmidt told him about a machine he would be working on over the weekend — a machine that he would be taking to 3M's office in Seoul, Korea Monday morning.

"My husband was really excited," Mrs. Strasser said. "He told Larry that we had a little boy in Korea that we had heard no word on at all."

Schmidt then asked for the name of the orphanage and agreed to see what he could find out. He even offered to bring the baby back with him if all the paperwork could be completed in time.

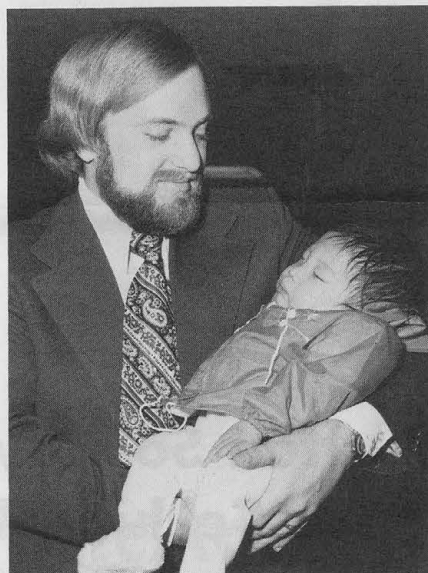
Once Schmidt had boarded the plane Mrs. Strasser called Sen. Hubert Humphrey's office, told them that a friend would be in Korea and asked if they could help speed the paperwork up.

"In two hours time, Sen. Humphrey's office called us back to say they talked with Immigration and that the United States had decided to issue a visa approval to Seoul without waiting for any further papers from Korea," Mrs. Strasser said.

While in Korea, Schmidt repeatedly contacted the U.S. Embassy and even arranged to visit with the baby and take pictures of him.

"His presence made all the difference," said Mrs. Strasser. "Arrangements were made for our baby to come immediately to Seoul... to ready him for travel to the U.S."

A slight hitch developed and Schmidt was not able to bring the baby back to the United States with him. But Paul did arrive shortly thereafter.



AMONG THE FIRST to hold the baby was Larry Schmidt, who did so much to help make his arrival possible.



ADMIRING their new baby are Ron and Kathy Strasser, and a young relative. The Strassers also have a 14-year-old daughter and a two-year-old son.

Outstanding Scientists

Four Named To Carlton Society

Four outstanding scientists have been inducted into the Carlton Society, 3M's "Hall of Fame" for researchers, in recognition of their extraordinary scientific and technical contributions to the Company's growth.

The new Society members are Dr. Ernest J. Duwell, research group manager, industrial abrasives laboratory;

Patsy O. Sherman, new products research manager, chemical resources division; Dr. Harold G. Sowman, research associate, central research laboratories; and William A. Vievering, the first 3Mer hired to devote his time to research, who is now retired.

Announcement of their election was made May 23 at the Tech Forum Annual Event, attended by 3M technical personnel.

Duwell was cited 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. His further work on the chemistry of grinding resulted in important patents and in a new coated abrasives product line.

Mrs. Sherman is attributed with the development of many of the current "Scotchgard" brand products for textile treatment and is a nationally known authority on textile finishing.

Sowman was instrumental in the development of the nuclear reactor materials program and initiated work in powder metallurgy. More recently, his pio-

(cont. on p. 2)

Employee Recreation Program Recognized As Outstanding

3M's employee recreation program has received a prestigious award from the National Industrial Recreation Association (NIRA).

The program was cited for providing "outstanding opportunities for mental, physical and social development of employees and families." The award was sponsored by the Citizens Savings Athletic Foundation and given through the NIRA.

"This award means our program has been recognized as one of the best in the world," said John Leslie, industrial recreation manager.

To receive this award, a program must be well rounded, appealing to both sexes and available to people of all ages

and job classifications.

Leslie noted that 98 per cent of all St. Paul area employees are involved in the 3M Club program.

"3M management has always recognized the value of this program and been actively involved in it," Leslie said. "We could never have a program like this without their support."

In explaining 3M's thoughts about employee recreation, Tartan Park manager Ed Bruno said the Company has found that "good recreation programs attract good employees and help retain them. These programs appear to have a positive effect on productivity as well as on job attitudes, actually creating a more stable, satisfied work force."



PRESTIGIOUS AWARD was won by 3M for its employee recreation program. Standing alongside the plaque are Ed Bruno, left, and John Leslie. Photographer Ron Winch used a wide angle lens to achieve the special effects.

3M Funds Public TV Special On Problems Of Alcoholism

A nationwide campaign to provide information and help for the families, friends and employers of America's nine million "problem drinkers" is being launched in conjunction with a public television special funded by 3M.

Carol Burnett will be hostess of the TV special, entitled "Drink, Drank, Drunk," which will be shown nationally by the Public Broadcasting Service Monday, Oct. 21 (7 p.m., central time). The program will be composed of dramatic and comedy vignettes, original music and discussions of the problem by people who have lived through it.

Immediately following the telecast many of the nation's public television stations will switch to live, local programs further illuminating the subject through "hotlines" and expert panels and offering information on available community services.

Participating both on a national and local chapter level will be many leading educational, religious, civic and professional organizations including B'nai B'rith, U.S. Jaycees and the national PTA, which have extensive projects on alcoholism.

3M again will contribute \$250 toward the cost of each local station's related follow-up production, similar to what the Company had done in its previously funded public television specials on social issues such as "VD Blues."

Producer Charles Hauck has been researching the program with the U.S. Government's National Institute of Alcoholism Abuse and Alcoholism, The

National Council on Alcoholism, Al-Anon, and various other agencies and independent counselors.

"We're particularly interested in reaching the alcoholic's family with this program," explains Hauck. "There has never been a prime time television program to talk to those who live and work with alcoholics and it's as important to help them as it is to help the alcoholic. In fact helping his family may be a way to help him."

"People who have to deal with alcoholics can find some common sense advice in this program."

Service Awards Banquet Slated

The 1974 St. Paul area Service Awards Banquet will be held Saturday evening, Sept. 21, at the St. Paul Civic Center. The dates are being announced at this time so recipients and their guests can plan accordingly.

All area employees are invited as honored guests in the 15th year after they joined 3M, and every five years thereafter.

Additional information will be published in future issues of the "Megaphone."



PEOPLE showed up by the hundreds as Eastern Heights State Bank staged a special promotion. For a 50 cent contribution to the Minnesota Sheriff's Boys Ranch they feasted on hamburgers and baked beans. Chefs included bank personnel and local personalities. Eastern Heights is a 3M subsidiary.

Around 3M

Three transportation department employees have been named winners in the first segment of that department's "Operation Results" program. Winners were Lyle Cater, operations supervisor; Muriel Fees, secretary; and Thomas Jorissen, distribution coordinator. Cater was honored for developing a back-up fuel system for the private truck fleet during the gas shortage; Ms. Fees for continually providing assistance in addition to her normal duties; and Jorissen for developing a program to ease the rail car shortage in shipments from roofing granule plants.

John A. Pendergrass was elected president of the American Industrial Hygiene Association at the professional organization's annual meeting in Miami Beach, Fla. He is associate director of 3M's medical department.

Five more employees have graduated from the apprentice training program. The program, which lasts from four to five years, includes on-the-job training and night school at the St. Paul Technical Vocational Institute. Recent graduates include Richard Cameron and John Larson, both steamfitters in the maintenance shop; Robert Helm, systems control technician, maintenance shop; Bruce Jones, electrician apprentice, maintenance shop; and Albert Schaefer, electrician, maintenance shop.

David Remus was a top winner in the National Packaging and Handling Competition of the Society of Packaging and Handling Engineers. His entry — a dual purpose plastic package for a microfilm reader-printer — won third place in the plastics category. His winning package is now eligible for the Northstar Packaging Competition in Chicago next October. Remus is a packaging engineer, purchasing.

A 3M booth won an award for the best design at the recent Midwest Beauty Trade Show. On display at the booth was the commercial tape division's line of "Beauty Mark" professional salon products. Product merchandiser Mary Kjos accepted the award.

3M ranks 50th in size, based on 1973 sales, among the nation's industrial firms, according to the May issue of *Fortune* magazine. The magazine's annual listing of the 500 largest, publicly owned U.S. corporations was published in its May issue. 3M's new position is one up from a year ago and is an all-time high. Other 3M ranks for 1973 are 31st in the number of employees, up from 35th a year earlier; 21st in net income, down from 17th; 45th in assets, up from 49th; and 22nd in net income as a per cent of sales, down from 17th.

3M Megaphone

Vol. 14 June 1974 No. 6

Jane Boulware, Editor

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Golf Lessons...

Husbands and wives of employees who are interested in taking weekday golf lessons at Tartan Park should call Jon Fosselman, teaching pro, at 739-3828. Please leave your name and number. If enough interest is shown Fosselman will begin such a session.

Deaths Noted

James E. Adamson, 37, technical instructor, technical training center, died April 16.

James Maggi, 23, coating machine operator, tape plant, died April 28.

Frank P. Springer, 51, baler operator, abrasives plant, died April 22.

Mendall Thompson, 46, supervisor, patents and profiles, corporate technical planning and coordination, died April 28.

Broad Research Usage Leads To Promat Project

Broad application of the magnetic audio/video products division's research efforts has resulted in the Promat Project. A research team, supervised by Peter Vogelgesang, has invented a compositing system which reduces the time and cost required by present systems to produce ready-to-use letters and numerals.

The "3M" brand Promat compositor "prints" crisp, dry, letters for headlines, display art, audio-visual titles, screen printing and labeling.

Heat, created by short bursts of light, transfers images from a master font on to two strips of film, producing both positive and negative images in an instant. Interchangeable disfont come in a wide selection of type sizes and styles.

The operational simplicity of the system's design enables the entire lettering operation to be conducted in normal room light and eliminates the fuss with chemicals and time-consuming process-

ing, expensive darkroom facilities as well as the need for special skills of trained technicians.

According to Donald E. Rushin, project manager, the initial models of the Promat system will be produced in St. Paul and marketed through the industrial graphics and printing products divisions to the graphic arts fields.

Correction

Thomas Perzichilli Jr. has been named a shift foreman, building service and cleaning products coater No. 1.

The wrong picture was published with his announcement in the May issue of the *Megaphone*.



Perzichilli

Carlton Society Recognizes 4 For Technical Contributions

(continued from page one)

neering in chemical ceramics led to the formation of a new business ventures division program. Also in the area of ceramics, Sowman's research has yielded transparent ceramic bubbles which are the basis of several divisional product programs.

Vievering joined 3M in 1916 as the first employee to devote a full-time effort to laboratory work. Vievering established the first quality control department within the Company, developed tests for uniformity and quality, and wrote the original factory standards. W. L. McKnight, retired board chairman and now director emeritus, describes Vievering as the "father of quality control at 3M."

At the presentation of the Carlton awards, R. H. Herzog, president and chief operating officer, praised the technical community for combining a sense of commerciality with creativity, for the cross-breeding going on between laboratories and for developing products for world markets, and not just those in the United States.

"I like what I am seeing in our technical endeavors today," he said. "It seems that our people are getting more creative."

The Carlton Society was founded in 1963 to recognize employees who make significant technical contributions to the Company's growth, and named for 3M's fifth president, the late Richard P. Carlton. This election brings the number of honorees to 47.

It is noteworthy that one of these most recent members, William A. Vievering, was instrumental in the hiring of Carlton.

Carlton Society Nominations Open

Nominations for 1975 initiates to the Carlton Society opened June 1 and will close July 31.

Candidates must have a minimum of five years active employment with the Company, unless retired or deceased.

Election is by vote of members of the Technical Council and research associates for outstanding contributions to 3M's scientific and technological activities; for consistently attaining the highest standards of originality, dedication and integrity in technical work; for the encouragement, by act or example, of younger technical workers; and for the enhancement of 3M's reputation as a leader in research and development.

Nomination forms outlining factors to be considered can be obtained from Technical Forum senators or by contacting Alice Barnholdt on ext. 3-2427.

After completing the form the nominator should obtain names of two additional people to second the nomination.

Completed forms should be forwarded to T. S. Reid, chairman of the Technical Council's Carlton Society Committee, Bldg. 201-1S.



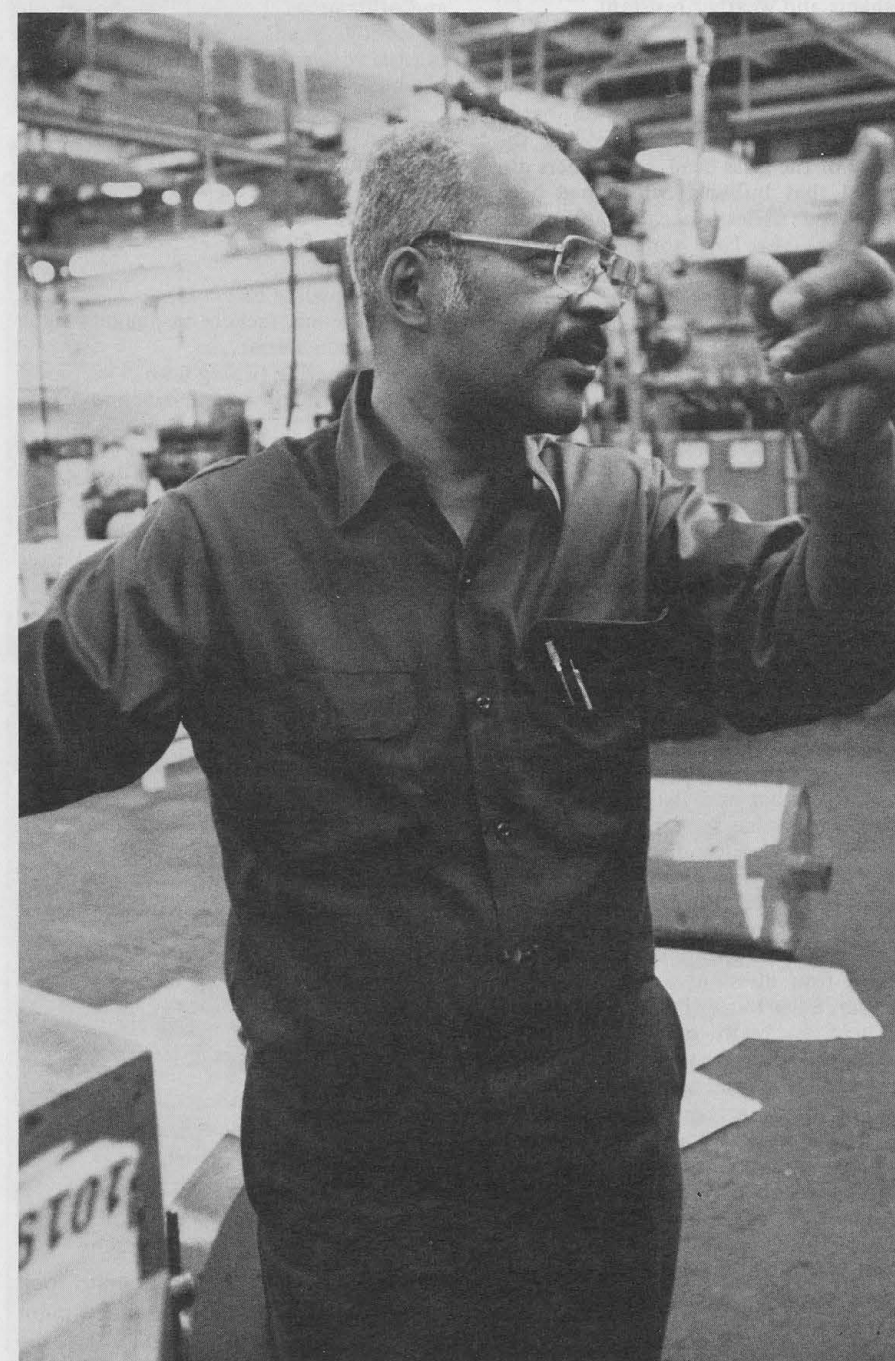
NEW CARLTON SOCIETY MEMBERS are Dr. Harold G. Sowman, left, Dr. Ernest J. Duwell, Patsy O. Sherman and William A. Vievering, far right. Standing second from right is Dr. Robert M. Adams, vice president of research and development.

ST. PAUL MEGAPHONE

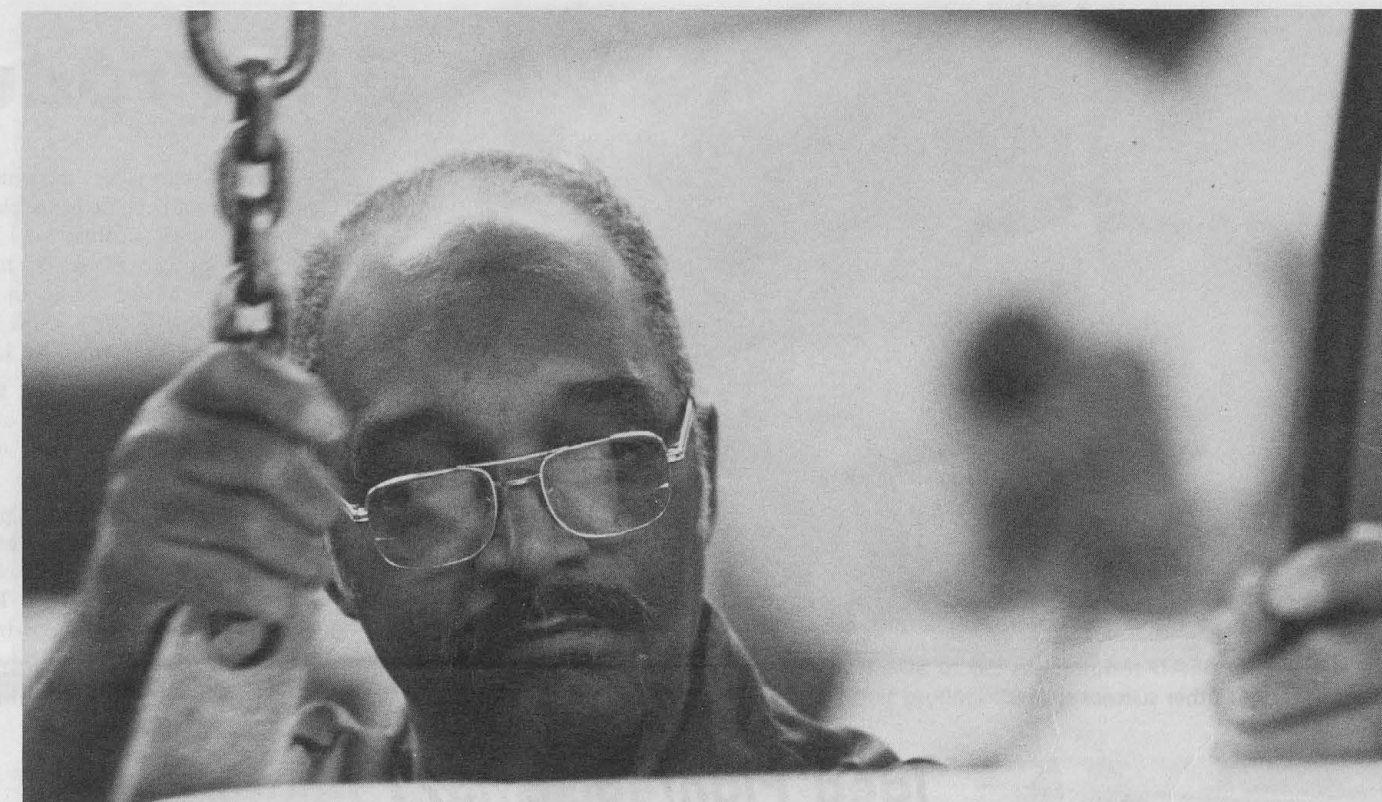


McADAMS smoothes down a new roll of tape to be fed into the coater.

Photos by Ed Fastner



STANDING at the front of his machine, McAdams makes a point.



HOIST is used to guide a massive tape roll to the coater.

McAdams Takes Pride In A Job Well Done

Quality of products is something we talk a lot about at 3M. It's one of the basic concepts behind efforts like "excelling in '74." Don McAdams is one of the many 3M people who help translate that concept into reality...

The whine of the huge machine is a familiar sound to Don McAdams, the husky, soft-spoken man who keeps it running. "I know this machine pretty well," he says as he runs his fingers over its well-worn exterior. "When something

isn't going right I should be able to spot it right away."

McAdams, 59, has operated this tape coater, or one like it, for the past 24 years. He takes pride in keeping it running, in doing his best.

"I try to do the best job I can," says McAdams. "I like my job, maybe because I'm used to it. And then I could say there's a whole lot of responsibility to it because you're responsible for the quality of a product."

The massive machine he operates coats thousands of yards of tape daily with an adhesive backing. It is one of three coaters in a high-ceilinged room that also houses two treating machines. They treat one side of material with a release coating, making the future tape easy to unwind, and the other side with a primer that insures the adhesive will anchor well to the film.

The room is filled with the rhythmic pounding of the machines — a noise McAdams says he got accustomed to long ago.

McAdams frequently steps over to the control panels at the front of his machine as the tape is being coated with adhesive that runs from a trough-like bin, checking the instruments and surveying the length of the machine, making sure all is running smoothly.

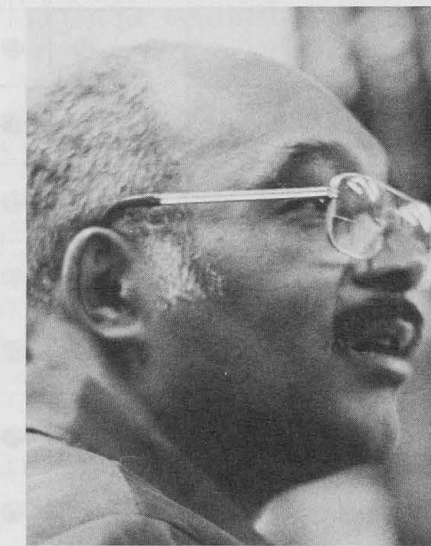
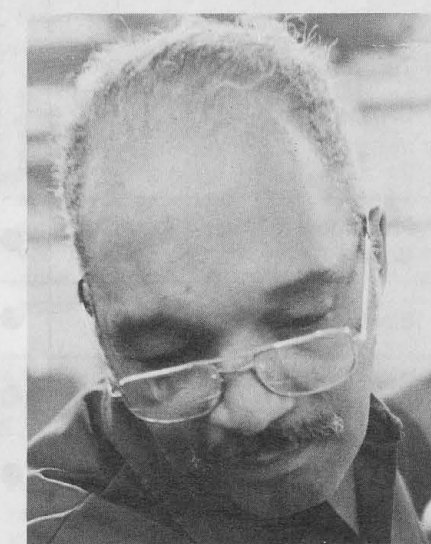
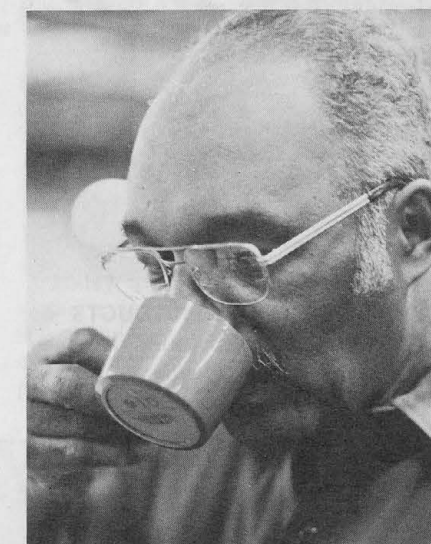
McAdams "was good right off the bat when I first hired him," says foreman Don Anderson. "He's interested in his work and enjoys it. You know he's always right there doing his job."

McAdams takes tape samples from every run and weighs them to make sure the proper amount of adhesive is being applied. "You can't get too much or too little on there," he says.

Several times a day he changes the rolls of tape that are run through the coater. A helper, Dan Archambault, assists McAdams. Together they operate the hoists which dangle from the ceiling and ease the lifting of the jumbo tape rolls, which can weigh up to 900 pounds.

Once the tape is coated his machine carries it through long, hot ovens to dry.

"The job is predictable to the extent that we know we're going to run some kind of tape on this machine. But sometimes we have problems with our machines that we have to handle," says McAdams, who keeps gloves and a supply of tools in his back pockets.

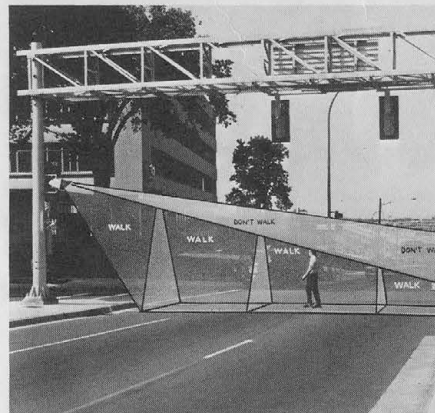


"One of the biggest challenges is when we have a product that's just being developed and we have to work with the process engineers on the best way to run it. Lots of times they ask us what's wrong with something and how we could do it better."

After the tape is coated and run through the ovens to dry it leaves McAdams' area. The jumbos are then slit into narrow bands and wound on individual cores to produce consumer or industrial size rolls of tape.



COATING AND BEAD technologies led to several printing products developments, among dozens of other success stories.



TRAFFIC CONTROL PRODUCTS are in existence today because of many technologies working together.

Idea Planted in '37

Bead Technology Comes Long Way

It's a long way from the center line of a highway to the core of a bowling ball. But this is exactly how far bead technology has come within the Company since 1937, when an engineer and his fellow laboratory workers concocted 3M's first reflective product.

This reflective highway center striping was made by covering one side of double-coated "Scotch" brand cloth tape with tiny, glass beads and leaving the other sticky side free for cementing

to the pavement.

Although this product was unsuccessful, it led to the development of "Scotchlite" reflective sheeting, used today on traffic signs all over the world. Through research and experimentation, 3M has been able to produce a very sophisticated reflective sheeting with superior ability to reflect light, even if that light is hitting at a shallow angle.

Even though "Scotchlite" sheeting has gone through several technical refinements since 1939, the manufacturing process has remained fairly basic.

First, a waterproof backing is covered with an opaque pigment which will reflect light. Secondly, a coat of microscopic glass beads, perfectly spherical with no imperfections like cracks or bubbles, is added. Pigment and beads are then covered with a thin coat of plastic to preserve the reflecting power of the beads and make the sheeting washable and weather resistant.

Bubble Discovery

The glass beads originally came from Czechoslovakia, but 3M soon began making its own. While improving the quality of the glass bead, researchers discovered that bubbles, which had been considered useless, accidental impurities, might also have some commercial value. Today, this off-shoot of bead technology is responsible for successful products in different divisions and departments: traffic control products, decorative products, medical products, nuclear products and adhesives, coatings and sealers, to mention a few.

The success of reflective sheeting spawned a goodly number of other products and product applications. One of the first of these new products was a tympan cover, used to equalize type pressure on the printing press. The 3M version of the tympan cover was made by coating glass beads on a special backing. The beads served to resist ink build-up which can interfere with clearness of the print.

Division Formation

This product and its success was directly responsible for the formation of the printing products division. When the new printing products division was separated from its parent reflective products division, it served as the start of the graphic systems group, which now consists of four divisions and 3M Business Products Sales Inc. (BPSI).

There are really only two types of glass beads: those that are hollow (bubbles) and those that are solid and rigid.

Rigid beads are a large part of the Company's nuclear energy research program. By filling these beads with controlled amounts of radioactive material, the material may be safely used. The rigid microspheres will not break. This is useful in measuring thicknesses . . . producing self-luminous materials . . . and now as a potential tracer for eventual detection and control of diseases.

Hollow glass beads that can be broken offer different applications. They

can be mixed with adhesives and coated onto the back of a material, like a decal. The beads act as "spaces" which temporarily block the adhesive from coming in contact with whatever it is to be stuck to. This allows the decal to be positioned properly. Then, by pressing on the material, the beads collapse, allowing the adhesive to take hold.

Filling Beads

Hollow beads can also be filled with an ink component within a paper web. This is the principle behind "Action" carbonless papers. The image is created when the pressure of a pen, stylus or typewriter key breaks the capsules, releasing the ink.

The fragrances of different items also can be placed in hollow beads and released by breaking them. This led to "Microfragrance" encapsulated scents, which are used in advertising, education and other areas.

Hollow beads are also used in the manufacture of timed release plant food.

- Today, you can also find beads —
- in the hulls of deep sea diving units
 - on off-shore oil well rigs for buoyancy
 - inside furniture as filler instead of wood
 - as bowling ball cores
 - in tennis rackets as a lightweight filler material
 - in floating fishing lines
 - as part of speedboat and barge hulls

More areas of development in bead technology are being investigated daily. Who knows what new products will come out of them? But one thing is certain . . . 3M won't stop trying to find out.



"PRECISE" timed release tomato food uses bead technology in a timed plant nutrition process. Nutrients within the capsules slowly seep out into the soil each time the plant is watered.

3M Products Tied By Technology

Fred Smith coats ceramic particles in an industrial mineral products division plant in Belle Mead, N.J. Bill Himburg sells masking tape to automotive suppliers in Detroit for the industrial tape division. Rita Johnson packs surgical face masks in the medical products plant in Brookings, S. D. Keiichi Miyazaki markets electrical products for Sumitomo 3M Ltd. in Tokyo.

Besides working for 3M, these employees . . . typical of 3Mers throughout the Company . . . work for different divisions and different locations. Their jobs appear to have little in common.

But they do. Each job is possible . . . along with those of nearly 80,000 other 3Mers around the world . . . because of the research and resulting expertise that have been developed by 3Mers. That research started with a knowledge of precision coating.

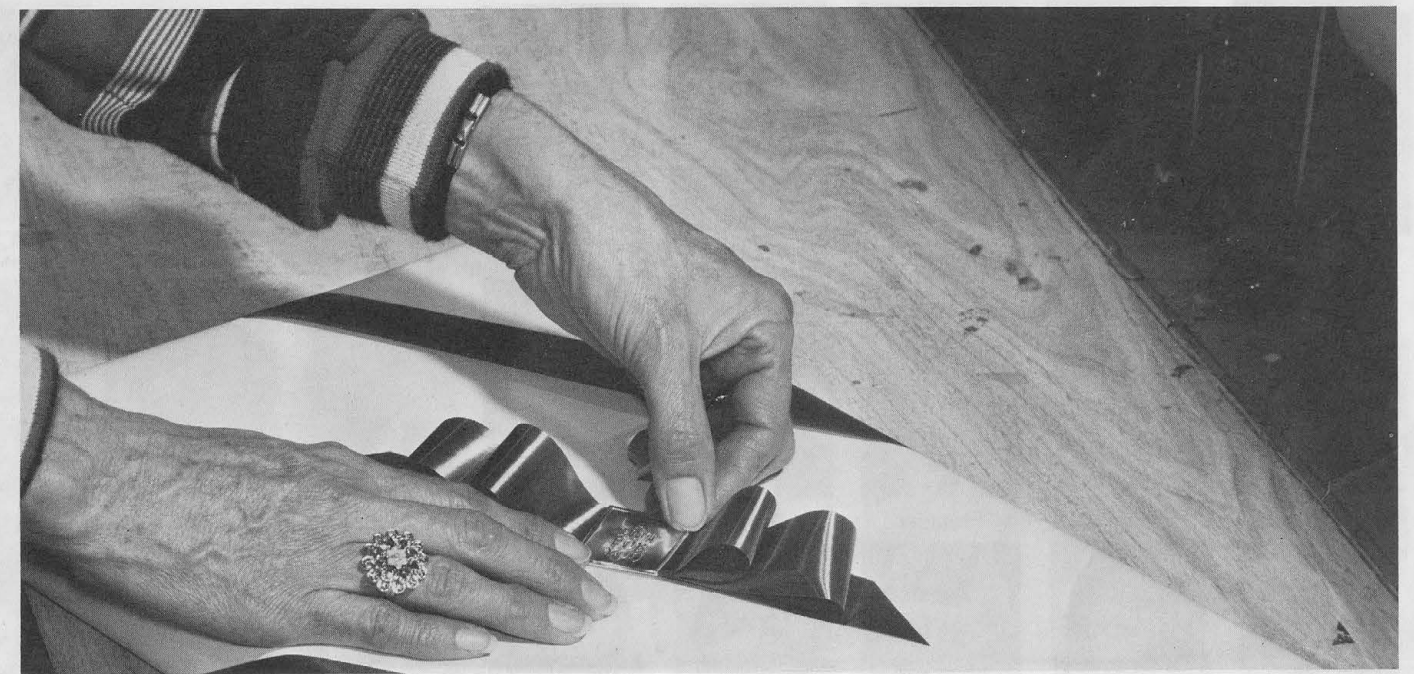
3M's business was originally the "sandpaper" business . . . coating and bonding abrasives to flexible backings.

Today, that research has moved forward into highly developed technical capabilities in 17 major fields.

Coating and bonding is the process of applying one material to another, such as adhesive to backing (pressure-sensitive tapes), abrasive granules to paper or cloth (coated abrasives), ceramic to granular minerals (roofing granules), heat or light sensitive materials to paper and film and metal (copying paper, photographic film and lithographic plates). Also iron oxide to plastic backing (magnetic recording tape), glass beads to plastic backing (reflective sheeting) and resin impregnated materials (electrical insulating materials).

Every major product group in 3M relies on precision coating technology for some of its products.

This section takes a brief look at how that first coating expertise "spun off" into major segments of 3M's business, and, through the use of two of many examples, to show how the current technical capabilities grew to provide thousands of jobs for 3Mers.



DECORATIVE RIBBON technology has led to many other product developments.

Development Continues

Nonwovens Leave No Loose Ends

The person who ties packages with "Sasheen" ribbons and bows, scours dishes with "Scotch-Brite" pads and patches a child's cut finger with "Micro-pore" tape doesn't see much relationship between the products. Perhaps the employees who make and sell those products don't either.

But they are related. They exist because two men in one of 3M's earliest laboratories saw the relationship in the technology it took to make them.

It began when 3M, then primarily in the abrasives and tape business, sought a better backing for its electrical insulating tapes. Synthetic fibers seemed the best solution, but none of the firms that 3M tried to hire to produce the synthetics could do so.

Learning Art

One of the lab workers on the project, Alvin Boese, was asked to learn the art of paper-making with hopes that 3M could develop its own synthetic fibers.

Boese didn't find a better tape backing, but he did develop an interest in nonwoven fibers which resulted in a process for combing and bonding the fibers.

While looking at a department store

window one day, Boese got the idea that the nonwoven fibers might be suitable for display materials. He dyed them and sprinkled them with colored flecks to brighten them up.

In 1944, he slit the material into strips and the 3M ribbon business was born. The product sold . . . but modestly. The material did not have enough strength to be cut narrower than two inches and did not have enough sheen to give it eye appeal.

Ribbon Idea

The lab had another idea for ribbons, however, and was experimenting with spinning nonwoven fabrics. As one of the lab workers, Howard Hoover, was leaving work one evening, he placed a sheet of paper under the spinning head of the machine to keep the material still in it from dropping into the curing oven below. The head was loose and swung lazily on a circular pattern . . . the fibers falling onto the paper.

Hoover returned to his bench the next day to find a new product for 3M's ribbon business . . . "Lacelon" ribbon . . . that looked like lace patterns.

Again, the product was not strong enough and didn't sell well. Worrying

that his project was doomed, Boese decided to try a long shot to make the ribbon stronger.

He bonded yarn to the ribbon to strengthen it and the business was on its way.

Supports Jobs

Today, the ribbon technology alone supports several hundred jobs at 3M. But the people working on the project did not stop once they had a successful product.

Going back to the business it already knew, 3M "married" nonwovens to abrasives (its first product), "Scotch-Brite" cleaning materials were the result.

But they were not the end. Dampening sleeves from nonwoven materials made offset printing much more economical and industrial face masks eliminated inhalation dangers in dusty or dirty work areas.

Then came medical products. The disposable, surgical face masks from nonwovens opened the door to other nonwoven products such as wound closures and surgical tapes. The story still is not finished, for 3M researchers continue to search for applications of nonwoven technology.

3M's Technical Capabilities

PRECISION COATING

This is one of the Company's earliest technologies, dating from the days when sandpaper was the only product. Today, pressure sensitive tapes, reflective sheeting, recording tape, copying papers, photographic, x-ray and microfilms rely on this capability.

ELECTRICAL

Controlling, reproducing and generating electrical impulses allows 3M to offer extensive electrical technology including transmitting, recording, conducting, insulating, and amplifying.

RUBBER & RESIN

The compounding of rubber and resins is the basis of the Company's adhesives, coatings, sealers and molded products.

FILMS

This technology, combined with additional 3M capabilities, produces such products as x-ray film, microfilm, overhead projection systems, film for windows to reflect or absorb the sun's rays, packaging films and bases for a wide variety of tapes.

FLUORO-CHEMISTRY

The best known example of this technology is "Scotchgard" water and

stain repellent, but the field covers much more including acids, liquids, plastics, elastomers, oils, waxes and greases. "Light Water" aqueous film forming foam is another important contribution in this area.

BEADS

Spherical particles may be ceramic, glass or even wax. They can be used to reflect light, such as in reflective sheeting; or to microencapsulate inks and fragrances which can be released by a slight pressure. They can be carriers for radioactive isotopes for medical research and measuring devices or in dental restorative materials. A new application of beads is in timed-release plant food.

NONWOVEN MATERIALS

Decorative ribbons, cleaning and finishing products for the industrial, institutional and grocery trades, filter and surgical masks and microporous tapes, and oil sorbents are examples of nonwoven technology.

INCREMENTAL OPTICS

3M's incremental optic capabilities are the heart of the 3M overhead and slide projector systems, as well as important parts of new traffic control and printing products systems.

PAPER MAKING

Capabilities in this area involve the manufacturing of copying, carbonless, microfilm print-out, and electrical insulation papers.

IMAGE REPRODUCTION

3M's imaging technologies have resulted in the marketing of copying machines, overhead projectors, microfilm systems, printing products, and videotape recorders. Related supply items for these systems include copying paper, microfilm, transparencies and print-out papers, carbonless papers, lithographic printing plates, photographic and x-ray film, and videotape.

ELECTRO MECHANICS

3M systems based on this capability include copying machines, microfilm systems, message repeaters and diverse hardware for many markets.

CERAMICS

Ceramic forming technology has produced products including electrical insulators, wear-resistant mechanical parts, and carriers for catalytic converters used in pollution control.

ENERGY CONVERSION

These capabilities have resulted in the production of thermo-electric gener-

ators which convert heat into electrical energy for use in the space program. Reversing the process, 3M produces systems which convert electrical energy into heat for such applications as high-performance food preparation and home heating products.

VAPOR COATING

Applying vaporized metallic particles to various substances allows 3M to produce recording and decorative tapes, and many other products.

MECHANICAL EQUIPMENT

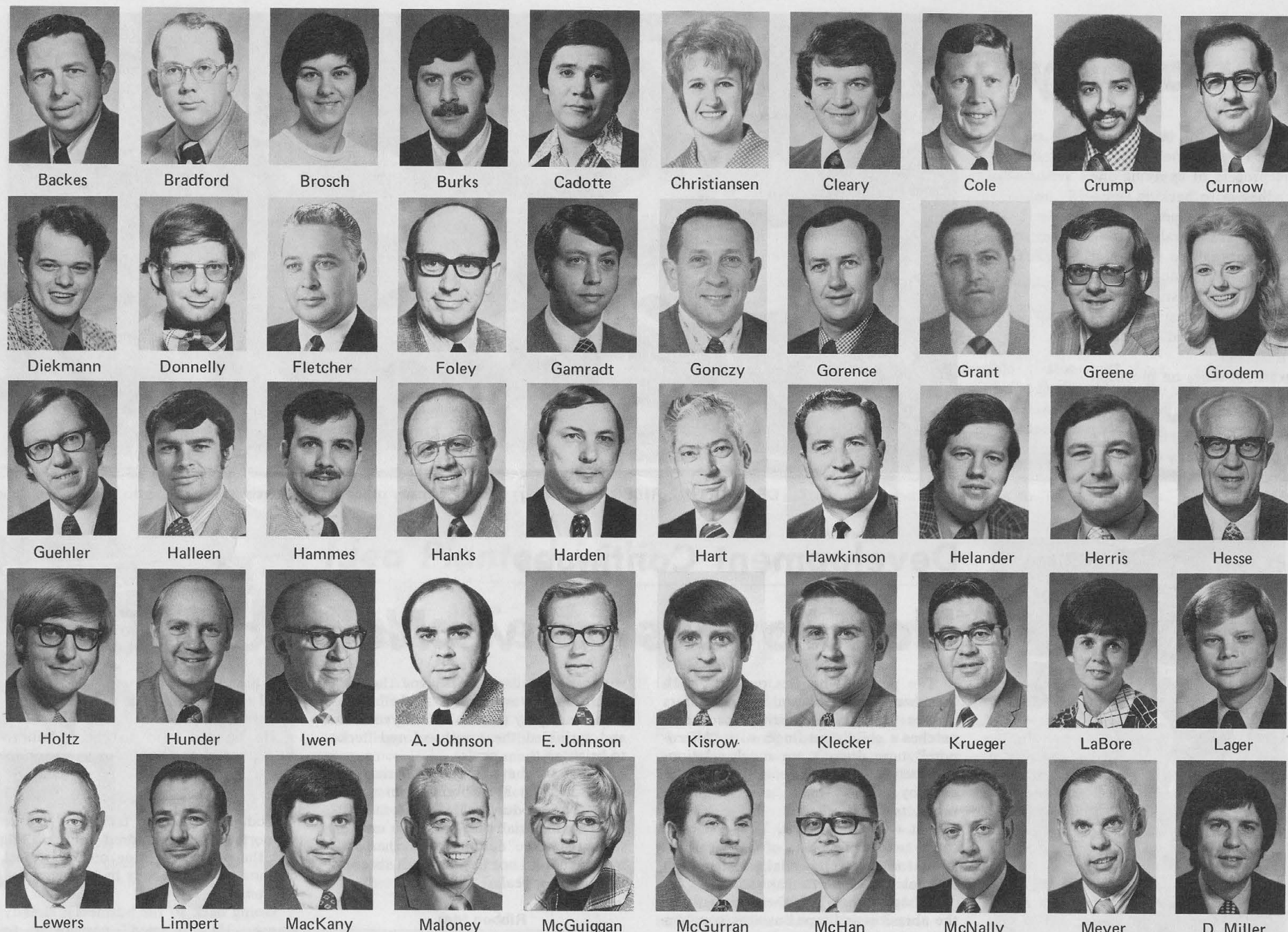
3M produces highly sophisticated control and measurement instruments for a variety of applications and automatic equipment for the packaging industry.

EDUCATIONAL

3M structures educational information to provide pre-recorded teaching tapes and courses and audio-visual materials for many phases of education and training.

SIGNING

3M supplies the services and materials necessary for corporate identification such as markings on cars, trucks and aircraft; product promotion or local advertising through all-weather outdoor signing.



New Assignments

Gerald P. Backes — project engineering manager, new film plant, film and allied products, division engineering.

John D. Bradford — marketing services supervisor, medical products, International.

Andrea I. Brosch — engineering assistant technologist, pilot plant quality control group, film and allied products division.

B. J. Burks — commodity specialist, machining, purchasing department.

Charles J. Cadotte — foreman, tape materials handling, tape plant.

Elva E. Christiansen — service awards program coordinator, civic affairs department.

David J. Cleary — market development supervisor, respiratory care and anesthesia markets, medical products division.

R. H. Cole — Eastern region sales manager, commercial tape division.

Kenneth K. Crump — marketing coordinator, automotive trades, automotive-hardware trades division.

James H. Curnow — project engineering manager, film and allied products, division engineering plant.

Roy A. Diekmann — senior programmer, IS&DP distribution systems department.

Charles A. Donnelly — lab project supervisor, facsimile products department.

C. P. Fletcher — market manager, utility markets, electro-products division.

James M. Foley — technical manager, power product group, electro-products division lab.

Stephen L. Gamradt — advanced product engineer, commercial tape division.

F. E. Gonczy — production services coordinator, industrial tape division.

Robert Gorence — international technical coordinator, traffic control products division.

R. C. Grant — division controller, technical ceramic products.

Mark L. Greene — IS&DP centers lead coordinator.

Marla R. Grodem — office supervisor, Minnesota Datronics.

Dr. Paul F. Guehler — laboratory manager, plant care systems project, new business ventures division.

Gary M. Halleen — lab project supervisor, facsimile products department.

Ron H. Hammes — inventory analyst supervisor — raw materials, inventory control department.

Jack B. Hanks — market operations manager, magnetic audio/video products division.

Duane C. Harden — technical manager, facsimile products department.

Carl L. Hart — manager, process and industrial engineering and quality control, packaging systems division.

David R. Hawkinson — administrator,

microfilm products division.

J. W. Helander — senior engineer, graphic systems product group, International engineering.

W. P. Herris — market coordinator, occupational health and safety products project.

H. A. Hesse — engineering standards manager, division engineering.

Allen R. Holtz — advanced development engineer, central research development lab.

Ray A. Hunder — product development and technical service manager, paper products lab.

Heinz Iwen — senior process engineer, microfilm products division.

A. E. Johnson — engineering supervisor, building service and cleaning products, International engineering.

Erlin J. Johnson — product development supervisor, designer and specialty products, decorative products division.

Lowell A. Kisrow — project engineering manager, industrial specialties, division engineering.

Gerald E. Klecker — superintendent, tape coating, treating and materials handling, tape plant.

W. C. Krueger — division controller, industrial electrical products.

Karen LaBore — salary analyst, compensation development, salaried personnel administration.

Walter J. Lager — market manager, education and library markets, commercial tape division.

James D. Lewers — manager, international market development, electro-products, construction and industrial markets.

Gerhard J. C. Limpert — senior engineering specialist, environmental engineering and pollution control department.

Michael J. MacKany — pricing strategies coordinator, duplicating products division.

Michael E. Maloney — data processing and order control supervisor, industrial abrasives division.

Ann McGuigan — advertising services coordinator, adhesives, coatings and sealers division.

Jon P. McGurran — senior research specialist, building service and cleaning products lab.

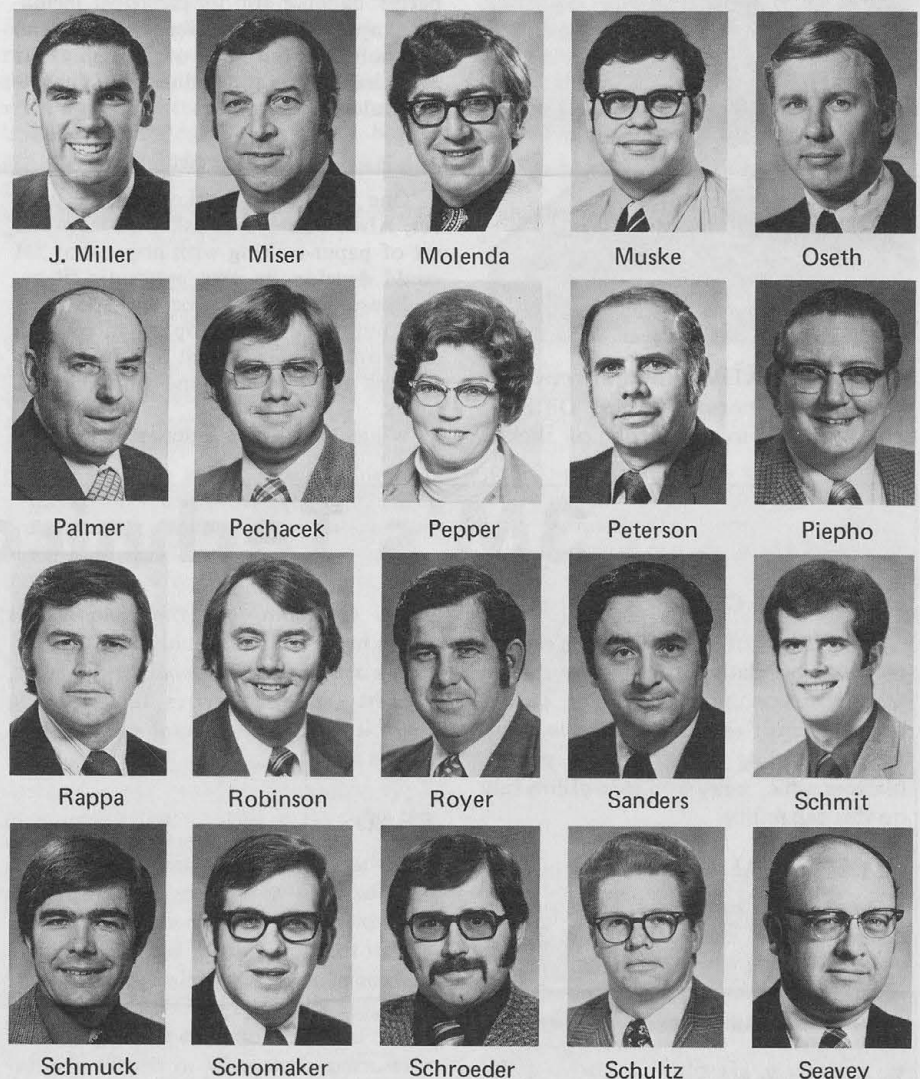
Sterling L. McHan — electronics data processing audit supervisor, internal auditing department.

John P. McNally — market manager, medical services, medical products division.

Harold J. Meyer — quality assurance manager, data recording products division.

Donald P. Miller — inventory accounting supervisor, raw and semi-finished materials, inventory control department.

James R. Miller — master technician, cable accessories group, telcomm department lab.



George W. Miser — market development manager, professional care market, medical products division.

Robert P. Molenda — project leader, innovative group, new products research laboratory, commercial tape division.

Jack L. Muske — advanced products control engineer, telcomm department.

D. L. Oseth — material control supervisor, hard goods manufacturing services.

Dave Palmer — foreman, second shift assembly operation, hard goods manufacturing services.

Gerald Pechacek — inventory accountant, raw and semi-finished machine part materials, inventory control department.

Helen Pepper — assembly supervisor, promotional services department, treasurer's division.

Robert V. Peterson — manager, product control, worldwide, visual products division.

D. A. Piepho — supervisor, woodgrain film production service, decorative products lab.

Bernard P. Rappa — technical service manager, visual products division.

Alan W. Robinson — facsimile sales manager, facsimile products department.

Leon D. Royer — product development and technical service manager, building service and cleaning products division.

Lawrence A. Sanders — staff controller, International.

E. Nick Schmit — market development manager, sterilization systems market, medical products division.

James A. Schmuck — market manager, magnetic tape devices, original equipment manufacturer and specialized data recording markets, data recording products division.

Thomas A. Schomaker — manager, distribution research and planning, Far East, International.

(cont. on p. 7)

July Anniversaries

3M Company salutes these employees who will observe their anniversaries of service during the month of July.

The number after each name below indicates the date next month that person will observe his 3M Service Anniversary. This is to enable friends to acknowledge the anniversary. 3Mers having their 15th, 25th, or 35th anniversary may have their portraits published.



45 YEARS
Francis O'Malley, cycle inventory systems (24)

35 YEARS
John R. Anderson, mail services (19)
George Drevnick, tape plant (29)
Charles Kachnovitz, tape plant (2)
John W. Pearson, division engineering (31)

30 YEARS
John R. Bellman, tape plant (20)
Erling K. Bruhjel, industrial tape lab (1)
Raymond E. Edge, tape plant (4)
Helen P. Landwehr, IS&DP (27)
Leonard G. Larson, tape plant (26)
Walter J. Rankin, surplus materials (29)
Lloyd V. Riley, inventory control (17)
Rose M. Romans, tape plant, (7)
Daniel W. Schroeder, maintenance (6)
Robert B. Snell, electro-products lab (3)
Wallace A. Weston, abrasives plant (8)

20 YEARS
Herbert G. Gish, purchasing (6)
Thomas J. Kowalski, property accounting (19)
Eva M. McKee, food services (6)
Gordon R. Smith, data recording products lab (15)

15 YEARS
Glendon Brandt, duplicating products lab (20)
Mildred Buhl, patent counsel (21)
Walter Cenicich, abrasives plant (1)
Chi Chang, graphic systems lab (20)
Bernard Gaffron, duplicating products lab (27)
Edward Griffin, purchasing (6)
Orlo Hursh, tape plant (17)
Robert Leaf, medical products lab (6)
Florence Lentsch, insurance (20)
Mary Napier, promotional services (30)
Harold Tasker, aviation (15)

Not Pictured

David L. Banghart — market development manager, industrial chemical products, International.

Robert Carter — foreman inspector, tape coating, tape plant.

W. J. Delaney — advanced process technologist, new business ventures division.

Margaret A. Donoghue — programmer, IS&DP centers administration department.

Tyler A. Downs — senior methods engineer, visual products division.

D. R. Greene — national sales manager, medical products division.

R. Grezek — junior foreman, tape coating department.

Tom Griffin — supervisor, duplicating units, reproduction services.

Glenn E. Hageman — converting planning supervisor, industrial abrasives division.

Fran Healy — materials control specialist, new business ventures division.

Joseph H. Hiller — project engineering manager, industrial specialties division.

G. L. Hoegnischmidt — quality inspector, tape coating and treating departments, tape plant.

P. J. Kuban — marketing coordinator, diversified industrial products section, industrial tape division.

D. K. Lifo — quality inspector, tape coating and treating departments, tape plant.

J. W. Matthews — process supervisor, duplicating products lab.

G. L. Pariseau — senior foreman, tape coating.

Robert E. Pettit — quality control engineer, industrial electrical products division.

G. H. Pfeffer — third shift quality inspector, tape converting department, tape plant.

N. D. Puffer — manager, tape and allied products group film liaison, packaging systems division.

Dr. Eldon S. Ratcliffe — supervisor, field development, agricultural products.

Shirley Skarda — junior cost accountant, cost accounting.

Ted E. Sokolowski — divisional trainer, education and training department.

O. Stadler — senior foreman, tape coating department, tape plant.

Neil Stafford — foreman, hard goods manufacturing department.

Ronald R. Waibel — advanced programmer, IS&DP administrative and personnel systems department.

J. A. Wilhelm — division controller, electronic products.

Personnel Announcements Continued...

William Schroeder — manager, plant engineering, International engineering.

Robert Schultz — master technician, product control lab, telcomm department.

Fred R. Seavey — supervisor, maintenance services.

H. Lynn Settle — supervisor, field services, traffic control materials department, traffic control products division.

William M. Shea — market analyst, analytical systems program, new business ventures division.

R. Clark Sherwin — quality assurance coordinator-specialist, product development and reliability laboratory, commercial tape division.

Stephen J. Sills — programmer, IS&DP manufacturing and accounting systems.

Donald G. Simonson — training supervisor, graphic systems technical training center.

Peter J. Skeffington — area planning supervisor, Asia and Far East, transportation department.

Gary Skinner — training supervisor, Midwest business products training center, St. Paul.

Nancy M. Spoo — buyer, purchasing department.

Kenneth W. Stewart — training supervisor, graphic systems technical training center.

Robert J. Thompson — process and industrial engineering and quality control supervisor, capital machine shop.

A. W. Tucker — international training



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In Medical Products

2 New Departments Formed

Two new departments — surgical services and new health care enterprises — have been formed in a reorganization within the medical products division. In a related announcement, John P. Low has been appointed to division marketing director.

Jerry E. Robertson, formerly technical director, was named manager of the surgical services department and Ronald O. Baukol was named manager of the health care enterprises department. Each department will have its own sales, marketing and laboratory functions.

"The formation of these departments is an exciting milestone in the division's growth and reflects 3M's philosophy of identifying and developing the growth of smaller units within the whole," explained William T. Wise, division vice president, in making the announcement. He noted that the creation of a department signifies that at least one clearly defined business exists within the de-

partment, is profitable and has the growth potential of achieving future division status.

Low, who joined 3M in 1942, was general sales manager for the division. He will now direct the sales and marketing functions of the medical services segment of the division's hospital business and head the division-wide functions of sales training, government and original equipment manufacturers sales, service operations, and sales and marketing administration.

The surgical services department will provide products and services to hospital departments having to do with surgical and emergency patients. Included in this department under Robertson's direction will be Hall International, a subsidiary manufacturing air-powered surgical instruments.

The new health care enterprises department encompasses the division's existing activities in home health care, animal care and diagnostic markets. It will also extend into new health care markets such as dermatology, nutrition, eye care, and hearing. The present diagnostics marketing and laboratory efforts



Baukol



Low

in the division's medical services area will be shifted to the new department.

The medical products division in January 1973 organized its sales forces into two areas, surgical services and medical services. The former will now



Robertson

be part of the surgical services department, while the medical services sales force will handle the sale of applicable products to the non-surgical areas of hospital and patient care. In addition to its own sales forces, the new health care enterprises department will utilize other sales forces in the division.

15 Retire

The following employees retired recently. The numbers in parentheses represent years of service with 3M.

- Mabel Berglund, tape plant (31)
- John Davis, tape plant (36)
- Harold DeHaven, machine shop (24)
- Robert Flynn, office janitor services (15)
- Gerald Graff, receiving (39)
- John Kustelski, tape plant (43)
- Cyril McDonald, machine shop (24)
- Herbert Molean, abrasives plant (39)
- Daniel Schroeder, maintenance (29)
- Eva Schuster, promotional services (13)
- Kenneth Speedling, abrasives plant (25)
- Mary Spiel, graphic systems spare parts (29)
- Raymond Theissen, abrasives plant (40)
- Ivan Walstrom, tape plant (31)
- Roy Williams, tape plant (25)

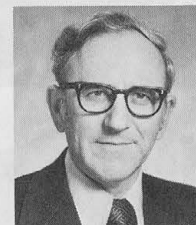
Freier, Nelson Named Directors In Central Research Labs

Two directors have been named in central research laboratories. Dr. Herbert E. Freier has been promoted to director, research services laboratory, and Leigh E. Nelson to director, pilot development laboratory.

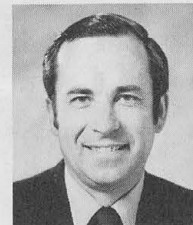
Freier will continue to direct laboratory work which provides analytical, physical testing and evaluation of materials which support all 3M laboratories. Most recently he was manager of research services. The research services laboratory recently developed the new product, Retrospective Identification, and assisted in the development of the Ion Scattering Spectrometer.

Nelson will continue to be responsible for production of pilot quantities

of new products, the development of processes for larger scale manufacture, as well as the development of new products in central research and other 3M divisions. Nelson has been manager of the central research pilot plant since 1972.



Freier



Nelson