The Advent of University-Level Packaging Scholarship: The Time, the Place and the People

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ABSTRACT

In 1952, Michigan State College (MSC), now Michigan State University (MSU), was the first university in the world to offer a Bachelor of Science degree in Packaging. Other universities had previously offered related courses like canning (as part of a food science degree) or military packaging (in wartime), but MSU was the first to propose packaging as its own academic field of scholarship.

Other universities followed, sharing faculty and curriculum models developed at MSU. As a result, graduates’ careers in packaging now have a higher professional status, and universities play a key role in developing our international community of packaging scholars.

Sixty-five years later, the purpose of this manuscript is to explore the unique circumstances that led to the creation of the Michigan State University School of Packaging. This historical manuscript documents the convergence of the time, place and people, and it shows MSU’s role in cultivating packaging scholarship around the world.

KEY WORDS: packaging education, packaging history, packaging research, Michigan State University

THE TIME: U.S. PACKAGING AND MARKETING IN THE 1950S

The time, 1952, is significant because a revolution to mass-production and mass-marketing had transformed American life over the previous fifty years. Shoppers in the 1950s had much different consumption patterns than their grandparents.

THE BIRTH OF MASS MARKETING AND CONSUMER PACKAGING: 1900

Fifty years earlier, in the late 1800s, most goods had been packed in bulk -- in barrels, wooden boxes and sacks -- and sold through a series of intermediaries to retailers. The shopkeeper apportioned products into consumer-sized packages like bottles,
canisters, wrappers and cartons. These reusable packaging forms were laboriously hand-crafted, as were the materials from which they were made: glass, steel and paperboard.

The year 1900 represented a “profound paradigm shift” to mass-production. A second industrial revolution began to mechanize harvesting and food processing. Handicraft was replaced by mass production and interchangeable parts. The safety of processed food and working conditions became a social issue to be regulated. The US became more unified by political stability, railroads and telegraph, enabling a new nation-wide mass market, “the democratization of consumption… a distinctively American contribution to the world.” Many US brands that benefited from early adoption – Nabisco, Quaker Oats, Campbell Soup, Heinz and Coca-Cola -- sustain the advantage today, over 100 years later.

Mass-production and marketing grew with the scholarship of Industrial Engineering, Management, Food Science and Business in the early 1900s. Before that, most engineers entered the field after serving an apprenticeship, but by the late 1800s, the “shop culture” gave way to “school culture.” The first US department of industrial and manufacturing engineering was established at the Pennsylvania State University in 1909, as Frederick Taylor pioneered the application of engineering principles to “scientific” factory management. Research and education in Food Science began with canning, after the bacteriology of sterilization was finally understood; by 1906 the first edition of the industry’s “scientific manual” was published, and the first university courses were offered at Massachusetts Institute of Technology and Oregon State University in 1913.

Marketing scholars emerged to analyze and improve this new “attitude towards business.” The first university-level Distribution course was offered in 1902 (at rival University of Michigan) and the first course with the word “Marketing” in the name was offered in 1905 by the University of Pennsylvania. Over the next 40 years, mass-marketing concepts, like distribution and advertising, were developed.

Mass-production of food packages was key to this revolution. During a short two-decade period, 1879 -1903, American inventors/entrepreneurs developed mechanized processes for making packages. Machines began to make paperboard and convert it to cartons, convert tinplate to cans, blow glass bottles, and automatically fill packages. The invention of the corrugated fiberboard box, mechanically made from three simple sheets of paperboard, delivered the goods.

The growing consumption of packaged products changed the way that people lived. Housewives learned to cook with packaged ingredients; bottled soft drinks and beer became commonplace; refrigerated and frozen foods (along with ubiquitous refrigerators and automobiles) increased the length of time between shopping trips and increased the amount purchased on each trip. And the growing promotion of packaged health and beauty products extended peoples’ lives and increased the number of times per week that they bathed:

Americans everywhere and of all classes began to eat, drink, clean with, wear, and sit on products made in factories. Toothpaste, cornflakes, chewing gum, safety razors, and cameras – things nobody had ever made at home or in small crafts shops – provided the material basis for new habits and the physical expression of a genuine break from earlier times. While the population almost doubled between 1880 and 1910, American industry produced seven times as much pig iron, nine times as much paper, fourteen times as much cottonseed oil, and nearly four times as many railroad freight cars to transport all the new goods.

By the time of the first supermarket in 1920, annual sales of packaged breakfast cereal, crackers,
biscuits, canned fruits and vegetables, preserves, soft drinks and other prepared foods soared sixty-fold over 1880 levels, eighty percent of which occurred after 1910, as shown in Figure 1.

THE BIRTH OF THE PACKAGING PROFESSION IN THE 1940S

A new packaging industry grew to serve the demand. At first, the people responsible for specifying packaging were salespeople and designers of containers. These suppliers were in industries whose trade associations identified with a single material (Glass Container Institute, Fibre Box Association, etc.). Suppliers worked with personnel at the “buying” company, whose education and backgrounds widely varied, from buyers to shipping clerks. There was no “profession” of packaging.

The first industry-wide trade journal and encyclopedia, Modern Packaging, premiered in 1927. From the beginning issue, the subjects were broad, and not biased towards a single material. They ranged from cost to value, from standardization to technology to color trends; broad subjects, intended for an audience of buyers sponsored by advertisements for packaging and machinery suppliers. In 1933 the Packaging Machinery Manufacturers Institute (PMMI) was organized to promote mechanized packaging processes. PMMI created an organization for its customers in 1939: Packaging Institute (PI) which quickly developed an independent agenda.

PI became the earliest educational defense against the growing power of packaging material and machinery suppliers. PI membership signified professional status for those who managed packaging for the largest consumer goods companies. PI organized technical committees associated with specific products and container types, conducted seminars and organized local chapters.

Although the academic fields of Business, Engineering, Management and Food Science were in ascendency in the 1940s, packaging was still relegated to being considered “part of the product.” After World War II, the demand for packaged goods skyrocketed, and commodity marketing theories gave way to marketing segmentation, often based only on package differentiation.

In 1947, W. B. Lincoln, Jr., at that time the Technical Manager at Inland Container Corporation, presented a plea to the industry, “The Importance of Specialized Study of Packaging Requirements,” stressing the need for technical education. He challenged educators and industry to recognize packaging as a part of the production process:
Technical training that leads to a comprehensive understanding of testing equipment and techniques, the physical and chemical properties of materials and the characteristics of finished products is definitely advantageous and can be obtained from the orthodox engineering courses. The specialized knowledge in our field of activity, however, has not been adequately codified or standardized. The solutions to our problems are not generally subject to calculation by formula. They are derived by experience and test under favorable conditions, whereas under unfavorable conditions all too prevalent it is a matter of guess work or copying competitors’ packages. We see, therefore, that in general the work is much more of an Art than a Science. It is easy to understand why this field had been largely ignored by educators and the more formal branches of engineering. This failure to appreciate the value of work in the field has unquestionably cost an enormous sum through the years. Producer, transportation agency and consumer have all shared in this unnecessary expense.

By 1950 the need for packaging education in the US was clear. The question was who would do it and what would it be? The surprising answer came from the Department of Forest Products at Michigan State College, a place that was becoming known for academic innovation.

THE PLACE AND THE PEOPLE: MICHIGAN STATE UNIVERSITY IN THE 1950’S

American colleges and universities have a long reputation of linking academic learning with professional practice. There was a “democratic” movement to utilitarian college learning, compared to the prevalent “classical education” in Europe and “prestigious universities.” During the 1800s, American colleges became the “semitic institution within the culture of professionalism,” preparing graduates for middle-class fields like teaching, administration and business. As the “normal” colleges were for teachers, the “land-grant” colleges were for farmers.

Founded in 1855 the “Agricultural College of the State of Michigan” was the model for the Morrill Act, passed in 1862 by President Abraham Lincoln, granting land in each state for agriculture colleges. The land-grant college concept was of a liberal education related to farming and “scientific agriculture.” Natural and social sciences were essential parts of this liberal education, as was the emphasis on practical, vocational education. “The validity of agricultural education was eventually extended to the mechanic arts, to home and family living, and to other aspects of human activity.”

By the late 1940s, then-named “Michigan State College of Agriculture and Applied Science” was in a period of rapid growth as it anticipated its centennial and aspired to become a world-class university. President John A. Hannah (Figure 2) led a major restructuring effort in 1944 to provide a “Basic College” curriculum for all students before they chose a field of specialization. He planned optimistically for the post-World War II education boom, and found ways to finance new buildings for academics, services and housing. Expansion became the hallmark of Hannah’s administration. By 1946, two thousand veterans, many married with children, were enrolled. MSC had become the country’s thirteenth-largest institution of higher learning by 1947, with 12,412 students, many of whom were housed in “temporary” Quonset hut and mobile home villages.

President Hannah encouraged the faculty to experiment with new specializations like Police Administration in 1937 and Hotel Administration in 1950. With Hannah’s emphasis on extending institutional services and meeting new needs, it was relatively easy to add new courses and programs: “The evolution of these new courses, new majors...”
and departments, and new or reorganized divisional schools was thrilling, providing unique opportunities for faculty and administrative creativity, recognition, and advancement.”

Concerned that the Korean conflict would decrease occupancy on campus, Hannah solicited recommendations on how to keep the new buildings filled and retire the bonds that were used to finance the dormitories.

The idea of a military packaging program was first suggested to a Forestry professor, Dr. Alexis J. Panshin, in May 1950, during a meeting of the Forest Products Research Society, by John Ladd, an alumnus with an MS in Wood Technology who was the Vice President of General Box Company. Such a program had operated at the US Forest Products laboratory in Madison, WI until 1945 but had been abandoned after World War II.

Dr. Panshin (Figure 3) was a creative faculty member who saw the opportunity. Dr. Panshin developed a reputation for taking risks as he also expanded the scholarship of forest products to “light building construction,” resulting in MSU’s successful School of Building Construction and Design. He was not afraid to fail, evidenced by his short-lived “mobile home” program from 1957-61.

The idea was supported by his boss, Dr. Paul Herbert, Director of the Division of Conservation in MSC’s College of Agriculture. Dr. Herbert was a veteran of both World Wars, and had served as a Captain in the Ordnance Department of the Army with responsibilities related to packaging during World War II. He was uniquely positioned to recognize the contribution that training and research in the construction of wooden boxes and crates could make to the Korean conflict. “As an officer in the Pentagon, he saw the waste of millions of dollars of ammunition and supplies due to faulty packaging.”

Dr. Herbert was the principal administrative supporter for the packaging program. His support continued even after he left MSU; in his later position as Director of Economic Development for the State of Michigan, he funded research projects at the School.

**PACKAGING TECHNOLOGY PROGRAM: 1952**

The new “Packaging Technology” program was assigned to Dr. Panshin and the Forest Products Department because he proposed it, and the focus was intended to be on wooden and wirebound
The initially-proposed packaging curriculum reflected his department’s emphasis; the first three courses were to have been “Wood and Fiber Containers,” “Container Packaging,” and “Container Handling and Loading.” 28 Ironically, although corrugated fiberboard boxes are also made from trees, they were not even part of the initial consideration, nor were other containers made from paperboard, glass, metal or the newly-introduced plastics. The legacy of the initial Forest Products focus is still reflected today by the program’s administrative home in MSU’s College of Agriculture and Natural Resources.

Early in 1952, graduate student James W. (“Jim”) Goff (Figure 4) accepted the position to lead the new wooden box program and begin as the first instructor the following Fall term. He was to develop laboratories, curriculum, and public relations like student recruiting and placement, as well as the initial research lines.

Goff had first heard of the proposal a year earlier when he was dually enrolled as an undergraduate student in Building Construction and as a graduate student in Wood Technology, during a wood shop class. The students had joked about a free-fall drop-test apparatus that had been donated by Acme Steel Company: “Now we gotta make boxes!” 29 He recalled a “tea” with the Dean of the Graduate School, who asked “I understand that you have a new curriculum over in Forest Products. It’s called Packaging and there are three courses: one on how to make a box, one on how to fill the box, and one on how to load it in a rail-road car. What do you know about it?” 30

The drop-tester was symbolic of Goff’s later pioneering research in distribution dynamics. He had just returned from World War II where he had served in the US Army Corps of Engineers in England and France. Son of a carpenter, he was a superb woodworker, but had no formal training focused on packaging.

So Panshin and Goff decided that it would be a good idea for Goff to get some experience. John Ladd offered him a summer internship at General Box Company in Chicago. Ladd proved to be a strong supporter of the program, serving as a member of the first advisory committee. He told Goff, “I don’t know how you’re going to do this. It’s a lot of stuff to do.” 32 That summer, Goff began a strong working relationship with the industry and the trade press (the largest publishers were based in Chicago). Meanwhile, back in East Lansing, Panshin appealed to the Dean (E. L. Anthony) to create an office for the program in the Forest Products Building (named B-4) near the Red Cedar River.

But Goff returned to his new campus office that fall with a vision that “packaging” in 1952 could be much more than wooden boxes.
MOBILIZING THE INDUSTRY: 1953

With the support of Panshin, Goff spent the next year courting the trade press and industry, and soliciting their feedback. He recognized the power of the trade journals, and found strong support as well as good recommendations from the editors. The good publicity was invaluable. Lloyd Stouffer, editor of Modern Packaging Magazine, praised the new program in news releases saying,

“It is a tremendous step forward in a direction that many thoughtful people in packaging have been urging for years…. There are in this country at present fewer than 2,000 persons who might be called packaging specialists. The opportunity is enormous.”

Stouffer was more than a friend in the media; he was a powerful connection to the administration at MSC. Early in his career at The Detroit Free Press, he developed a strong friendship with James Denison, Hannah’s personal assistant and public relations director. This friendship provided an important connection to campus administration, especially during the formative years, while Hannah was on sabbatical during 1953-4.

In the Fall of 1952, Goff accepted an invitation to join PI’s new Committee for Packaging Education by Larry Burton (Executive Director of PI). J. W. LaRocque, temporary Chairman of the Committee (a position that Goff would accept in May 1953), asked Goff to conduct a survey of PI’s members regarding the need for formal education in packaging and soliciting recommendations for packaging curriculum:

Could I impose on you for a simple, brief questionnaire which you feel can be directed to the members of the Institute, which would help us in determining those objectives which would be most beneficial to the undergraduate or to the educational institution considering packaging within its curriculum?

The outcome was PI’s “Advisory Service Report #323 – What 193 Persons Think About Packaging Education and its Employment Potential.” The preamble notes that 193 is “nearly double the number of responses to any other request presented to the membership…. It indicates a tremendous interest in the subject of Education in Packaging.”

The results, presented at the Education Committee’s first meeting on April 20, 1953, found that over ninety percent of respondents believed that “a college program for the education of packaging technologists would be of value to the industry.” Only fourteen percent thought that the program should be narrowly focused on package development, compared to seventy-five percent who “would rather see the program provide a more general training in packaging and include courses in marketing, advertising, and industrial management, in addition to some training in package design (art).” When asked “In any course of instruction on package development, which phase should be emphasized more heavily?” the responses were:

- Design for sales appeal (11)
- Design for functional efficiency (88)
- Both (75)

Most (140 respondents) felt that there would be “considerable demand” for packaging education, and starting salaries for graduates were predicted to be as high as $15,000.

This enthusiasm was the evidence that Goff and Panshin needed to revise the new program (especially since Goff’s first-year 10-month salary was only $4,500). The “comments” section of the document went on to recommend, collectively, a vast range of skills and educational foci, from science to cost accounting to truck loading. For example:

-There is great need for individuals who have
a pretty general knowledge of packaging from the standpoint of advertising value, functional value and production possibilities.

The training must cover not only the abilities of various materials, but also the limitations of those same materials under varied circumstances. A second thing that should be definitely stressed is a questioning attitude on the part of the trainee. The very fact that a thing has been done a certain way for a long period of time is sufficient reason to scrutinize for possible substitution of other methods.

Respondents’ wish lists ranged from applied, technical knowledge of materials testing and specifications -- to an understanding of “industrial management including packaging machinery and production methods” and the need for fundamental principles of science: “solid background in chemistry, physics & engineering fundamentals.” The need for education in art verses technology was controversial, but the argument was made:

In my opinion there will always be enough artists, but what every branch of the packaging industry needs is true students of packaging, men who can design packages to perform their many functions in the factory, with high speed, automatic machines, in the retail store and finally in the hands of the ultimate consumer, creating such a favorable impression that she goes back for more.37

(Not surprisingly for the time, one thing that the respondents did not seem to envision was the potential demand for women in the profession.)

Clearly the demand was for more than an education in wooden boxes. A vision began to emerge that combined science, technology, engineering and math with business, social science and art, as the focus broadened to include consumer and industrial packaging forms.

Goff worked with Burton and Stouffer to create a new curriculum, which was proposed to the first meeting of the program’s Industry Advisory Committee (IAC) in Spring 1953. The recommendations increased the core curriculum to seven courses, beginning in the Winter term of a student’s sophomore year, and ending with a Senior Seminar during the student’s last semester. Students were required to serve the industry in “at least 16 weeks of practical experience in some phase of packaging technology prior to graduation” They were first listed in MSC’s 1954-55 catalog: 38

FP (Forest Products) 201, Principles of Packaging
FP 320, Wood Technology
FP 324, Industrial Packaging I
FP 325, Packaging Materials
FP 422, Consumer Packaging
FP 424, Industrial Packaging II
FP 425, Packaging Cost Analysis
FP 462, Senior Seminar

The bias towards “industrial packaging” reflected the program’s home in Forest Products Department and Goff’s previous expertise.

Stouffer, Burton and R. Bruce Holmgren, editor of Packaging Parade, were charter members of the Packaging Technology program’s Industry Advisory Committee. Other members were purposefully chosen to represent potential employers from various sectors of the industry (Figure 5). Its purpose was (and still is) to contribute to curriculum development and keep the program attentive to the kind of skills industry requires of graduates.

That same Spring (1953), MSC hosted a military-industry packaging conference in the newly-built Kellogg Center that John Hannah intended for outreach and extension education. It brought many prominent packaging professionals to the campus and was a great boost to the public relations effort. Other demand-side public relations efforts included an exhibit at a National Packaging Exposition at Chicago’s Navy Pier and articles in the packaging trade press.

In Spring 1953, by the end of its first school
year, the Packaging Technology major at MSC had earned national attention. It was the only program of its kind, and potential employers were beginning to become interested. Goff recalls that Jack Breslin, MSC’s placement and alumni-relations director, would call every time that a company contacted him for a packaging intern or graduate, only to find that there were not any students -- yet.

RECRUITING STUDENTS: 1953-6

One respondent to the PI survey had anticipated this obstacle when he remarked:

The only reason I say “no” is that I don’t think you will find college students interested in taking a specialized course in this field, and particularly I don’t think they would be inclined to select packaging as a profession. If you could get the students, I feel there is a definite value to the industry.40

Embarrassed by the demand and faced with having to explain that there were not any students, Breslin, his assistant Jack Kinney and Goff met with a potential employer from Reynolds Metals to devise a cunning strategy for recruiting students through the local Lansing and East Lansing media. On May 1, 1953, an article appeared in the local Lansing State Journal entitled “New Four-Year Packaging Course is Open at MSC: Industry Encourages College in First Such Program in the Country.” The article detailed the opportunities available, named many of the companies that were known supporters of the program, and suggested

![Figure 5: First annual IAC meeting, May 1953. Seated (left to right): Dr. Charles O. Harris, Head of MSC Dept. of Applied Mechanics; Dr. James Apple, MSC Dept. of Mechanical Engineering; Henry Sommer, Supervisor of Packaging Methods for Oldsmobile Division of General Motors Corp; Don Black, Manager of Customer Service for Acme Steel Products (representing SIPHME); John Ladd, General Box Co; R. Bruce Holmgren, Executive Editor of Packaging Parade Magazine; T. W. O’Neill, Manager of Claims for George F. Alger Co; Clarence F. Manning, Vice President of Reynolds Metals Co. Standing (left to right): Dr. William Robertson, MSC Dept. of Food Technology; James W. Goff and Dr. Alexis J. Panshin, MSC Department of Forest Products; Paul A. Herbert, Director of MSC Division of Conservation; and G. B. Bonfield, Vice President of American Box Board Co.](image-url)
that annual starting salaries in the field would range from $4,000 to $15,000. An even more powerful lure was posted in the campus newspaper, The State News, as a large advertisement seeking packaging employees.

The first undergraduate to respond to the article was Dave Seagrave, and Goff convinced him to enroll. He became the first student in the program in May 1953. He had been a discouraged Mechanical Engineering major in his junior year who was contemplating dropping out. He became part of the publicity when, in later interviews, he said that the packaging program gave him a renewed interest in college. When asked why he was interested in the field, he replied,

I like the combination – engineering, business training and salesmanship electives...and there is a wide-open field for men who know how to make a container that will help market goods.41

Seagrave quickly became the program’s top recruiter. During their first meeting, when Seagrave asked to meet the other students, Goff apologetically replied that there were no others -- yet. Seagrave quipped that he had friends who would be interested, and he would bring them in. As a result, by the time of the military-industry conference which was held later that month, there were already five new students working as assistants for the conference and prepared to enroll in the Fall.

In 1954, the program moved into its first “own” building, a 1200 ft² building fondly referred to as the “Bee House,” previously used by the Entomology Department to raise bees. Goff recalled that even after the packaging program took possession of the building, there was still bee paraphernalia in the attic. Classes were conducted in a classroom that was on the building’s second floor and the first floor, previously used for bee breeding, became the packaging laboratory. The Bee House remained the program’s home for the next five years.

As word of the program spread on campus, the number of Packaging Technology students grew to nineteen in 1954, and to sixty-one in 1955. Seagraves and six others graduated in Fall 1955. Of the sixteen graduates during the 1955-6 school year, seven were placed with packaging material supply companies, seven with packaging “user” companies, and two fulfilled military service obligations.42

The word began to spread internationally too. When the first potential Packaging graduate student, Alfred Barker, from Cambridge (UK),
requested admission in 1954, the registrar was not sure whether to admit a graduate student. He contacted Goff, because Panshin was on sabbatical, who said “Why not?” Barker and Roland Lancaster graduated in 1957 with the first MS degrees in Packaging.

From the beginning, enthusiastic students did the on-campus recruiting. There was an activist missionary-type zeal that came to be characteristic of students in the new program. They formed their own student organization on campus. Seagrave and a transfer student from the rival University of Michigan, Marve Cherrin, had a strong desire to separate themselves from their home department’s “Forest Products Society,” but when Cherrin and Seagrave approached Panshin for permission, he refused, saying that there were already enough student organizations on campus. When the disappointed students told Goff what had happened, he recommended that they meet directly with the Dean of Students, who told them that they did not need Panshin’s approval. And so the students went ahead and organized “The Packaging Society” themselves.

The Packaging Society received its charter in January 1956 at a meeting that Goff cited as “a very important event in the history of packaging educators at MSU and elsewhere.” Initially, President Hannah seemed to be reluctant to accept Cherrin’s invitation to attend the meeting, since he insisted that he did not want to speak. Goff remembered it fondly. After Harry Bull (from Michigan-based Dow Chemical) gave an energizing speech, Hannah was inspired to jump up and give his own, even longer, even more enthusiastic speech about the importance of packaging education (Figure 7). A second student organization, Pi Kappa Gamma, an honors society, was formed in 1958.

The military supplied students too. As a result of the 1953 Military/Industry conference, an Air Force officer, Landon Robinson, added the program to the list of schools that participated in the Air Force Institute of Technology, a program that sent aspiring officers to earn BS degrees. About a dozen cadets completed their degrees at the MSU School of Packaging. One, Paul Peoples (BS 1959, retired Colonel who later came back to work in University Development), laughed that his first impression of the Bee House work was far from packaging missile guidance components, “everybody was breaking Gerber baby bottles.”

The University of Wisconsin-Stout also supplied students. Planning to develop a similar program in 1960, they negotiated with MSU to offer concentrated versions of four laboratory courses during the summer, until space and equipment could be provided in Menominee. These short courses continued to be offered on an “outreach” basis to industry professionals until the late 1970s.

The students brought life and energy to the program, as contrasted to Panshin’s proposed mobile home program that failed for lack of interest. These early students were also the catalyst for organizing the Packaging Alumni Association in 1968. They spread the reputation of MSU as they began jobs in the packaging industry. And their college degrees increased the professionalism of a packaging career.

NEW NAMES: MSU, SCHOOL OF PACKAGING AND THE PACKAGING EDUCATION FOUNDATION

The period following MSC’s big Centennial celebration brought four significant name changes to this story. In 1955 Michigan State College became a “real” university: Michigan State University of Agriculture and Applied Science. (It would drop the “Agriculture and Applied Science” designation in 1964). The “Hannah years” became some of the most significant in MSU history as he led a state agricultural school to become a world-class
university, as MSU went on to join the Big Ten Conference, win NCAA football championships, and build a faculty with an international research reputation.46

The other three name changes occurred in 1957 when the Packaging Technology program became The School of Packaging, the Packaging Education Foundation was created from the Industry Advisory Committee, and “Dr.” Goff was awarded a PhD degree (in Forest Products).47

Like his students, Goff had a desire for the Packaging Technology program to separate from the Forest Products Department. While it appears to have been a separate entity in the 1954-55 catalog, Goff was quick to explain that it was not truly separate at that time. The Office of the Registrar had contacted him early in 1954 to ask how to list the packaging curriculum in the upcoming catalog (again, since Dr. Panshin was on sabbatical). Acting Program Director Goff decided that it made sense to list the program as a separate entity, rather than a mere division of the Forest Products Department. Goff remembered it well, “because I caught hell for it when he (Panshin) returned.” 48

By June 1956, the Bee House was stretched to the limit. A second professor was recruited from the Forest Products Department, Dr. Harold J. “Pete” Raphael (MSU alumnus, PhD in 1954, Figure 8), who went on to develop packaging education programs at Rochester Institute of Technology and (in his retirement) Clemson University.

There were 103 students enrolled, and Goff had embarked on an intensive campaign to equip the testing laboratory. That year the program purchased $44,405 of equipment, over half of which was from donations by twenty-four supplier companies including: Continental Can Co., Robert Gair Co., Reynolds Metals Co, Owens Illinois, Inland Foundation and Hinde and Dauch Foundation. Forty-five pieces of equipment were listed, ranging from a sample table and heat-sealers to a torque tester and weatherometer. There was a shortage of conditioned space for testing, and the existing space was being used almost continuously. Additional space and equipment would be required for a proposed course in packaging machinery.49

In 1956, a strategic plan with an 8640 ft2 facility was presented to the Industry Advisory Committee, based on a prediction that enrollment could “conceivably reach 500 students.” It was justified thus:

If the intrinsic possibilities of this area of activity are adequately recognized, Michigan State University can become a fountain of packaging information serving the entire world. The scope of packaging is every bit as broad as that of agriculture or home economics, and the institution can again become an outstanding pioneer in an important field if it so desires.

The number of trained packaging engineers which industry can profitably absorb defies the imagination. It is estimated that only 10% of all
American industrial concerns are aware of the great savings possible through intelligent packaging. Several of our industrial giants are only beginning to be concerned about their packaging costs and many more are only beginning to realize the marketing potentials contained in the packaging method.50

Financial support from industry provided the incentive for separation from the Forest Products Department. On August 3, 1956, representatives of the Glass Container Manufacturers Institute (GCMI) proposed moving their small research facility to MSU to get the advantage of “an atmosphere devoted to packaging research.” In a fortunate coincidence, they happened to be meeting with Dr. Panshin on the same day that the Industry Advisory Committee was meeting to discuss how it could better support the program. At a joint lunch, both groups came to the same conclusion: the program needed more funding and its own physical structure. As the University’s representative reported to President Hannah:

It certainly is true that this is one of the largest industries not now being served extensively by one or more of our universities. My guess would be that if we handle this correctly, we might be able to get a building out of it, and in addition considerable on-going support for research, fellowships, etc.51

That October (1956) GCMI rented temporary quarters in Lansing, but off-campus. They promised a teacher, Dr. Turk, practical problems for students, employment of students and joint research projects.

At the same time, the program’s Industry Advisory Committee committed itself to raising funds for a new building by forming the MSU Packaging Education Foundation (PEF), under the leadership of Bruce Holmgren, who was a lawyer as well as editor of Packaging Parade, and Orlin Johnson (Vice President of Packaging for Bristol-Meyers Products.) They were so serious about the packaging program being its own entity that one of the conditions in the agreement to incorporate was that it be identified as “The School of Packaging.”

The University conceded the “School” designation grudgingly. The Dean of Agriculture, Dr. Cowden, confessed:

Honesty would force me to admit that I have a price. I do not object to this school if the price is high enough. I certainly would object if all we get out of the industry is a dribble of a few thousand dollars…. I feel like these fellows from the packaging industry have done a lot of big talking. Before coming to a final agreement, they should be forced to make some commitments on the part of their industry. After all Michigan State has made commitments. We have a program with 102 students. We are leading the field. What I am trying to say is that I would not object to calling this a School of Packaging if they assume responsibility for raising $2,000,000 for a building.52

PEF’s second condition, that the degree be called “Package Engineering”, was vetoed by the University administration, largely due to the accreditation issues raised by the Engineering College and the desire of Dean Cowden and Dr. Panshin to keep the program in the College of Agriculture.

This separated the School in name and in the 1958-9 University Catalog. However, the budget remained in the Department of Forest Products until 1966. Goff remembered that it was not too bad, “You could complain, but you didn’t have to worry about the budget.”53

Although MSU offered the first BS degree in Packaging, other universities were also experimenting with packaging courses. Fladager54 lists ten schools that offered courses in packaging during 1955-6:
Most of the courses were materials-oriented, offered with assistance from packaging suppliers. They focused more on the supply of packaging than on the demand. They focused more on technical issues of protection than on marketing functions and consumer packaging issues.

BUILDING THE SCHOOL OF PACKAGING: 1957-65

After lengthy negotiations with MSU, PEF was incorporated in 1957 in East Lansing:

To aid and promote by financial assistance and otherwise all types of packaging education and research at Michigan State University of Agriculture and Applied Science, including full authority to receive donations, bequests and devices; to purchase, lease or otherwise acquire and to sell, donate or otherwise dispose of all kinds of property, real, personal and mixed; to pay in full or to supplement the salary or salaries of any person or persons engaged in any phase of packaging education at said Michigan State University; and generally to do all acts and things deemed necessary or expedient for the development, expansion and extension of such education and research.55

The Board of Directors were Thomas A. Hamilton and Philip J. May, representing President Hannah’s office, plus Dr. Panshin, Bruce Holmgren and Orlin Johnson. May was the University’s Chief Financial Officer, instrumental in creating the conduit for funds. The University pledged to fund the first year, including paying the Foundation’s first director, Henry G. Walter, retired from US Steel (strapping division).

By 1960, the PEF Board of Trustees had grown to twenty-two and had raised about $250,000 towards their $2 million building fund goal. A brochure promised that “under this program of growth, Michigan State University will become a virtual fountainhead of packaging information.”56 By 1962 there were thirty-three representatives, and twenty-eight companies were listed as contributing $1,000 or more, representing a mix of suppliers and user companies.57

Meanwhile, in 1959 the School moved to a larger home (4,500 ft²), one of the larger, so-called “temporary” buildings (previously used as army buildings) that were common on campus during

Figure 9: Pi Kappa Gamma and Packaging Society members moving the Silver Stitcher into the temporary building in 1959 (standing: Richard Arnold, Ed Weiss and Pat Kirby; crouched in front: Hugh Lockhart and Ted Kraus).
the 1950s. The building remodeling and move were led by the students, men with wood-working skills, enthusiasm and a sense of self-sufficiency that characterized the School (Figure 9).

Drs. Goff and Raphael were joined by other “homegrown” graduate students who earned PhDs from the Forest Products program. The first were Dr. David L Olsson (BS 1957, MS 1960, PhD 1967) and Dr. Hugh E. Lockhart (BS 1957, MS 1960, PhD 1965). Dr. Lockhart would become one of the program’s most beloved professors until his retirement in 2007.

PEF also had a great influence on the School’s burgeoning research program in the 1960s. President Hannah added Maurice Day, a Trustee of the University and the Vice President of Crucible Steel, who had helped the University of Chicago to raise funds by doing contracted research, which he recommended as a potentially successful approach for the School of Packaging. The resulting “multi-sponsor research program” proposed areas of fundable research; “Control of damage during distribution” was to become the most productive, followed by permeability (water and gas) and package closures (including heat sealing).

The earliest, and largest, research sponsor was the GCMI. Other companies such as Proctor and Gamble and General Motors followed, recommending projects and meeting to discuss results. Each sponsor paid a $3,000 annual subscription, two-thirds of which is used for operational costs, with $1,000 being applied to the building fund. By 1964, the program had contributed $69,000 to the building fund. The multi-sponsor results were published by the School in a series of Technical Reports to which sponsors were given exclusive access for one year. There were no academic packaging journals, nor the internet, so these reports can now be found only in the MSU Library. At the same time, the School offered testing services, which also supported personnel.

By 1963 the Foundation had raised $400,000. Although this was far short of the $2 million envisioned, it was enough to break ground for the “first phase” of the ambitiously proposed 68,000 ft² four-story building. A decade after the first students enrolled, The School of Packaging was granted permission to begin to build its own facility. Goff remembered the date well: jubilation over the approval by the University on November 22, 1963 was dampened by the news that President John F. Kennedy had been assassinated. The Ground-breaking ceremony took place April 19, 1964 in a sheep pasture south of the Engineering Building on Wilson Road.

The modest, new one-story building was 20,871 ft², with offices and six laboratories, three of which were TAPPI-conditioned. The construction cost was $418,852. The University supplied regular classrooms elsewhere. This is still the home for the School, including a major 29,681 ft² addition in 1987 funded by a $3 million capital campaign (actual cost was $3,056,000).

GROWTH AND LEGACY OF THE MSU SCHOOL OF PACKAGING

Dr. Goff was responsible for the program’s day-to-day success from the beginning, with Dr.
Panshin running interference with the University Administration. Dr. Goff finally, officially, became Director in 1966, as Dr. Panshin prepared for retirement. Goff oversaw the new building and growth of the student body and faculty. He was actively involved in developing the multisponsor research program and the Packaging Education Foundation, and he (literally) built the program and facility.

Goff jump-started the School’s research program. His leadership in packaging dynamics research laid a scientific foundation for future scholars, and led the industry to fill critical gaps in understanding regarding the protection afforded by packages in distribution. He helped MTS and Lansmont to develop shock-and-vibration test machines and recording devices, adopting some technology from the Polaris Missile Program. His research team developed performance standards for packages used for commodities ranging from food aid to furniture, and he served as Chair of ASTM Committee D10 on Packaging from 1962 to 1970, and as Chair of ISO Committee I22 on Packaging in 1968.

Goff encouraged women to enter the field. His Administrative Assistant, Elizabeth Anderson (“Mrs. A.”) served as student advisor and placement coordinator, and actively recruited women to the program. The first, Eileen Emerick (Stevens) enrolled in Fall 1963, and by 1968 she was serving as an instructor and advisor, along with Regina Sherard, the first black staff member in the College of Agriculture.

Goff recruited a diverse faculty and staff who took advantage of the opportunity and were not afraid to fail. The early team of scholars were newly-minted PhDs from the Forest Products and Agriculture Engineering Departments with BS and/or MS in Packaging (Jim Goff, Hugh Lockhart, Pete Raphael, and Dave Olsson) and graduate students, like Howard Blake (MS 1960), Steve Pierce (MS 1968), John Hendee (MS 1967) and Istvan Gyeszli (aka Steven Gyeszly, MS 1971) who served as teaching and research assistants, and as instructors once they graduated. He recruited visiting scholars, like Gunilla Jonsön from Sweden, and Wilesse and Ed Comissiong from Trinidad.

Dr. Goff was succeeded in 1977 by Dr. Chester J. “Chet” Mackson (Figure 12), a Professor from MSU’s Department of Agricultural Engineering with strong connections in the College administration. When he promoted the program as offering...
“jobs galore,” and enrollment ballooned to 1,000, Mackson leveraged the number to boost the faculty to fifteen in 1984 including three retired colonels from the Air Force (Abbott, Peoples and Bankit) and a retired packaging author (Roger Griffin). He strengthened the School’s agriculture ties by hiring tenure-stream faculty with expertise in food science (Jack Giacin, Bruce Harte, Tee Downes, Ruben Hernandez) and Horticulture (Julian Lee), and he stimulated new areas of research by hiring newly-minted PhDs from other related MSU departments, like Chemical Engineering (Susan Selke), Mechanical Engineering (Gary Burgess), Agricultural Engineering (Paul Singh) and education (Rick Brandenburg).


Throughout the years, the faculty have been diverse in terms of their fields, even though many were “internal” to MSU, recruited from the departments as diverse as Forestry (Pascal Kamdem and Laurent Matuana), Adult Education (Robert LaMorceaux) and Supply Chain Management (Diana Twede). Hires from outside of MSU have been primarily from Food Science programs (for example Jack Giacin was recruited from Rutgers University, Tee Downes and Joe Hotchkiss from Cornell University, Eva Almenar from University of Valencia).

Loyal alumni also came back to serve. Some faculty members recruited from competing packaging programs had earned one of their degrees at MSU (Robb Clarke from San Jose State, Maria Rubino from Rochester Institute of Technology, and Claire Koelsch Sand). Other alumni without doctoral degrees, but with plenty of “real world experience,” became popular instructors (like Don Abbott, Paul Peoples, Paul Schmidt, Ron Iwaskwizecz, June Anderson, Paul Koning, Dennis Young) or have served as Outreach and Placement Coordinators (like Joe Irvin, Cimberly Weir and Peggy Nuerenberg). Beginning in 1981, overseas study courses were developed with the help of honorary graduate Frank Paine (UK), former MSU instructor Gunilla Jönson (Sweden) and alumni Nohoko Ishizaki (Japan) and Rafael Gavara (Spain).

Once the School developed its own PhD program in 1996, the program was able to recruit people with very specific research foci within the field of packaging (Laura Bix and Rafael Auras).

The curriculum has been through several revisions; a major theme from the beginning has been striking the appropriate balance between the engineering/technical focus and the business/
management aspects of packaging. One of the early proposals from PEF was to have two tracks, management and engineering, but since the Engineering and Agriculture Colleges could never come to agreement, it was not implemented. In 1962, two tracks were introduced: “management” which included more business courses and “technical” which included more engineering content. In 1987, the two tracks were merged, with the intention of increasing program rigor. And then, once again in 2015, a new Strategic Plan proposed three curriculum tracks:

1. Packaging Science (focused on material, food and biomedical products)
2. Packaging Value Chain Management (focused on business skills)
3. Package Engineering, to be administered jointly by the School of Packaging and the Engineering College

The first two were adopted in 2016, and the third is still pending negotiations between the Agriculture and Engineering Colleges; the jurisdictional problem persists.

Over the years, the School of Packaging building was enlarged (1987), more technology was incorporated in the student laboratories (like computer-aided design and prototyping) and an on-line MS program was introduced in 2001. By 2015, even the old “silver stitcher” and “guillotine” sample table had been sent to salvage.

The number of graduates has grown to over 10,000, about 150 BS, and 20 MS per year as shown in Figure 14. MSU’s reputation has grown with their success in industry and leadership positions in the Institute of Packaging Professionals. Several alumni and faculty have been inducted into the Packaging Hall of Fame. By 1988, the School of Packaging was included in a press-release list of the all-time “Ten Greatest Accomplishments at Michigan State University.”

**ENCOURAGEMENT AND STAFF FOR OTHER UNIVERSITIES**

The School of Packaging has always welcomed and encouraged collaboration with other universities’ Packaging programs. As a result, many of the other university programs employ a variation of MSU’s curriculum model, and are staffed with MSU alumni. The other universities share a common theme: an emphasis on applied technology.

MSU was generous in its support of other packaging programs. In 1966, PEF became the Packaging Education Forum, broadening its goals to support packaging education at several other colleges and universities, moving out of MSU into
the Packaging Machinery Manufacturers Institute. MSU welcomed the move, “We have been a little lonely in our role as the only university offering baccalaureate and Master’s degrees in packaging… If there were other degree programs at other universities, they would be mutually beneficial….Different approaches would serve the long-range best interests of both the industry and the universities.” Until its final distribution in 2004. PEF was a significant contributor to developing a packaging education network in the US.

On a more personal and collegial level, MSU began by providing special summer laboratory courses for the first students from the University of Wisconsin-Stout, in Menominee in the early 1960s. Goff was an advisor to the early program:

This was the first official inquiry by another university into the nature of the packaging program at MSU. It meant the possible end to our singular exposure to the academic critics…. The summer course approach devised to accommodate Stout students attracted other visiting students as well. Many came to take the courses as a continuation of their education in the field in which they were working. Some used the courses as a part of advanced degree programs in other institutions. Still others came in company-sponsored groups to take specific courses. In retrospect, the course offerings began to assist the establishment of a packaging program at Stout were a tremendous benefit in extending the influence of the MSU program.

In 1972, Dr. Raphael was recruited by Rochester Institute of Technology (RIT) to develop the highly reputed Packaging Science program there after he had left MSU in 1970 to briefly work for Avon. The RIT program launched in Fall 1973 with 19 students. Other MSU alumni joined him there: Dr. David L. Olsson in 1974, Daniel L. Goodwin in 1976, and Karen Proctor and Fritz Yambrach in 1983. The RIT program now has over 200 majors and another 100 students taking the packaging minor.

Dr. Raphael left RIT to “retire” to South Carolina, where he helped to start the packaging program at Clemson University, which has two adjunct faculty members from MSU (Tee Downes and Laura Bix) and one deceased (Jorge Marcondes MS 1988, PhD in Civil Engineering 1990, who also taught at San Jose State and University of Victoria).

Many of the other US universities with packaging programs have been staffed, in part, by alumni from MSU School of Packaging and/or a related MSU program:

- Rutgers: Kit Yam (MS 1980 and PhD in Chemical Engineering 1985)
- San Jose State University: Herb Schueneman (BS 1969), Robb Clarke (BS 1980), Fritz Yambrach (BS 1977)
- University of Wisconsin Stout: Joongmin Shin (MS 2004, PhD 2007)
- Indiana State University: Scott Morris (MS 1997 and PhD 2002 in Mechanical Engineering)

And the legacy continues as their programs’ alumni and new converts from other fields build packaging scholarship. These programs are housed in various colleges, each reflecting its own origin story and/or negotiated placement, and also reflecting the multi-disciplinary nature of the field. Packaging programs can fit in departments ranging from Food Science to Business to Technology to Agricultural and Biological Engineering.
INTERNATIONAL RESEARCH AND EDUCATION NETWORK

As the mission of Michigan State University became more international and research-focused, so did the mission of the School of Packaging. The university’s land-grant mission became more international under the leadership of Hannah and the following Presidents Clifton R. Wharton (1970-78), John A. DiBiagio (1985-92) and Peter McPherson (1993-2004). The university’s research reputation, first acknowledged by membership in the elite Association of American Universities (AAU) in 1964, was cemented when President Lou Anna K. Simon (2005-present) was elected as Chair of the AAU Board of Directors in 2015. MSU is now one of the top 100 research universities in the world, conducting “research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and make a positive difference.”

In the 1970s, an international packaging research community began to develop. Dr. Mackson led the School of Packaging to join other research institutes and universities, and served as Chair for the International Association of Packaging Research Institutes (IAPRI) 4th International Conference on Packaging in 1985, the largest IAPRI conference to that date.

Mackson was also an editor for the field’s first international peer-reviewed research journal, Packaging Technology and Science in 1988, in which they justified by the need for packaging science to escape being “buried in scientific journals related principally to disciplines on the margin of the subject.” Drs. T. Downes and Diana Twede have also served as editors of PTS. By the time that the School of Packaging celebrated its 50th anniversary by hosting IAPRI’s 13th International Conference, Worldpack 2002, the community of packaging scholars was a global presence.

Many of those international packaging scholars have spent time at MSU, either earning advanced degrees or as visiting scholars. Examples include professors from universities like Kasetsart, Mahidol and King Monghut in Thailand, Yonsei in Korea, Lund in Sweden, Hunan in China and the Chinese National Academy of Science, Victoria in Australia, and research institutes like CETEA in Brazil and ITENE in Spain.

Research conducted in the School of Packaging has extended to include more areas of inquiry, ranging from migration of monomers into food to the history of packaging. Research grantors have ranged from the federal government (USDA, NIH) to organizations and corporations for specific projects. To address more widespread research needs, the School formed, and later dissolved, cooperative research consortiums in the areas of distribution and food/pharmaceutical packaging (CDP and CFPPR) 1988 and sustainability (CPIS) in 2010.

Under the leadership of Dr. Susan Selke, the 2016 Strategic Plan (Figure 15) is expanding the School’s research productivity, generating international searches for scholars from fields like Polymer Chemistry (Mohammad Rabanawaz was the first), Food

Figure 15: Strategic Platforms for MSU Packaging Research
Packaging Toxicology, Packaging Dynamics, Biomedical Packaging, Human Factors and Bioengineering.

CONCLUSION

While packaging scholarship could have begun in a different time and at a different place, the year 1952 at MSU represented a special convergence of time, place and people. But we save the “go green, go white” cheerleading for MSU football games, because our pride is tempered by our respect and admiration for our colleagues around the world. Each institution has its own unique convergence of time, place and people. Each has overcome institutional obstacles and taken advantage of exciting opportunities. And together we advance packaging scholarship.

This paper ends with some short observations on what we have learned that might be useful to other packaging scholars.

LESSONS LEARNED: BALANCE INTERNAL AND EXTERNAL FORCES

External forces play a key role in developing curriculum and strategy. Any such applied program benefits from the reality check provided by an industry advisory committee, the trade press and employers. These can ensure relevance, bolster the search for financial support and help to communicate the business case to internal administrators.

Internal forces cannot be ignored. Program leaders need to understand the university’s structure, its silos, pitfalls and personalities. There may be no best academic “home” college for a packaging program since it involves disciplines ranging from Business to Engineering to Food Science, Technology and, yes, even Agriculture.

In hindsight, Dr. Hannah advised other programs to “begin by educating the officers and regents about your industry and its right to call for help in its training/education problems.”

If they seldom see or hear or read anything about your industry, its services, and its needs, they are not likely to be very sympathetic to pleas for help…We at Michigan State have often encountered raised eyebrows and snide remarks when it is mentioned that we offer degrees in packaging and in so doing, serve a major American industry.

As administrations change, we repeatedly learn the value of having leadership on our side.

LESSONS LEARNED: VALUE STUDENTS

Students are our customers and their success is our product. We strive to create a program that enables our students to apply fundamental concepts to optimize materials and package designs in ways that solve problems. Their youthful energy and initiative can accomplish great things.

But beyond that, we strive to catalyze enthusiasm; to create a program that inspires them to speak with passion about the problems that they are working on and the things that they are learning as they do. Learnings that they are excited to share with their friends and family (and through their social media).

Although the early MSU program had great success in recruiting transfer students, we are now successfully recruiting high-school students, as the packaging profession matures and the field’s reputation increases. Dr. Hotchkiss called it the “Relative Effect;” a high percentage of our incoming freshmen have parents, aunts, uncles, or parents’ friends working in the packaging field who recommended the program and the career opportunities. The large incoming freshman class has given the opportunity to extend and spread the curriculum over four full years.

Packaging students need practical experience, to begin to understand the field from the inside. A three to six-month well-paid internship gives a good sample, and students who are required to return to
an on-campus course can share with each other the similarities and differences that they observe in career paths, industries and how they solved various packaging problems.

LESSONS LEARNED: RECRUITING FACULTY

Dr. Goff emphasized that the faculty, not administrators, do the hard work. Panshin was wise enough to find the right person to trust and encourage, and he ensured that the dean and president supported the new program. Likewise, Goff empowered his graduate students and staff to go where no scholar had ever gone before. Tenure-stream faculty members are pioneers, who need the freedom and courage to build the future research landscape and curricula.

Successful practitioners (including alumni) can be excellent instructors, if the course learning outcomes are clear and measurable. It can be energizing for older professionals and retirees to work with young adults, and exciting for the students to learn how to solve “real world” problems.

Packaging is an interdisciplinary field integrating science, engineering, technology and management to protect and identify products for distribution, storage, sale and use. It encompasses the process of design, evaluation and production of packages. Packaging is a system integral to the value chain that impacts product quality, user satisfaction, distribution efficiencies and safety. As such, it provides an opportunity for researchers from varied backgrounds to fill very unique knowledge gaps.

Although there is a growing pool of packagers who have earned PhDs, there are clear benefits to cross-pollination. Professors recruited from other specialist fields can extend our scholarship of packaging, since the packaging field is so diverse. “Packaging is not a discipline (like English, History or Chemistry) but rather it is a profession (like medicine and law) which uses many disciplines.” MSU has been successful in converting faculty and doctoral candidates from other departments in our own university, as well as externally, including Engineering (Chemical, Mechanical and Agricultural), Food Science, Business and Humanities. These fields can provide a large pool of candidates, depending on a department’s strategy and alignment.

The packaging field, and a Packaging Department, benefit from faculty being involved in professional activities outside of the university, including professional and technical associations. Scholars give valuable perspective to the process of setting standards, responsible stewardship and conference organization. Serving as peer-reviewers, we advance packaging science.

Packaging scholarship will continue to adapt to remain relevant to the needs of academic community, industry and society. College degrees have increased the level of professionalism in a packaging career. University-level research will continue to lead to innovation and transformation while renewing the educational paradigms of packaging science. Together, we, the community of packaging scholars, will play a key role in economic development and improving the quality of life of the world’s citizens.

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[64] We will provide ref and call number when cataloged.

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[67] “Looking Back: MSU’s Top 10” 1987. Lansing State Journal, Dec 29. Two of the others were “Botanist William Beal developed in 1877 the first method to cross-fertilize corn to increase yields,” and “The first super conducting cyclotron was developed in 1982” Ed Zabrusky, Feb 18, 1988 letter to Hugh Lockhart notes that the list originated at the request of the National Association of State Universities and Land-Grant Colleges “to indicate the valuable contributions member institutions have made to bettering the lives of people throughout the world.”


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