A TECH has quite a winning streak going in the U. S. Steel — American Alumni Council national competition for the best performances by alumni organizations. In July, the Tech alumni were presented with their fourth consecutive first-place award of $1,000 for the “best sustained performance in alumni giving” among public institutions. It marked the first time that any institution has ever taken four first-place awards in the competition and you did it in consecutive years.

Tech's award was in recognition of the success of its alumni roll call campaign and other fund raising efforts during the 1962-63 year coupled with the fact that over 40% of Tech alumni had contributed to the roll calls for seven consecutive years. During the 1962-63 campaign, 49.8% of Tech alumni (a total of 14,110) gave $287,993 to the roll call.

* * *

This past year, Tech alumni again came through when 14,365 gave to the roll call. The total volume of alumni giving this year, excluding the Joint Tech-Georgia Development Fund share was well over $400,000.

At the same conference, this magazine received a special award for significant editorial achievement in the development of young photographers and an honorable mention certificate in the category of “Portraying the Institution.” The special award was given in recognition of the encouragement and experience the magazine has given five student photographers during the past five years. Four of the five are now in the photography field as a career and the fifth plans to enter it when he graduates next year.

* * *

Another thing that makes editing an interesting way to earn a living is the mail. We received a great deal of it recently after our column on politics. It seems that we somehow left out the name of Joe Tribble, the state chairman of the Republican party and a member of the Georgia Senate. And L. L. McAllister, Jr., another Republican, is the first Tech man to serve in the Mississippi Legislature. A number of Tech men are also active in the resurgence of the GOP in Georgia, but since this is an election year, we will leave it go at that, except to mention Joe Salome.

* * *

Tech men may be excellent engineers, scientists, architects, and managers, but they are lousy admissions officer material if the results of our July quiz are any indication. Of the over sixty filled-out questionnaires we received by August 1, not one man qualified for the free book, the highest grade was 40 per cent (and well over half the entrants scored a flat zero) which made director of admissions Bill Carmichael a very happy man.

B. W.
Greetings to students and alumni everywhere. We share your interest in the advancement of our alma mater, Georgia Tech.

Serving America's Great Names in Industry for over 42 Years

is a sure thing in each hot water generator built by FINNIGAN

Finnigan Hot Water Generators are engineered to give you large quantities of hot water for low operating cost. The finest materials, creative skill and quality construction assure efficient performance. "Fabricated by Finnigan" assures quality. Finnigan builds hot water generators to your specifications. Call, write or wire today for complete information with no obligation to you.

W. J. McAlpin, President, '27
W. J. McAlpin, Jr., Vice-President, '57
F. P. DeKoning, Secretary, '48
Your GEORGIA TECH CHAIR will Conform with any TREND

CONVENTIONAL

MODERN

Whether your home, office, or studio follows the so-called conventional or modern trend, this beautiful chair will lend itself in perfect harmony... for this chair, which comes in black, with gold trim, has a proper place in the conventional or modern setting.

You have always admired this type of chair for its beauty in design and comfort... and now you may own one with that added "Personal Touch"... The Georgia Tech seal has been attractively silk screened, in gold, to the front of the chair. The price is $33.00 — shipped to you from Gardner, Mass., by express, collect. Christmas orders by November 1, please.

Send your remittance to:

THE GEORGIA TECH NATIONAL ALUMNI ASSOCIATION
Atlanta 13, Georgia
THE COVER

The sounds and trappings of football are almost as important as the game itself. Each fall, the critics of the game get out their typewriters and go to work on it, but each year the sounds of bass horns herald a bigger season than the last one. In this picture by Bill Sumits, Jr. is the feel of the color. For the Techiteam's prospects turn to page 18.

CONTENTS

2. RAMBLIN' — the editor hails another Tech victory in a great string.

6. THE AUTOMATED BACKSEAT DRIVER — Tech research at work.


13. THE NATURE OF ENGINEERING — a famous educator has his say.

16. APPLAUSE FROM A GRACIOUS LADY — the Skiles dedication.

18. HAPPINESS — Bobby Dodd says it's "a stable of pony backs, etc."

22. THE GEORGIA TECH JOURNAL — all the news in gazette form.

THE GEORGIA TECH NATIONAL ALUMNI ASSOCIATION

OFFICERS AND TRUSTEES — Daniel A. McKeever, president • Alvin M. Ferst, vice president • Madison F. Cole, Newnan, vice president • W. Roane Beard, executive secretary • L. Lawrence Gellerstedt, treasurer • Herbert A. Bolton, Griffin • L. Massey Clarkson • James R. Dellinger, Jr., Cartersville • J. Leland Jackson, Macon • J. Erskine Love, Jr. • Dan I. MacIntyre, III • Frank Newton, Birmingham • C. T. Oxford, Albany • Dr. Kenneth G. Picha • John P. Pickett, Cedartown • James B. Ramage • Dr. John H. Ridley • Glen P. Robinson, Jr. • William P. Rocker • S. B. Rymer, Jr., Cleveland (Tenn.) • Talbert E. Smith, Jr. • William S. Terrell, Charlotte • John S. Thibadeau, Decatur (Ga.) • Ed L. Yeorgan, Rome • Thomas H. Hall, III, associate secretary

THE GEORGIA TECH FOUNDATION, INCORPORATED

OFFICERS AND TRUSTEES — John C. Staton, president • Oscar G. Davis, vice president • Henry W. Grady, treasurer • Joe A. Guthridge, executive secretary • Ivan Allen, Jr. • John P. Baum, Milledgeville • John O. Chiles • Fuller E. Callaway, Jr., LaGrange • Robert H. Ferst • Y. Frank Freeman, Hollywood • Jack F. Glenn • Ira H. Hardin • Julian T. Hightower, Thomasville • Wayne J. Holman, Jr., New Brunswick • Howard B. Johnson • George T. Marchmont, Dallas • George W. McCarty • Jack J. McDonough • Walter M. Mitchell • Frank H. Neely • William A. Parker • Hazard E. Reeves, New York • I. M. Sheffield • Hal L. Smith • Howard T. Tellepsen, Houston • Robert Thorpe • William C. Wardlaw, Jr. • Robert H. White • George W. Woodruff • Charles R. Yates

THE EDITORIAL STAFF

Robert B. Wallace, Jr., editor • Thomas H. Hall, III, advertising manager • Mary Jane Reynolds, editorial assistant • Mary P. Bowie, class news editor • Marian Van Londeringham, staff writer

Published eight times a year—February, March, May, July, September, October, November and December—by the Georgia Tech National Alumni Association, Georgia Institute of Technology; 225 North Avenue, Atlanta, Georgia. Subscription price (35c per copy) included in the membership dues. Second class postage paid at Atlanta, Georgia.
IN 10 OR 15 YEARS every driver may have someone backseat driving for him. And it will be a good thing.

The backseat driver will be wiser by far, even all-knowing. He will know if there is a slick spot on the highway ahead, if someone has stalled in the line of traffic or where there is a bad car tangle. He will keep an accident from multiplying as he warns approaching drivers of a collision that has just occurred.

The backseat driver’s warnings will come over radio equipment probably installed in the car’s regular radio. Transmitters along the highways will trigger the radio on with warning messages, automatically cutting off a radio station if necessary. The transmitters will be tied to a central transmitting system operating for a city or a region.

This is a plan for the future that Tech’s Dr. Donald O. Covault believes is almost entirely practical today. Last year he ran radio experiments using 4,000 motorists on a toll road in Kentucky, and he has just completed a study on Atlanta’s Northwest Freeway.

In both studies conducted for the U.S. Bureau of Public Roads, the civil engineering professor and his co-workers attached radio receivers on cars and radioed messages to the drivers over a test run.

The Kentucky drivers were chosen randomly for the experiment as they stopped to pay their tolls and were given very little information about the experiment.

The 150 captive motorists in Atlanta, however, were all volunteers known by Dr. Covault’s group. Many were Tech faculty and staff members. Others were members of the Atlanta Chamber of Commerce, the Atlanta Jaycees, the Georgia Motor Club, the Northside Kiwanis Club and employees of the Bureau of Public Roads.

The project was conducted with the Georgia highway department, and the motorists were thoroughly briefed be-
A Georgia Tech research project may pave the way for the day when traffic information will be fed to drivers via electronics rather than through signs.

Tech graduate students look over the shoulders of drivers from their over-pass perch crossing Atlanta's Northwest Expressway.

A volunteer driver helps add a "backseat" driver to his car. While in the range of Tech's transmitters he will receive his instructions.

Text by Marian Van Landingham
Photographs by Frank Kiernan
A volunteer female driver gets ready to leave on her test for the research project.

AUTOMATED MOTORISTS — continued

Before the tests started. When all experiments were completed, the participants were asked to answer a questionnaire evaluating their reactions.

The studies were run daily for two weeks between 9:30 a.m. and 3:30 p.m. so that peak traffic hours were avoided. The starting point for the experiment was near the freeway at Fowler and 10th Streets.

Drivers with receivers took messages as they sped down the test route. Time-lapse movie cameras mounted atop expressway overpasses and electronic equipment along the roadway measured their speed, lane placement, and the way they used lanes.

Some of the messages guided the captured motorists towards a rampway leading to Random Road, really Moore’s Mill Road. Their approach to the rampway was compared to run-of-the-freeway drivers approaching Moore’s Mill Road by traffic signs.

Unfortunately, in some of the experiments not all the motorists with radios found Random Road but the majority did. As Dr. Covault said, “We were trying to see how persons reacted when given radio communications compared with those following messages and signs. Most of them found Random Road much easier via the radio information.”

In secondary experiments Dr. Covault and Andrew C. Kanen, a master’s degree candidate at Tech, studied drivers’ reactions to roadside conditions. Once they told the motorists that there was a disabled vehicle on the road shoulder ahead. Most of the drivers changed lanes to avoid possible trouble and many changed their speed.

Another time the drivers were told that a workman was mowing the roadside up ahead and “you should take appropriate action.”

Dr. Covault says that the backseat driver also gave its captured motorists route information while they drove (for instance, how far it was to Marietta and to Chattanooga).

One of the major advantages of the transmitter system Dr. Covault has experimented with is that the motorist on a particular highway receives only information he can use, not information on traffic problems occurring on other roads as is the case with present helicopter reporting systems.

Dr. Covault believes that in the future traffic information can be broadcasted instantaneously by traffic control experts, with the conditions described precisely and objectively.

The roadside transmitters used in the experiments had a limited broadcasting range and conveyed messages only when the automobile was within a trigger zone, about 1,000 feet long. The receivers in the cars were silent at all other times. This short transmitting range meant that signals were received only by cars traveling in a specific direction. Thus, the drivers for whom the information was intended were the only ones to hear it.

“Road signs are probably still the best way to tell motorists about usual highway conditions but the radio would be particularly valuable in warning them about inclement weather — rain, snow, fog, etc., — and about accidents and complex interchanges,” Dr. Covault explained.

The Tech professor says that the present transmitters cost about $2,500 apiece and the receivers built by the Delco Radio Division of General Motors, $120.

“Delco has told us, however, that if the receivers could be put in existing circuits as the automobiles are being built the cost might be lowered to $30 with the advantages of mass production.”

Dr. Covault thinks that backseat driver receivers might someday be required equipment on automobiles just as windshield wipers, lights and now seatbelts are. He believes that a radio system would mean fewer accidents and speed up the flow of traffic, making our freeways not only safer but more usable.

Most of the motorists participating in Dr. Covault’s experiments have been very interested in the studies, but the professor is still wondering how one enthusiastic man managed to write down all the instructions he received while driving down the Northwest Freeway.
I. How The Tech Was Won

In which is related all of the trials and tribulations of the Honorable Nathanial E. Harris and his friends in the founding of the Georgia Tech

Coming hard on the heels of the bitter War Between the States, the period between 1870 and 1890 was the first and one of the strongest eras of economic regeneration in the postwar history of Georgia. In that 20-year span, manufacturing capital quadrupled, railroad track mileage trebled, and property values rose from $215,000,000 to $820,000,000. It was during this time of growth that a few far-sighted men began to think and talk about Georgia's needs for a technical school to provide the educated manpower and leadership for a continued industrial expansion.

By 1882 when this thinking phase gave way to an active campaign for the establishment of such a school, cotton was still firmly entrenched as king in Georgia. The state ranked tenth in the country in agriculture with over two-thirds of its entire area committed to farmland and over one-third of its population engaged in making a living from the soil. And cotton was the number one crop. Even the manufacturing boom of the period was dominated by cotton (over 60 percent of the total manufacturing was vested in cotton mills). And during one short span (1880-1883), the number of mills in the state jumped from 40 to 70, a growth partially credited to the impetus created by Atlanta's International Cotton Exposition in late (October 5-December 31) 1881. This exposition was visited by 286,000 people, pulled a profit of $20,000, and was considered by most historians as the event that made Georgia the leader in the manufacturing of cotton goods in the South.

In early May of 1882, a conversation between two Confederate veterans marked the beginning of the overt drive to open a technological school in Georgia. The two men were Nathanial Edwin Harris, then a prominent Macon attorney, and Major J. F. Hanson, a manufacturer at the time. According to remarks made by Harris at the Quarter-Centennial Founders Day celebration held in the Tech YMCA auditorium, June 10, 1913, "Hanson dropped by my home one afternoon in May, 1882, and suggested that we take a walk as he had something important to discuss with me. During that walk, Hanson told me, 'The State of Georgia needs a technological school, but I'm afraid she will never get it as it would take a million dollars to establish it.'

How N. E. Harris made his vow

"I was not familiar with the word at that time and asked Major Hanson to explain what was intended by such a
school. After he had done so, I remarked that I would rather be the author of a law establishing such a school than to be Governor of Georgia. The Major asked, "Well, why don't you become the author?"

As it worked out, Harris became both the author of the law and the governor of the state. He agreed to run for the 1882 legislature on the issue of the need for a technical school for Georgia and with the endorsement and editorial support of the influential *Macon Telegraph & Messenger*, which Hanson managed at the time, Harris was seated in the General Assembly at the November 24 session of that year.

**How Major Hanson used his press**

*The Telegraph and Messenger*, with Hanson's urging had already begun a strong editorial campaign for a technical school. On March 4, 1882, the paper had opened its campaign with a vigorous editorial by one of the South's best-known writers of the time, Harry Stillwell Edwards. His editorial read in part:

"The State has established an agricultural college with branches, and devoted much attention to scientific agriculture. Let the State do for the twin sister what she has done for agriculture. Establish, somewhere in the State, a Polytechnic College wherein shall be taught the Liberal Arts. (Author's note: This is one of the few times a writer ever referred to technical education as a liberal art.) free of all charge; where a boy or girl—rich or poor—may enter, and choosing from many, perfect himself or herself in the Art to which his or her life is devoted.

"Teach them the use of tools, the value and use of metals, the strength and use of woods, the intricacies and combinations of machinery, the power of steam and electricity, the rules of Agriculture and Drawing; teach them technical skill; teach them how to manufacture; and graduate each in the Department he has thoroughly mastered. Such a college has Massachusetts and New York. They are common in the old countries. When we have built up one in Georgia, we believe the problem will have been solved. Turn out into the State each year, a class of skilled mechanics, Architects, and Engineers, and there will be no want of skilled labor. Little manufacturers of every description will spring up right and left, the idle will be employed, there will arise a demand for everything the farmer can produce, a sale for every article the manufacturer can put forth, and prosperity,
such as we have never known, will rule in the land. With no idle labor, with a rapidly shifting purchasing power, with a good market and constant demand, any country under the sun is prosperous. Diversity of labor and protection of the manufacturing industries, we believe, is the secret of success. The latter we have; let the Legislature supply the means of reaching the other."

How Henry Grady joined the fight

Several of the state’s newspapers followed The Telegraph with editorials of their own. The immortal Henry Grady, of The Atlanta Constitution already a champion of manufacturing expansion in Georgia and the South, picked up the cudgel and fought vigorously for the concept that became Georgia Tech, through his editorials and speeches right up to the day of his death in December of 1889.

Lawyer Nat E. Harris formally became the Honorable N. E. Harris on November 24 when he took his seat as a legislator from Bibb County and embarked on a political career that would eventually take him to the governor’s chair by 1915. A rare politician who was true to his campaign pledges, the new legislator immediately drafted and introduced a resolution that would authorize the Speaker of the House to appoint a seven-man committee to thoroughly investigate the question of technological education. The resolution — referred to the committee on education — came back to the House floor slightly reworded on December 8, 1882, and was adopted without opposition. The committee — Harris of Bibb, Watts of Stewart, Calvin of Richmond, Russell of Clarke, Rice of Fulton, Wilson of Sumter, and Little of Muscogee — was appointed and charged in the words of the resolution “... to investigate and consider the propriety and expediency of establishing in this State a school of technology under the supervision and direction of the State University, and as a part thereof, to be endowed by the State and that said committee report their conclusions to this House at the adjourned session thereof ..." The committee was also asked to prepare a bill to create such a school if their findings on the need for the school were positive.

How a funeral became a meeting

The committee, now a 10-man one, held its first meeting in May, 1883, where the members had all gathered in Atlanta for the funeral of Governor Alexander H. Stephens. During that meeting they decided that the first order of business would be to inspect various technological institutions throughout the country in order to familiarize themselves with this relatively new educational concept. The next meeting was set for June 9 in New York City, the departure point for a tour of some of the leading Eastern technological schools. From there they went to Massachusetts Institute of Technology at Cambridge as the first stop on their fact-finding mission. The next visit was to Worcester Free Institute (now Worcester Polytechnic Institute) at Worcester, Massachusetts, a school that the commission report eventually called "the embodiment of the best conception of industrial education.”

How the politicians fought Tech

Other schools visited during the Eastern swing included Stevens Institute of Technology, Hoboken, New Jersey; and the Cooper Union in New York City. The committee members agreed to make a favorable report after they returned home and presented it as House Bill 732, authored by Harris and Little, to the summer session of the House on July 24, 1883. The bill was referred to the committee on finance where it received a second favorable report and was sent back for passage.

House Bill 732 hit the floor of the General Assembly on December 14, 1883, and immediately ran into bitter opposition. Many factors influenced those who led the battle against the new school. The newness of this concept of education (the first technical institute as such was founded at Chalons, France in 1802) was, of course, one reason. The fact that there was a strong resistance throughout the South to any type of education but classical was another. The opposition of some agricultural interests was a third. But the real stumbling block could be traced back to the unfortunate Reconstruction Period following the War Between the States when the old Confederate leaders were disfranchised, and the carpetbaggers and Negro leaders plunged the state into debt with their reckless spending programs. When the pre-war leaders regained control at the constitutional convention of 1877, a new constitution was molded that made it almost impossible for the state to go into debt for any purpose. This document, which its primary author Robert Toombs of Wilkes County described with the words, “We have locked the door of the treasury and have thrown the key away,” probably suited the times in which it was drafted, but for forty years it held the state in thrall and prevented any technological growth.

The committee members agreed to make a favorable report after they returned home and presented it as House Bill 732, authored by Harris and Little, to the summer session of the House on July 24, 1883. The bill was referred to the committee on finance where it received a second favorable report and was sent back for passage.

House Bill 732 hit the floor of the General Assembly on December 14, 1883, and immediately ran into bitter opposition. Many factors influenced those who led the battle against the new school. The newness of this concept of education (the first technical institute as such was founded at Chalons, France in 1802) was, of course, one reason. The fact that there was a strong resistance throughout the South to any type of education but classical was another. The opposition of some agricultural interests was a third. But the real stumbling block could be traced back to the unfortunate Reconstruction Period following the War Between the States when the old Confederate leaders were disfranchised, and the carpetbaggers and Negro leaders plunged the state into debt with their reckless spending programs. When the pre-war leaders regained control at the constitutional convention of 1877, a new constitution was molded that made it almost impossible for the state to go into debt for any purpose. This document, which its primary author Robert Toombs of Wilkes County described with the words, “We have locked the door of the treasury and have thrown the key away,” probably suited the times in which it was drafted, but for forty years it held the state in thrall and prevented any technological growth.

With all of this going against it, the first bill was beaten soundly.

Representative Harris, however, went right back to work on a new bill. The next year, he picked up strong support from Representative Joseph M. Terrell of Meriweather, a political power who later became governor and a United States senator, and Representative R. B. Russell of Clarke, later chief justice of the State Supreme Court. Together with Harris and the other proponents of the original bill, they convinced the State Agricultural Society, at that time Georgia’s strongest political force, to recommend passage of the new bill at the Society’s meeting of February 12, 1884. Another group of importance to the new school was the administration and faculty of the University of Georgia which would be the parent college of any technical school established in the state. Fortunately, Chancellor P. H. Mell, Dr. H. C. White, and many other prominent members of the University faculty came out publicly in favor of the new act.

How success finally came to Harris

Early in the 1885 summer session of the General Assembly, House Bill 8, a rewrite of the old House Bill 732 went to the floor of the House. After several days of heated debate, the bill passed the House with six more votes than the needed eighty-eight. Sixty-two members voted against the bill. Next, the bill was sent to the Senate, but before it passed the upper chamber, two amendments were added to it. Back it came again for House passage of the amended bill. This time, the enemies of the new school succeeded in defeating it by a vote of 65 to 53. A parliamentary battle developed again and after some behind-the-scenes work, Representative Harris finally won his battle through a reconsidered vote. The final tally was 69 for and 44 against. On October 13, 1885, Governor McDaniel signed the bill into law, and Georgia Tech was finally brought into a world divided as to its right to be there.

The new school again became the center of a battle when its chief opponent, Representative Harrell of Webster, returned to the House for the 1886 and 1887 sessions. But, by then, one of the original authors of the bill creating the technical school, Representative Harris Little of Muscogee (later Judge Little), was speaker of the House. Little used...
PROFILES OF THE PAST—cont.

all of his political power during these sessions to quell the many efforts of the opposition to repeal the law.

In January, 1886, Governor McDaniel named the first commission to organize and eventually run the technical school which at that time still had no name. The Honorable Nat E. Harris—the real founder of Tech—was rewarded for his years of struggle to establish the school by being named the first member of this commission. The second named was Samuel M. Inman of Fulton County, at that time known as “the first citizen of Atlanta and the prime mover back of the famed Atlanta International Cotton Exposition.” Next in line of appointment was Oliver S. Porter of Newton County, a man with a strong technical background and the developer of one of the state’s first successful cotton mills. The fourth member of the commission appointed was Judge Columbus Heard of Greene County, a lawyer, judge, state senator, and his county’s representative at the 1877 constitutional convention. A successful businessman and Georgia graduate, Edward R. Hodgson of Clarke County, was the final member named to the original commission.

At its first meeting, the Commission elected Harris chairman, a position he held until his death on September 21, 1929. Hodgson was named secretary and Inman was selected as treasurer. The commission then established that its first order of business would be to select a site for the new school. A letter was prepared and circularized throughout the state asking communities to compete for the new school with offers of land, buildings, and funds. On October 1, 1886, the deadline day for opening the bids, five were presented at the meeting held in the governor’s office. They came from Athens and the University of Georgia, the City of Atlanta, the City of Macon, the town of Penfield which offered the campus and buildings of old Mercer University, and the city of Milledgeville. After opening and studying the bids, the commission adjourned until October 2.

With the entire Commission membership and representatives of the five proposed sites present for the October 2 meeting, Chairman Harris introduced a new element that brought on a lengthy discussion. He stated that after the adjournment of the last meeting but prior to midnight on October 1, he had received a message by wire from Macon changing the bid of that city. He then asked the Commission if it would entertain Macon’s new bid. He continued by reminding the delegation from Atlanta that on the day before he had told them that Macon’s final bid was filed and under the resolution of the Commission it could not be supplemented. “Under the circumstances,” he said, “I will not ask the Board to entertain Macon’s second bid without Atlanta’s consent.”

After a short caucus on the subject, the Atlanta delegation said that it had no objection to the changing of Macon’s bid. Commission member Hodgson then offered the following resolution: “Resolved that the action of the Board closing all bids on October 1 be reconsidered, in order that Macon’s bid may come before the Commission.”

Commission member Porter, the lead­ ing advocate for the Milledgeville site opposed the resolution strongly on the grounds that “it would reopen the whole matter and be equivalent to putting up the school for auction.” Porter, who eventually became the first Commission member to switch his vote from a “favorite son” site to Atlanta, then listened as Hodgson offered his contention that the reason for his resolution was simply to allow Macon’s new bid. Porter offered a substitute motion that “Macon’s last bid be received and considered as the city’s only bid.” The minutes indicated that, “Porter’s substitute motion prevailed.”

How the final vote was taken

The Commission then decided to make inspections of all of the sites being offered for the new campus before making a final decision.

The site inspection took from October 7 through October 18 and the Commission began its voting on the final decision on October 19. The first ballot brought a vote for each of the sites. Harris went for Macon, a vote he stayed with for the complete 24 ballots necessary to arrive at the final decision, Heard voted for Penfield, Hodgson for Athens, Inman for Atlanta, and Porter for Milledgeville. On the twenty-first ballot, Porter switched to Atlanta, and on the final ballot the official minutes list Hodgson joining Inman and Porter in the Atlanta column to give the capital of the state the needed majority. A great deal of doubt concerning the accuracy of these minutes has been cast by several prominent residents of Athens in the past. Most of them insist that Judge Heard and not Hodgson shifted over to Atlanta on the final ballot, citing the fact that students at the University of Georgia actually burned Heard in effigy after the final vote was announced. A press clipping from the Athens paper of the time substantiates this claim although it’s difficult to believe that Hodgson would not have demanded a change in the official minutes if this indictment had been rightfully made.

Atlanta’s successful bid included $70,000 from the city and a citizens’ committee, a $2,500 yearly support guarantee, and four acres of land which was made available through a gift from Mr. Edward Peters. The original site offered by Atlanta was in the Grant Park area, but the Peters’ gift evidently dictated the change to the present site of the campus.

The total land area available for the campus came to approximately nine acres. Although it was located five blocks from Atlanta’s famed Peachtree Street, the campus of 1888 was just outside the city limits.

The original act creating the school had included the appropriation of approximately $65,000 to get the buildings started. This act carried the ever-present clause of that era, “provided, this sum shall only be available after the first day of January, 1887, and shall then be paid only out of funds in the treasury not otherwise appropriated.” With these funds and those made available by the City of Atlanta, the Commission let a contract on May 5, 1887, for the first campus structure — the Academic Building, now called the Administration Building—to Angus McGilvray on his bid of $43,250. Bruce and Morgan were the architects on this building as they were for the second one — the Shop and Foundry Building now called the Old Shop Building—which was let to Petit and DeHaven on a construction bid of $20,600. Both buildings were completed for the October, 1888, opening and Commissioners Porter and Inman spent the remaining funds for the machinery and equipment needed to open the school for her first classes. Total value of the building, grounds, and equipment when the school began operations was estimated at $140,000.

Between the knoll displaying the buildings and another knoll near Marietta Street and North Avenue, there was at the time a large gulley. In this area one of the fiercest battles of the War Between the States had been fought. One old-timer, recalling the battle for the newspapers of 1888, declared, “more men were killed here than in all the battles between Atlanta and Chattanooga.” When the buildings were completed a long bridge spanned the gulley to North Avenue so that the students could get into the city from their isolated fortress with its dry moat.

In the October issue the first president of Tech, Dr. Isaac S. Hopkins, arrives on the scene and begins to develop the school of one department.
THE NATURE OF ENGINEERING

Dr. Morrough P. O'Brien, dean-emeritus of engineering of the University of California, speaks his mind on a favorite subject

There always seems to be some confusion, at least in the press, over who are the engineers and who are the scientists. When a missile flight is successful, it is done by scientists, but when there is a malfunction and the range safety officer must destroy the missile, the engineers are involved.

This confusion between scientists and engineers is not merely a semantic one. It has very practical implications as regards education, educational plans, and even regarding the organization of the engineering profession.

Simplifying the difference between science and engineering: Scientists are concerned with exploring nature, discovering new facts and new relationships regarding physical phenomena. Engineers on the other hand are concerned, in their primary function, with the creation of working “hardware,” to meet a social need. By hardware I mean all kinds of tangible end products, such as this building, a bridge, an airplane, a missile. Engineers as such are not concerned so much with exploring nature for the purpose of understanding nature, as with exploiting nature by applying their knowledge to achieve tangible, useful results.

One of the best statements regarding the nature of engineering was written by Sadi Carnot in 1847:

“We should never expect to employ in practice all the motive power of the combustibles used. The efforts which one would make to attain this result would be even more harmful than useful if they led to the neglect of other important considerations. The economy of fuel is one of the conditions which should be fulfilled by steam engines. In many cases, it is only a secondary consideration. It must often yield the precedence to safety, to the solidity and durability of the engine, to the space it must occupy, the cost of its construction, and so forth. To be able to appreciate justly in each case the considerations of convenience and economy which present themselves, to be able to recognize the most important from those which are only subordinate, to adjust by the easiest method, such should be the power of the man who is called on to direct and coordinate the labors of his fellowmen and make them concur in obtaining useful purpose.”

Carnot graduated from the Ecole Polytechnique in Paris. He was one of the group of brilliant French engineer-scientists who did much to introduce the application of science into engineering. There have been many definitions of engineering, but to me Carnot’s is the most appropriate. It was written before there was an identified profession of engineering, and even before the word engineer was in use, but it concisely describes what engineers do.

It may seem trite to review the steps in the achievement of an engineering project, whether the project is within the state of the art, or one which tests the limits of novelty and physical possibility. All engineering projects follow a sequence of steps which I should like to review as the basis for later comments.

The first step, of course, is the identification of a worthwhile objective. Here, there is the interplay of what is possible, on one hand, which the engineers and scientists know about, and the requirements of society, or what is needed, on the other. Through the interplay of what is possible and what is needed, we define the objectives of engineering projects, whether a bridge, a missile, an Apollo project to land on the Moon, or any other. All go through this sequence, the first step of which is to identify an objective.

In defining the objective, there are many individuals
involved besides engineers. In the field of public works, there is a public need for roads, for sanitation, for irrigation, for bridges, for all sorts of works which find expression in the actions of public bodies. The engineers know what is possible and are qualified to estimate what it will cost. Once the objective has been identified, the next step is to develop a concept of some aggregation of parts which will, at least in principle, achieve this objective. There are some projects well within the state of the art—the pertinent questions are those of cost, of feasibility, of utility and so forth; novel concepts frequently raise questions of physical feasibility.

The third step, following evolution of concept, is analysis, a quantitative physical analysis of the concept in order to identify key problems and to set quantitative specifications for the components. I emphasize this point because, insofar as the efforts of engineering education are concerned, the principal emphasis is towards preparing the graduates for analysis rather than for the first two steps. Obviously in the first step (identification of what the social need is) there are many individuals other than engineers involved, but there is also an important part which engineers should play.

Continuing with the steps in an engineering project—if it is an advanced project such as Apollo, or any one of the new aircraft, such as the supersonic transport now under consideration, after preliminary analysis identifies the key problems, the next step is a program of study and experimentation, possible research, but usually exploratory development. Even when a major project lies within the state of the art, there is the need for examination of the effect of new materials and the appraisal of new methods of analysis which would refine the design or reduce the cost. Next, there is a re-analysis of the overall concept and a re-definition of the specifications of subsystems, components and parts. Here, of course, the engineer is concerned, as Carnot remarked— with safety, with cost, with reliability, with weight, and with many other characteristics as well as with performance. The next step is detailed design to incorporate the design concept of instructions for manufacture or construction. If the design is concerned with semi-mass production, there is usually a prototype for test. Even with large, one-of-a-kind structures, there frequently are models which are tested prior to construction. The next step is test and evaluation, then redesign if the tests indicate defects, following by manufacture of construction. Finally, there is field engineering involved in maintenance and operation.

If you look at this sequence, a number of facts stand out. In the first place, engineers are required in every step. Secondly, the scope of such projects is so great that a single engineer cannot cover all aspects. Projects differ in magnitude and character, from the very novel projects at the boundary of what is possible to the projects well within the state of the art, but nearly all require teams of specialists. The number of people required and the number of people available and qualified increases steadily from the first step on through to manufacture or construction. A few creative engineers, in many cases one engineer, can create and analyze the concept which required many engineers, technicians, and skilled workers to carry through. It is further true that very large projects, which are so characteristic of these times, require large teams of engineers and scientists, mathematicians, biologists, and others. Completion of a project requires a wide range of talents, experience, aptitude, and education.

There are opportunities in engineering for individuals with a wide range of ability and interest. Furthermore, note that, as a project proceeds from concept through analysis, preliminary designs, final designs and manufacture, the talents required change and the individuals involved in the project usually change. Engineers are required in every step.

**Major attention is on the analysis of concepts**

I have recounted this sequence to emphasize a number of points, some of which I have already mentioned. The principal feature to be emphasized for the attention of students and faculty is that, in recent years, the engineering schools have given a major emphasis to science and mathematical analysis and have in effect given their major attention to the analysis of concepts. But they have given decreasing attention, as compared with earlier years, to the follow-through to detailed design and manufacture or construction. It is true, that the creation of a design concept is the basis for engineering works, and we must be very careful in our educational programs to preserve and nurture creative talent. But, to be very frank about it, a small number of creative people can generate the work that requires large numbers of other engineers to complete.

It is also questionable whether the current emphasis on analysis does not inhibit the creativeness which leads to novel concepts for analysis. Creativeness and originality are possible and desirable every step in this sequence. It is also true that the range in which such creative talent can be applied becomes progressively restricted through the sequence. Those individuals who are concerned with the generation of novel concepts, with the analysis of preliminary designs, and with feasibility studies can be a very "free wheeling" group. But proceeding through this sequence, there is increasing need for limiting the attention to the particular job to be done.
Looking at this sequence, the central activity is design, including the narrow scope of subject matter which we think of as machine design and related courses in other subjects, but also design in the broad sense of selecting an objective, conceiving a means of achieving this objective, carrying through an analysis, and executing the project through to working hardware. Involved in this process are many auxiliary functions and an increasing number of people are required for them. For example, in all of these projects there is a technical kind of marketing: the process of presenting to society — corporate, industrial, or governmental — the gains to be obtained by carrying through the proposed work. There is also an increasing amount of software — the reports, the computer programs, and other auxiliary requirements which are part of the engineering process, but which are increasingly done by non-engineers. The range of opportunities is really enormous. It is much broader than corresponds to the filter imposed by engineering education today, which over-emphasizes the purely academic and de-emphasizes the practical.

There is a great need for the practical engineer

The first requirement for success in engineering practice is an impelling desire to achieve working hardware: not to be satisfied with solving the design problem in principle, but to be satisfied only with tangible, useful results. To return engineering education to preparation for professional practice requires that efforts be made to arouse student interest in the tangible results. When I say this, I do not intend to minimize the importance of science, because science is basic to the practice of engineering, but engineers must be people who concentrate on the job to be done and who cannot be deflected into interesting sidelines. The job of the scientist is important, but it is also important that we do not confuse engineering with science because engineering requires an impelling desire to do the job which needs to be done, on time and within a budget. There is a wide variation in the requirements for different positions. There is a tremendous spread of opportunities and the initial steps of any project requires creativeness, analytical ability, fundamental and intimate knowledge of applied science and experience in development work. On the other end of the spectrum, there is a great need for an increased number of engineers who have a practical knowledge and a more practical approach than is characteristic of the present graduates of most engineering schools.

The change in recent years has been much more than one of subject matter. There has been a change of viewpoint. The institutions have been permeated with the feeling that more research will automatically solve all practical problems. To me this is a fallacious view. What we have done in this country is to neglect the process of transition from scientific results to working hardware. The emphasis given in this country to science and to mathematics since the war has been sound, but now we need to give prime attention to this other aspect — to the continuing need for engineers who can conceive and create new systems, new products, new materials. In spite of the publicity to the contrary, I think we are becoming deficient in this respect.

The engineer needs to be taught to act as an engineer

One of the problems of engineers and engineering education is the balance of freedom and discipline which is required in engineering practice. We would like engineers to be creative, to conceive new developments, new applications of materials, new ways of doing old things, and ways of doing new things. But we would also like to have them to be conservative, to have a proper respect for their clients’ money, whether their client be government, or industry, or private individuals. This viewpoint is difficult to instill in the student. The practicing engineer should have a conservative respect for past experience and a recognition of the need to fully test a new design, but, at the same time, he should be willing to accept the novel, provided that the gain through novelty is justified by the advantage gained. In the past, say prior to the war, the engineering schools seem to have erred on the side of being too conservative, by giving too much attention to established design practice. But today I think we are giving undue attention to science as the basis of engineering practice. We need to find some middle ground in which there is a balance between conservatism and novelty.

Certainly all engineers need a knowledge of science and applied science, of materials, of manufacturing methods. However, no matter how much a student learns or how many years he may devote to his bachelor’s, master’s, or doctor’s degree, we cannot stuff him full of enough knowledge to last a lifetime. There are certain fundamental things which he must learn and remember but really the most important characteristic is the ability to acquire and apply new knowledge. I repeat. The ability to acquire and apply knowledge which was not in existence, which was not even mentioned in the professional literature and much less taught in courses, when he was a student. To this end, it seems to me that much more responsibility should be thrown on the student for exploring and bringing together the facts about a topic and applying it to a specific problem; that is throwing the responsibility on him to act as an engineer. I emphasize this point because, in talking about engineering education, one often hears that students must have this or that subject matter as a tool before undertaking any design problems. However, in later practice, they must acquire the ability and the interest to explore new subjects or they will join the growing number of obsolete engineers.

Technology is moving ahead with science. Fields of engineering are becoming obsolete. It is extremely important to the engineer to acquire early the ability to enter new fields, to apply new knowledge to the new problems which come up. This aspect of engineering practice should be simulated in college.
Dr. James E. Boyd: "Dean Skiles was a scholar, a teacher who believed in his profession, and a man of unquestioned integrity and sense of responsibility who insisted on high standards for all students."

Photographs by Bill Sumits, Jr.

THE GRACIOUS LADY at the right applauding a speech by Dr. James E. Boyd is Mrs. W. Vernon Skiles, widow of the legendary dean who ruled Tech with an iron hand softened by his love for people for 21 years. The occasion was the dedication of the classroom building, unnamed since it was completed in 1959, to the memory of her husband. Dr. Boyd, formerly a teacher and administrator at Tech and now president of West Georgia College, presented a short, moving portrait of Dean Skiles, the man who originally hired him away from the same West Georgia exactly 30 years ago.

16
On a perfect summer afternoon, a Tech building officially becomes the William Vernon Skiles Classroom Building and visiting the ceremony was an old friend.
Photographed by Bill Sumits, Jr.

To Robert Lee Dodd facing his twentieth season as a head coach and his first as an independent

HAPPINESS is a stable

IN THIS, the first year of independence for Georgia Tech in 60 years, Robert Lee Dodd carries the look of a man who has suddenly won the Irish sweepstakes and hasn’t yet begun to worry about all of the problems that go with a quick fortune. The reason for the smile on the face of the Tall Gray Fox is the squad with which he is approaching the moment of truth for Tech football. It isn’t that he envisions an undefeated season (although like all coaches he hopes for it always) or that he thinks that his material far outstrips his opponents (four of the 10 scheduled teams are already ranked in the top 20 nationally). It’s the character of the squad.

“I feel that it’s going to be the most interesting team to coach I’ve had in many a year, probably since 1956,” he said just before the fall practice sessions began. “But this team is more like the 1947 crowd — it has a lot of character on it, a lot of speed, a lot of fine senior leaders. You don’t mind losing with this kind of team, because you know that you have done it with the best boys you can get.”

Coming from Dodd this is the highest possible praise. For despite the undefeated 1951 and 1952 and the great 1956 years, Dodd measures everything against that 1947 team. It was his first good one, and it has his loyalty like none ever will.

Dodd continued, the enthusiasm mounting as the Tennessee-filtered words rolled out: “We have more small backs than I can ever remember on one team. And they are good football players — fast runners, solid blockers, strong defensive men. Think of the crowd appeal of a backfield composed of Bruce Fischer (5’ 8”, 157 pounds) at quarterback; Johnny Gresham (5’ 8”, 169 pounds) and Terry Haddock (5’ 11”, 176 pounds) at the halves; and Giles Smith (5’ 9”, 168 pounds) at full. They’ll be in there together before the season’s over. All of them can do the 100 in 10 flat or less, and Haddock has been clocked in a track meet at 9.6.”

Actually Dodd’s dream of a great pony backfield is just one step from reality. Gresham has been switched to left
of pony backs and some horses up front

halfback and is listed as the top man at this position above
part-time starter from last year, Gerry Bussell, another
extremely fast sprinter. Haddock is the number one right
halfback, and may be the best breakaway threat at Tech
since George Volkert of the mid-fifties. And Smith, the only
sophomore figured to break into the starting lineup, is on
the charts as the top fullback. Fischer and Jerry Priestley
are a toss-up at quarterback and will be alternated just
as were Billy Lothridge and Stan Gann in 1962 before
Lothridge broke out on top during the Florida game that
year.

Actually, replacing Lothridge will be the toughest task
facing Dodd and his staff. At least four men will be called
upon to split the duties the all American handled by him­
self for the last two years. Sophomore Bill Myddleton or
junior Jack Clark, back from a hitch in the Navy, will be
the kickoff man. Dodd figures they can handle it without
any dropoff in height or distance. Specialist Bunky Henry,
a fine competitive golfer, will handle the extra-point and
field-goal chores as well or better than Lothridge, according
to Dodd. And Fischer and Priestley have the experience
and ability to do the play-calling and passing at Lothridge's
level. But there is no punter in sight that can match Loth­
ridge's talents in this area. “Priestley, who has his good
and bad days kicking, will be given first shot at the pun­
ing,” Dodd said. “If he doesn't appear to be consistent
enough, we'll give either Giles Smith or perhaps, Fischer
a chance at it. Meanwhile, we're going to work with Forrest
Inglett, a junior, and Charlie Mason, a good sophomore
quarterback, and see if there is a chance that one of them
might do the punting job as a specialist. No matter how
I look at it, punting is at this moment our major weakness.”

But this team has other weaknesses when you start
judging it against some of its opponents. Looking at it
position by position, here's how the 1964 edition lines up:

**Ends** — Dodd considers this a weak spot because of the
loss of all-American Billy Martin and strong pro candidate
Ted Davis. Davis played half of last season and Martin
missed a couple of games because of injuries and was at
half-speed in two others. Dave Austin, a 227-pounder from
Fort Lauderdale, Florida, has everything to be great at this
position if he ever finds out how good he can be. If Austin
comes through and George Morris, the best end on the
squad, has recovered enough from the knee injury that
kept him out of action last year and most of the spring,
part of one of the biggest problems will have been solved.
On the other side Dick Emerson and Gary Williams are
both experienced but average. Back of the first four are
a series of question-marks. Another end who missed the
entire 1963 season and the 1964 spring practice, Steve
Copeland, could help make this spot a pleasant surprise
rather than the disaster area it turned out to be last year.

**Tackles** — The tackles will be at least as good as they
were last year which according to Dodd is not good enough
for greatness. Tom Ballard, the starter on the left side, is
back for his final year and may be the most underrated
man on the ball team. Assistant coaches always seem to
come back to Ballard when they talk about the best interior
lineman on this team. A strong student and one of those
senior leaders Dodd talked about, Ballard may be able
to make up for that lack of experienced depth at this
position. Back of him on the left side are Bill Moorer,
Billy Schroer, and Bert Thornton, none of whom have
ever seen a minute of varsity action. Moorer was the sen­
sation of spring practice, and Schroer and Thornton were
two of the better linemen on the undefeated freshman team.
On the other side, two experienced men, Bill Paschal and
Randy Watkins, are running one-two, but back of them
is an unbelievably quick 233-pound sophomore named
Lamar Wright who will make them all hustle. Paschal
is much like end Austin — when he realizes how much
talent he has, he should be a great one — but this is his
last try at the brass ring.

**Guards** — The picture brightens when this position is
reached. No less than five letter-winners man the two posts.
Joe Colvin, injured much of last season, is listed number
one at left guard ahead of Brad Yates who started every
game here in 1963. Gary Lee, another experienced although
FOOTBALL PREVIEW — continued

slow operator, is number three, and another one of those undefeated freshman, Claude Shook, may make everyone work a great deal harder. Jimmy Seward, last year's starter on the right side, is back and he is a good one. He will be pushed by John Battle, number two in 1963, and sophomore Bill Myddleton, a squat 209-pounder who came to play. Dodd is much better off here than he was a year ago.

Centers — The best two centers on any one team in the South man this position. Bill Curry, out part of last season because of an injury, is Tech's best pre-season bet for all-American. He is, according to offensive line coach John Robert Bell, "the best blocking center I have ever coached," and Bell has been involved with a couple who made all-America teams here. Back of him is the defensive terror of last year, Dave Simmons, now able to go both ways. Simmons was good enough to make all-SEC second team last season, and fans will see both of these healthy lads in there at the same time in crucial situations. The only problem at this position is depth. There are a couple of good, inexperienced operators back of the top two, but an injury here could turn a strength into a real weakness.

Quarterbacks — Gone is the Lothridge talent and more importantly the Lothridge confidence and luck and replacing him will be a tough task. Priestley and Fischer have already been discussed briefly, but it might be added here that Priestley is the better passer, especially from the drop-back position, while Fischer is the superior runner and roll-out passer. Dodd doesn't believe that any of the three great freshman quarterbacks of last year will beat either of the two old hands out. Kim King, Charlie Mason, and Bill Eastman may all be held out this year barring injury, although Mason's punting ability may get him the first shot at playing if the other punting candidates don't come through. All three of these quarterbacks will play before they leave Tech but probably not this year.

Halfbacks — Here is where Tech is really loaded. Gresham, Bussell, Haddock, Jackson, Danny Faulk, Craig Baynham, and sophomore Haven Kicklighter could all grace any squad. Gresham has been a regular, plagued on and off with injuries for two years. A natural leader, he is the first athlete to be elected senior class president since 1947. He can do everything and will. Haddock, also out some last year with injuries, was the top back by a large margin in spring practice. Jackson and Bussell are experienced two-year lettermen, just a shade short of the first two in running ability. They will be the second two-some and may be platooned to play much of the defense this fall. Baynham came to Tech as the most heralded back in a long time, but injuries have stymied him since he arrived on the campus. If he finds himself, the 200-pounder may move one of the first four out of there. Faulk had an operation this spring but is a good all-around back who may see a lot of action on defense, which is his special talent. Kicklighter, best of the first-year men in spring practice, is out with an injury. He is a Paul Rotenberry-type and if any injuries hit at this position he could wind up back in action. Jimmy Cavan, another defensive specialist, may also see some action.

Fullbacks — Smith, as previously indicated, has the inside track for this job. Dodd looks upon this position as another halfback post because of the slot-T offense Tech now uses. Jeff Davis, the defensive star of the 1962 Alabama upset, is back after a year of rest to recover from a pair of knee operations. If the knee holds up he will give Smith plenty of competition for the job and may end up playing it regularly, at least on defense. Johnny Nix and sophomore David Barber (brother of last year's alternate fullback) are both capable of playing here once they acquire some game experience. But Dodd may move one of the halfbacks over to full (possibly Baynham) if Davis' knee doesn't hold up. This is not the weak spot the coaches thought it would be at the end of last season, despite the fact that not a man has any game experience at the position.

The schedule this year is not as tough as the one Dodd has been playing for the past 10 years. Vanderbilt, Miami, and Navy replace LSU, FSU, and Florida. But last year, Tech beat both the Florida teams and lost to LSU by one point in Baton Rouge, so Dodd has gained little in the exchange. Vanderbilt, under a new coach, Jack Green, won only one game last year but figures to be improved. Miami, sans George Mira and with Charlie Tate at the helm, figures to be a tough defensive team but has little to offer offensively except a couple of excellent running backs. But Tate knows the Tech system and would probably rather win this one than any game on his schedule. Clemson, smarting from two consecutive trouncings by Tech, will also be coming in with more than the average amount of blood in the eyes.

How do you replace a Lothridge with less than four men?
from last year's team which closed the season as the number two team in the country. Tech ancient jinx on the Midshipmen will have to hold firm if the Jackets are to get by this one. Then comes Auburn featuring Jimmy Sidle and most of the great squad that went 9-1 last season. With Tech facing the Tigers in Birmingham, Dodd figures this will be an extremely tough one to win. Tulane, the homecoming opponent, figures to be better than last year, but it is still the weakest team on the schedule.

Tech then takes to the road to face Duke which is also figured in the top 20 in the preseason polls and is thirsting for revenge after last year's beating here. Tennessee—sporting a new coach and finally switching to the "T"—is an absolute mystery. The Vols do have Steve DeLong, the best interior lineman in the South, and will be no soft touch. Bear Bryant gets what may be his last crack at Tech on November 14 on Grant Field. And with Dodd feeling the same way, this should be one of the great games of this or any other season. The Jackets wind it up with Georgia in Athens. The Bulldogs also have a new regime but are not figured to be one of the top teams in the South this year.

Dodd figures Tech should be a favorite against Vandy, Miami, Clemson, Tulane, Tennessee, and Georgia, and the underdog against Navy, Auburn, and Alabama. He rates the Duke game as a tossup, and states flatly: "I'll settle for a 7-3 season again this year."

Tech will stay with most of the SEC rules even though it is no longer a member of the conference it helped found. The one exception will show up in 1965 when Dodd plans to play two freshman games off-campus (the SEC frowns on playing freshman games any place except on a college campus). Miami will be scheduled in Jacksonville and FSU in Moultrie in 1965 according to Dodd's current plans.

The coaching changes at Tech brought on a few surprises. Jim Carlen, six years a member of the Tech staff, takes over as chief of defense after three years under the departed Charlie Tate. Despite Carlen's comparative youth, Dodd figures that he can handle the job and spring practice backed him up in the decision. Richard Bell, two years at VMI and a former Arkansas lineman, will take over Carlen's old duties and completes the varsity staff. Jack Fligg, highly successful Grady High coach and one of the most respected young coaches in Georgia high school circles, is the new freshman coach replacing the departed Bill Fulcher.

But the big shock came when Dodd announced that Johnny Griffith, the recently deposed head coach at Georgia, would join the Tech staff on a part-time basis as a scout. Griffith knows Georgia high school football well and despite his problems at Georgia is an excellent football man. Dodd figures he has scored a coup of sorts in convincing Griffith to help out. If it works it will not be Dodd's first coup or his last.

---

**Nothing gets you into Tech football action like**

**Yellow Jacket-Confidential**

Exclusive pictures by Bill Sumits, Jr. and Bill Diehl, Jr., along with the intimate copy of Bob Wallace, Jr., bring the readers of Yellow Jacket-Confidential closer to the action wherever the Jackets play. You get 10 game letters plus a spring bonus letter for $4.00 ($5.00 air mail). This year you also get a special preseason letter to be mailed out a week before the first game and during bowl years, another bonus letter. Order now to be sure you get the 1964 fall bonus letter.

Order your on-the-scene report of all Tech games for 1964 starting with the special preseason letter by filling in the enclosed blank and sending it with your check for $4 ($5 for air mail)

NAME _______________________________________
ADDRESS ____________________________________________
CITY ________________________________________________

**Yellow Jacket-Confidential**

PUBLICATIONS BOX • GEORGIA TECH
ATLANTA, GEORGIA 30332

SEPTEMBER 1964
Tech sets record month in grants

IN THE PERIOD between mid-May and mid-June, Tech announced receipt of 14 research, educational, and equipment purchase grants totaling $965,893.

Largest of the grants was the $600,000 research allocation from the National Aeronautics and Space Administration (NASA), which Paul Weber, dean of Faculties, called proof of the civilian space agency's continued and growing interest in developing Tech as a center of space related education and research.

This grant is in addition to the $1 million assigned to Tech by NASA in April for construction of the first building in Tech's proposed three-building Space Sciences and Technology Center.

Funds from the NASA research grant will support expansions of multidisciplinary programs in materials, transport phenomena, energy conversion, systems, and nuclear processes. These projects are also expected to have significant effect in further strengthening graduate education.

Administering the new grant will be Tech's Space Sciences and Technology Board created last year to stimulate multidisciplinary research aimed at increasing the level of basic scientific understanding and engineering knowledge for the nation's space programs. Board chairman is K. G. Picha, director, Mechanical Engineering, with Vernon Crawford, director, Physics, serving as co-chairman. The board will review research and educational accomplishments made possible by the grant and continually examine the relationship of other space related research and educational activities at Tech to new work to be supported by NASA funds.

The board plans to sponsor conferences and symposia where progress and research results from space science and technology may be disseminated to researchers throughout the nation, to industry, business, and other segments of the economy. Through such gatherings these various groups can be made aware of new opportunities for applying developments from the space program. Such a procedure is called a "spin-off" in Space Age terminology.

Other grants included in the total:
- A $202,406 U. S. Public Health Service award for support of a graduate student training program in water resources engineering. The grant makes possible 31 graduate scholarships for the recently-created Water Resources Center on the Tech campus. The five-year program got under way on July 1.
- A $19,900 National Science Foundation grant for support of a research project involving "sandwich" plates which are now widely used in aircraft and space vehicle construction. (The sandwich plates consist of relatively thin sheets of high strength bonded to a light-weight inner core often of plastic foam or honeycomb aluminum and steel. Sandwich plates are useful wherever high strength to weight demands are found. They are used in curtain wall construction of buildings and in truck and railroad refrigeration cars for their excellent insulating properties. The effects of stress and loading on these sandwich plates are quite difficult to determine.) The research project, directed by Dr. C. E. S. Ueng, Engineering Mechanics, will attempt to relate the behavior theory of sandwich plates to that of homogeneous plates which is better understood. Homogeneous plates are formed of a single material.
- A $16,200 National Science Foundation grant for support of a research project on "Microwave Spectroscopy." Principal investigators for the project are Dr. T. L. Weatherly and Dr. J. Q. Williams, Physics.
- A Petroleum Research Fund grant of $7,900. The grant will be used for support of Dr. Raymond Kimbrough's (Chemistry) research project, "Reactions of Sterically Hindered Cyclobutanones." The Petroleum Research Fund is administered by the American Chemical Society.
- National Science Foundation grants totaling $63,000 for the support of three separate projects with the same title, "Undergraduate Instructional Scientific Equipment Program." These projects will be directed by Dr. W. E. Moody, Jr., Ceramic Engineering; Dr. P. Vidojevic, Mechanical Engineering; and Dr. W. M. Spicer, Chemistry.
- An additional grant of $12,000 from the National Science Foundation for the support of the "Development of Graduate Degree Programs in Information Science." This program is under the direction of Dr. William F. Atchison, director, Information Science.
- Other grants included in the total funds provided for this project are now in the amount of $72,380.
- A $28,487 grant from the U. S. Public Health Service for continuation of a five-year graduate research program in dental metallurgy. The program, in its second year, is directed by Dr. Robert F. Hochman, Chemical Engineering. The total grant for the five years is $128,000.
- Two grants to the Textile School. One is from the Textile Education Foundation, Inc. for $8,000 for the purchase and installation of new equipment. And the other is from the Scholler Foundation of Philadelphia for $5,500 to finance a graduate research program.
- And an educational grant of $4,500 from the Babcock & Wilcox Company. This grant is part of a nine-year-old program in which the company has allocated over $1 million to various colleges and universities.

Faculty promotions announced by Dean Weber

FACULTY PROMOTIONS at Tech for the year 1964-65 were announced in July by Dr. Paul Weber, Dean of Faculties.

Heading the list is Dr. Vernon D. Crawford, who has been appointed Director of the School of Physics. A full professor, Doctor Crawford has taught physics at Georgia Tech since 1949. Dr. Joseph H. Howey, former Director of the School of Physics, requested to be relieved of the duties of Director but will continue as professor.

The rank of full professor was given to Mr. H. Griffith Edwards, Architecture; Dr. Robert H. Fetner, Applied Biology; and Dr. Harrison M. Wadsworth, Industrial Engineering.
"Should be required reading," *The Atlanta Journal-Constitution*

This new history of Georgia Tech, published last fall, stayed on the best-selling list in Atlanta until after Christmas. Over 6,000 Tech men have already purchased the book that *Atlanta* magazine called, "well researched, well written, specialized history with more than a specialized appeal. With a good sense of the narrator’s skill, an eye for drama and humor, and, without sentimentality, a deep feeling for the institution and men who made it, Mr. Wallace writes a book that one (if such might be imaginable) who never before heard of Tech would enjoy."

*Dress Her in White and Gold* has received excellent critical reviews and more importantly the plaudits of the many Tech alumni and friends who have read it in the first months after publication:

"Reading *Dress Her in White and Gold* has been a tremendous experience," says a Houston alumnus • "The Book is great," reports a Chattanooga alumnus • "Either the book is exceptional or my love for Tech is deeper than I thought," says a Memphis alumnus • "A beautiful and moving book," writes the wife of a Tech official • "I have never read anything of its type to equal it," a Macon alumnus writes • "One gets a heaping dose of how Tech has ticked while under the impression that one is reading a novel," writes a Tech staff member • "One of the best books of this or any year," says an official of another college • "A good job, warm but professional," comments an Atlanta writer.

The book, over two years in the researching and writing, contains 426 pages of text and 32 pages of pictures from the collection of George Griffin plus sketches by the author's wife of Tech's six presidents. Included in the text section are selected appendices including complete scores of all of Tech's football games through 1962.

Please send me a copy of *Dress Her in White and Gold* and bill me after I receive the book ($5.00 includes postage and sales tax).

Name

Permanent Address

City and State

Class and Course

Fill out and return to: Georgia Tech Foundation, Inc., Georgia Tech, Atlanta 30332
Other faculty members receiving promotions were as follows: To the rank of associate professor: Dr. A. J. Cooper, Industrial Management; Mr. James J. Cox, Chemistry; Mr. Donald M. Friedlen, Mathematics; Dr. R. E. Green, Industrial Management; Dr. Paul B. Han, Industrial Management; Mr. A. Lewis Holliman, Mechanical Engineering; Dr. John W. Hooper, Electrical Engineering; Dr. Harold R. Hunt, Chemistry; Dr. George A. Miller, Chemistry; Dr. John D. Neff, Mathematics; Dr. Frederick G. Pohland, Civil Engineering; Dr. Daniel A. Robinson, Mathematics; Dr. Larry J. Rubin, English; Dr. Paul H. Sanders, Civil Engineering; Dr. Peter B. Sherry, Chemistry; Mr. George M. Slaughter, Civil Engineering; and Dr. James T. Wang, Engineering Mechanics.

To assistant professor: Mr. Joseph M. Adams, Engineering Graphics; Mr. Winston C. Boteler, Textile Engineering; Mr. Frank I. Day, Industrial Engineering; Mr. N. S. Kendrick, Physics; Mr. T. C. Lintheum, Engineering Graphics; Mr. Charles W. McGuirt, Aerospace Engineering; Mr. Thomas D. Philips, Social Sciences; Mr. Robert H. Smith, Engineering Graphics; Mrs. Charlotte R. Tatro, Social Sciences; Mr. Alton P. Jensen and Mr. J. Wade McKoy, research engineers; Dr. Vedene H. Smith, Jr., research physicist; and Mr. Albert W. Bowers, Mr. Hugh W. Denny, Mr. Jerry L. Eaves, Mr. William C. Eisenhauer, and Mr. Joseph C. Mullins, assistant research engineers.

Top scientist named Neely professor

Dr. NATHAN W. SNYDER, formerly a key member of the technical team which helped initiate the U. S. space program under the Department of Defense, has been appointed the Neely Visiting Professor of Nuclear Engineering at Tech.

He is leaving his position as chief scientist of Kaiser Aerospace and Electronics Corp., a subsidiary of Kaiser Industries Corp., Oakland, California.

Dr. Snyder's work at Georgia Tech will involve research and teaching in nuclear and space-oriented subjects with special attention directed to Georgia's future technological growth. He will continue to serve as a scientific advisor to the federal government in several areas. Dr. Snyder is a consultant to the Institute for Defense Analysis and the Air Force. He participated as a panel member of the Air Force's recent PROJEC FORECAST.

While in Washington from 1958 to 1961, Dr. Snyder was a member of the Department of Defense's Institute for Defense Analysis and Advanced Research Projects Agency. He was in charge of an initiated program in electric power generators for spacecraft and consulted on such programs as Tiro, Transit, Saturn, Centaur, Midas, Defender, and Advanced Propulsion Systems. He helped develop guide lines for the Defense Department on standardization of launch vehicles and spacecraft.

Before joining the Department of Defense's space technology team, he was chairman and professor of Nuclear Engineering at the University of California, Berkeley, where he initiated and developed that department between 1955 and 1958. He was a member of the faculty from 1942, performing research in both engineering and applied physics.

Dr. Snyder has authored many technical papers and is editor of two volumes, "Energy Conversion for Space Power" and "Space Power Systems." He was an invited lecturer on space power at the 1960 International Astronautics Conference in Stockholm.

McKeever elected 1964-65 alumni president

DANIEL A. MCKEEVER, president of J. E. Hanger Company, Atlanta, Georgia, has been elected president of the Georgia Tech National Alumni Association for 1964-65. McKeever, who has served as vice president of the Association for two years, succeeds William S. Terrell, Charlotte, North Carolina.

Elected to serve as vice presidents were Alvin M. Ferst, assistant vice president of Rich's, Inc., Atlanta, and Madison F. Cole, Mutual Life Insurance Company of New York, Newman, Georgia. L. Lawrence Gellerstedt, president of Beers Construction Company, Atlanta, was elected treasurer.

Trustees named for the coming year are Herbert A. Bolton, '32, Griffin; L. Massey Clarkson, '50, Atlanta; James R. Dellinger, Jr., '53, Cartersville; J. Leland Jackson, '35, Macon; J. Erskine Love, Jr., '49, Atlanta; Dan I. MacIntyre, III, '40, Atlanta; Frank Newton, '25, Birmingham; C. T. Oxford, '30, Albany; Dr. Kenneth G. Picha, '46, Atlanta; John P. Pickett, '32, Cedar-town; James B. Ramage, '37, Atlanta; Dr. John P. Ridley, Jr., '45, Atlanta; Glen P. Robinson, Jr., '48, Atlanta; William P. Rocker, '32, Atlanta; S. B. Rymer, Jr., '37, Cleveland (Tenn.); John B. Smith, Jr., '55, Atlanta; William S. Terrell, '30, Charlotte; John S. Thibadeau, '47, Decatur (Ga.); and Ed L. Yergan, '32, Rome.

The President goes over the top

PRESIDENT EDWIN D. HARRISON participated in a 13-day, 13,000 mile Air Force inspection tour of the top of the world during late July.

Dr. Harrison and seven other prominent educators were invited by Major General Cecil E. Combs, Commandant of the Air Force Institute of Technology, Air University, Wright-Patterson AFB, Ohio, and Major General Robert H. Curtin, Director of Air Force Civil Engineering, Hq USAF, to make the annual polar circuit.

Tech's West awarded top honor

GEORGA TECH Sports Information Director Anonymous was awarded the highest honor in his profession, the Arch Ward Memorial Plaque, by his colleagues in Chicago on August 6.

A veteran of 12 years service at Tech, West was among the pioneers in creating a separate bureau for college information directors.

The plaque, presented by Syracuse information director Val Pinchbeck, was inscribed: "In recognition of outstanding contribution to the College Sports Information Directors of America by establishing and maintaining a level of performance which has brought great credit to his institution, intercollegiate athletics and to the profession."

AMERICUS, GEORGIA — An organizational meeting of the Americus Georgia Tech Club was held on July 6 at the Sumter County Court House. A group of 15 men turned up for the meeting to discuss the new club and hear three visitors from Atlanta talk about Georgia Tech. Coach John Robert Bell and Coach Jim Luck, formerly located in Americus, talked about the new status of Tech as an independent as well as about football prospects for 1964. Roane Beard, alumni secretary, talked about club programs and projects. Officers elected for the coming year were T. Griffin Walker, president; Lynn C. Fowler, vice president; and William S. Harris, secretary-treasurer.

LOS ANGELES, CALIFORNIA — Approximately 100 members and guests turned out for the May 22 dinner meeting of the Georgia Tech Alumni Association Club of Southern California in Los Angeles. Dean George Griffin, who was the guest of honor and principal speaker, entertained the enthusiastic crowd with stories of his unforgettable career at Tech. The meeting was presided over by Bill Schleich, current president of the club.

Dean and Mrs. Griffin completed their Southern California visit by spending an
enjoyable day at Disneyland as guests of the Bud Lindseys.

SAN FRANCISCO, CALIFORNIA—Reorganization of the San Francisco Club, spearheaded by Terrell W. Hill, of San Francisco, and William E. Moore, Atherton, California, brought about a double-header meeting on May 25. The first, a luncheon held in San Francisco, drew 30 Tech alumni. That evening, 86 Ramblin’ Wrecks gathered in Palo Alto at a dinner meeting where Moore and Hill were elected president and secretary, respectively, for the coming year.

Retiring Dean George Griffin and Mrs. Griffin were guests at the get-togethers, at which “Mr. Georgia Tech” relived his rendition of the Tech story with its inimitable wit.

The alumni group, to be known as the “Georgia Tech Northern California Club,” made firm plans to become active and schedule meetings regularly. It was voted that the club formally apply for a charter and initiate and maintain a scholarship to enter local California boys at Tech. Enough pledges were secured at the evening meeting to sponsor the scholarship and to begin laying plans to select the recipient.

TALLAHASSEE, FLORIDA—Coach Jack Griffin spoke to the Big Bend Georgia Tech Club on May 12 in Tallahassee. President-elect Joe S. Beazley reports a good turnout for their first meeting. President Moore and Hill were elected president and secretary, respectively, for the coming year.

We were recently advised of the death of G. A. Hubbard, EE, of 823 Virginia Avenue, N.E., Atlanta, Georgia. Charles Howard Mooney, ME, formerly of Atlanta, died June 6 in Montgomery, Alabama. He was associated with the Kerschaw Manufacturing Company.

Andrew L. DeForest, 1274 Oxford Road, N.E., Atlanta, Georgia, died November 26, 1963.

Dr. Harold M. Spurlin, CH, will receive the Anselme Payen Award of the ACS Division of Cellulose, Wood & Fiber Industry this fall. He is technical assistant to the director of Hercules Powder Company’s research center, Wilmington, Delaware.

Col. Joseph B. Duckworth died July 26 in Albion, Michigan. He was formerly a captain with Eastern Air Lines and during World War II was a commanding officer at Bryan AFB, Texas.

Ernest L. “Pop” Gunn, Jr., ME, president of Minute Markets and Jiffey Stores, Inc., Atlanta, died July 10 in a local hospital. He is survived by 2 daughters and a son.

Charles H. Parr, Com, died June 19 at his home. His widow lives at 266 Winnona Drive, Decatur, Georgia.

Carlton David Dougherty, CH, died June 19. He was vice president of a New York City industrial engineering firm and was executive director of engineering for the Yale and Towne Manufacturing Company. His widow lives at 17 Crestview Road, Denville, New Jersey.

Charles F. Wysong, CerE, Associate Professor of Ceramic Engineering at Georgia Tech and president of Southern Porcelain, Inc., died July 22 in an Atlanta hospital. His widow lives at 2610 Winslow Drive, N.E., Atlanta, Georgia.

Calver Kidd has been re-elected for a second term as president of the Georgia Industrial Loan Association. He is owner of the Georgia Management Company and Calver Kidd Drug Company in Milledgeville, Georgia.

James F. Wyatt, ME, has been elected a vice president of the Hartford Insurance Group. He lives at 32 Wardwell Road, West Hartford, Connecticut.

SEPTEMBER 1964
C. Calhoun Todd, '35, has been promoted to vice-president-production of the newly formed Minerals & Chemicals Division of Minerals & Chemicals Philipp Corporation, Menlo Park, New Jersey. The subsidiary companies will operate as part of the new division.

Joseph E. Treadway, '40, has joined the professional fund-raising organization of Grizzard and Haas. He will assist primarily in helping expand the company's services throughout the state and southeast. Treadway was formerly associated with Hallmark Cards, Inc., Kansas City, Mo.


Travis A. Turberville, '48, has been named operations superintendent of the Reynolds Metals Company Listerhill reduction plant. From 1960 until this promotion, Turberville had been reduction plant superintendent. He resides with his wife and two daughters in Sheffield, Ala.

'46 Kendall Greene, ChE, has been named general manager of Research and Development of Goodrich-Gulf Chemicals, Cleveland, Ohio. He will continue to direct commercial development activities. Mr. Greene lives in Solon, Ohio.

LCDR Donald R. Patch, USN, former Operations Officer at the U.S. Navy Fleet Weather Center, Guam, is now Staff Meteorologist for Commander Barrier Forces Pacific at the U.S. Naval Air Station, Barber's Point, Hawaii.

'47 Engaged: Robert Sanford Kelley, EE, to Miss Gwendolyn Marie Hamilton. Mr. Kelley is with Lockheed, Marietta, Georgia.

James Bradley Downs, Jr., Chem, is Chief of the Umbilical Arms Section of the Launch Support Equipment Engineering, John F. Kennedy Space Center, Capt Kennedy, Florida. He is stationed in Huntsville, Alabama and lives at 411 Meadow View Road, S.E.

Herbert H. Rogers, CE, has been appointed Regional Program Director of the Southeastern Region of the Division of Water Supply and Pollution Control with the Public Health Service with headquarters in Atlanta, Georgia.

'49 Frank Cartmell, CE, is now with the Bureau of Public Roads in Juneau, Alaska.

Kenneth A. Erikson, IE, has been appointed chief accountant for the Agricultural Division at Monsanto's Luling, Louisiana plant.

George Lane has been transferred to the Ethyl Corporation's Baton Rouge facility where he is Director, Costs and Budgets. He lives at 745 Woodhaven Drive, Baton Rouge, Louisiana.

Major Clarence O. Little, Jr., USAF, TE, graduated in June from the U. S. Air Force Command and Staff College at the Air University, Maxwell AFB, Ala.

A. C. Osburn, Jr., IM, has been transferred by the John Deere Company from Lakeland, Florida to Albany, Georgia, where he is manager of the company's transfer house and co-owned dealership. His mailing address is Box 729, Albany, Georgia.

Walter Rooney, EE, received his doctorate in public administration from American University in June. He is Associate Director of ITT Communication Systems. He lives at 78 Elbert Street, Ramsey, New Jersey.

'50 Emory D. Ayers, CE, has been appointed manager of the Central Industrial Engineering Department with Union Carbide Corporation, 270 Park Avenue, New York, New York.

Henry C. Choute, TE, has organized the firm of Insurance Engineering Service, 6518 14th Street, North, St. Petersburg, Florida. The firm is engaged in specialized safety engineering services for casualty and fire insurance companies in Florida.

Emil J. Docekal, CE, has been promoted to Chief Manufacturing Engineer at Lockhead, Marietta, Georgia.

Major Joseph P. Gleason, USAF, IM, graduated in June from the U. S. Armed Forces Staff College, Norfolk, Virginia. He is now assigned to Chateauroux Air Station, France.

Major Robert E. Lucas, USAF, AE, graduated in June from the U. S. Armed Forces Staff College, Norfolk, Virginia and is now assigned to Headquarters, Office of Aerospace Research, Washington, D. C. as an aeronautical engineer.

Julian Coke Molley, III, IM, received his masters from the University of Santa Clara in June.

Born to: Mr. and Mrs. Robert J. Roos, ChE, a third son, Stephen Sullivan, June 20. Mr. Roos is with Dow Corning Corporation. They live at 2338 Beecher Circle, S.W., Atlanta, Georgia.

Major David L. Smith, USAF, EE, graduated in June from the U. S. Air Force Command and Staff College at the Air University, Maxwell AFB, Alabama.

Capt. Forist G. Dupree, USAF, ME, graduated in June from the U. S. Air Force Command and Staff College at the Air University, Maxwell AFB, Alabama.

Married: Terrell N. Lowry to Miss Judith Kingman, January 4. Mr. Lowry is head of the Exploratory Development Department at Bell Telephone Laboratories. They live at 927 East Broad Street, Apt. 901, Columbus, Georgia.

Harold E. Matson, IM, is now responsible for space and defense contraction marketing with U. S. Steel's new space and defense marketing unit in Pittsburgh, Pennsylvania. He has been with the company since 1952.

We were recently notified of the death of Ray A. Pfaffman, CE. He was a project engineer with Union Bag-Camp Paper Corporation, Savannah, Georgia.

'52 Mayo Carrington, AE, received his masters in mechanical engineering from the University of New Hampshire in June.

Married: Eric E. Crake, EE, to Miss Sandra Constantino, August 8. Mr. Crake is vice president of the Louisiana Supply Company, Baton Rouge, Louisiana.

Born to: Mr. and Mrs. C. A. Peavy, IM, a son, Kenneth Alton, June 9. Mr. Peavy is with Perry Manufacturing Company. They live at 341 Marion Street, Mt. Airy, North Carolina.

Col. David M. Rassee, Jr., USA, received the Army Commendation Medal upon retiring at Fort Leavenworth, Kansas after more than 20 years of service.

Born to: Mr. and Mrs. Roy Warren, EE, a son: John Robert, May 12. Mr. Warren is District Plant Manager with Southern Bell in Marietta, Georgia.

'54 Capt. Boris E. Bright, USAF, EE, has received his masters in electrical engineering from the University of Florida.
The domino-shaped box in the drawing above represents a communications satellite orbiting the earth.

The various angles and positions of the box show the relative positions of the satellite during one orbit.

The drawing was made, not by a man, but by a computer at Bell Telephone Laboratories to help scientists visualize how the satellite would behave.

What the computer did is called simulation. Working from data given it, the computer calculated, or simulated, the satellite's position at various instants and produced the picture on microfilm. The picture told us what we needed to know.

We use such simulation a great deal to save time and hold down costs in developing and testing new products and services.

Computers help us plan coast-to-coast transmission systems, new switching logic, and data systems. They also help us study problems relating to telephone usage at given times of the day or year.

Not all of our simulation is done on computers. Often we can simulate by other means.

We test new kinds of undersea telephone cables in buried, brine-filled steel pipes that duplicate the pressures and temperatures of the ocean's bottom at various depths.

Ingenious equipment in one of our laboratories sends test telephone pulses racing around an electronic ring that simulates a 6000-mile circuit containing 5300 repeaters to boost voice volume.

Many additional examples of simulation could be cited. Often they help us spend our time and money more efficiently in developing new services and improving present ones—in making sure that America continues to enjoy the world's finest telephone service at the fairest possible prices.
NEWS BY CLASSES—continued

engineering from the Air Force Institute of Technology at Wright-Patterson AFB, Ohio. He is now assigned to the Air Force Missile Development Center at Holloman AFB, New Mexico.

Francis Dillman Griffin, EE, is an Electrical Experimental Equipment Aerospace Technologist at NASA's John F. Kennedy Space Center.

Dr. Charles L. Phillips, EE, is an associate professor of electrical engineering at Auburn University, Auburn, Alabama.

Married: George J. Rabstejnek, Jr., IE, to Miss Patsy Ann Kidd, July 17. Mr. Rabstejnek was recently promoted to manager of Procurement Engineering and Research at IBM. They live at Apt. 3-C, Vassar Gardens, Poughkeepsie, New York.


Engaged: J. Donald Brock, BC, to Miss Cecilia McDaniel. The wedding will take place September 11. Mr. Brock and Miss McDaniel are both attending Candler School of Theology at Emory University.

Capt. Joseph Canepa, Jr., USA, IM, received his Bachelor of Law degree from St. Johns University. He is currently serving with the Jud Advocate General's Corps, Fort Eustis, Virginia.

L. R. Crawford, USN, IE, has been selected to undergo a one year course in Management and Industrial Engineering at Rensselaer under the Navy’s post graduate program. The past three years he has been with Patrol Squadron 56 in Norfolk. His current address is 65 New Sparrowbush Road, Latham, New York.

Born to: Mr. and Mrs. Daniel F. Laird, a son, Lance Daniel, March 2. Mr. Laird, is Minister of Youth at the First Baptist Church, Gainesville, Florida. They live at 2823 N.E. 14th.

Born to: Mr. and Mrs. John Almond Pierce, a son, Blake Ashley, April 27. They live at 7430 Darnell, Houston 36, Texas.

Don Paige Pullum, ME, has been promoted to senior engineer-process, at DuPont's Camden, South Carolina plant.

Dr. Lyle D. Wescott, Chem, is with a research group at Humble Oil & Refining Company's Baytown, Texas refinery. He lives at 5425 Lillian Street, Baytown, Texas.

'T60 Engaged: Mr. and Mrs. Daniel J. Arthur, IE, a daughter, Christine Ann, January 24. Mr. Arthur is with Eitel McCullough, Inc. They live at 1671 Longspur Avenue, Sunnyvale, California.

Lt. Edward L. Carron, USAF, IE, has graduated from the U.S. Air Force training course at Nellis AFB, Nevada. He is now assigned to Pacific Fleet Forces at Kadena Air Base, Okinawa.

Gerald P. Carson, Jr., USA, BC, has been promoted to the rank of Captain. He is Assistant Aviation Officer of the 11th Combat Engineering Group, Heidelberg, Germany.

Maj. Florian O. Cornay, USA, EE, recently graduated from the regular course at the U.S. Army Command and General Staff College, Ft. Leavenworth, Kansas.

Engaged: William Moore Grimes, Math, to Miss Frances Bailey. The wedding will take place October 17. Mr. Grimes is a member of the board and director of scientific programming with Management Science Atlanta, Atlanta, Georgia.
Meet a front-line member of GM's management team . . . the on-the-job manager who makes things go in a General Motors plant. In his job, he is a man of many talents.

He interprets blueprints, sketches, orders, ideas . . . and he puts them into action. He trains workers and places them in jobs they are best qualified for. And he is responsible for the performance and safety of his men, as well as for the quality of their work.

There are 16,000 foremen in GM . . . a great many of them up from the ranks of the men they supervise. Their knowledge, experience and judgment are essential to General Motors progress.

People—able, dedicated people—are GM's greatest asset . . . and none is more important than the foreman, a capable, experienced member of the General Motors management team.

GENERAL MOTORS IS PEOPLE . . .
Making Better Things For You
NEWS BY CLASSES—continued

Married: Michael Thomas Wilson, IM, to Miss Gwendolyn Cawthon, August 29. Mr. Wilson is with the George L. Wilson Realty Company, Atlanta, Georgia.

Engaged: G. Glenn Barnwell, Jr., Chem, to Miss Bettina Louise Hall. The wedding will take place August 30. Mr. Barnwell is a student at the Medical College of Georgia, Augusta, Georgia.

Lt. Douglas R. Church, USAF, IM, has completed a demolition and mine warfare course at the U. S. Army School in Murau, Germany. He is a platoon leader in the 55th Engineer Company.

Lt. Richard T. Drummond, USAF, IM, has been awarded his U. S. Air Force wings following graduation from flying training at Williams AFB, Arizona. He is now assigned to his unit of the Georgia Air National Guard at Dobbins AFB, Georgia.

Engaged: David Lee Fuller, AE, to Miss Joan Avent, July 18. Mr. Fuller is with the research division of Scripco, Inc., Atlanta, Georgia.

Terry F. Greenwood, ME, is now a project engineer with Brown Engineering Company. He lives at 417 Julia Street, Apt. 200, Huntsville, Alabama.

Robert M. King, ME, is now a student at the Medical College of Georgia, Augusta, Georgia.

Married: Charles Thomas Huber, Chem, to Miss Robin Sue Hickman, June 1. Mr. Huber is attending graduate school at Florida State University.

Born to: Mr. and Mrs. G. Hal Martin, JE, a daughter, Deborah Lynne, November 3, 1963. Mr. Martin is with DuPont. They live at 2200 Chalfont Drive, Apt. 28, Richmond, Virginia.

Engaged: James Carl McRae, Jr., IE, to Miss Bettye Neal Johnson. The wedding will take place September 12 in Dothan, Alabama.

Capt. Allan W. Morton, USAF, is stationed at Clark Air Base in the Philippines. He is Chief of Engineering and Construction. His address is 405th Civil Engineering Squadron, APO 74, Box 45, San Francisco, California.

Engaged: John S. Pattillo, Jr., CE, to Miss Andrea Hamilton. The wedding will take place September 5.

Lt. Lee R. Reid, Jr., USA, IM, is with the 11th Air Assault Division at Ft. Benning, Georgia. His permanent mailing address is 1444 Eastover Drive, Jackson, Mississippi.

Donald C. Savage, IM, has been assigned to the staff of Goodyear’s printer’s sales department in New Bedford, Massachusetts.

Lt. John Selinmer, USAF, IM, graduated from pilot training in May at Laughlin AFB, Texas. He is now assigned to Tachikawa Air Base, Japan.

Engaged: Joel Franklin Stone, Jr., CE, to Miss Kathryn Broome, May 27. Mr. Stone is with the U.S. Army Chemical Corps, Ft. Leonard Wood, Greer, South Carolina.

Fitzhugh L. Wood, IM, has been commissioned a second lieutenant in the U.S. Air Force following graduation from Officer Training School at Lackland AFB, Texas.

Married: Lt. Larry Lamar Doster, USA, IM, to Miss Sandra Marie Wingo, June 27. Lt. Doster is stationed at Fort Benning, Georgia.

Engaged: Robert Westbrooke Jones, II, IE, to Miss Jeanette Evans. The wedding will take place August 8. Mr. Jones is with Union Carbide Corporation.

Married: Thomas Daniel McClure to Miss Patricia Head, June 20.

Engaged: Lewis Gildart Minor, EE, to Miss Patricia Diakos, August 22 in Decatur, Georgia. Mr. Minor will attend graduate school at Louisiana Tech this fall.

Ashok Kumar Raijal is a design engineer with the State Road Commission of West Virginia. He lives at 321 Michigan Avenue, Charleston, West Virginia.

Promoted to first lieutenant at Ft. Bliss, Texas where he is serving with the U. S. Army Air Defense School.

Charles G. Guflery, ChE, has joined the Technical Division, Conversion Section, Humble Oil, at Baytown, Texas. His address is Villa Caprice Apts., Apt. 27-A, 2303 Midlane, Houston, Texas.

Lt. Kenneth J. Gurry, USAF, CE, has completed the U.S. Air Force Survival and Special Training School at Stead AFB, Nevada and is now assigned to a unit of the Air Training Command at Perrin AFB, Texas.

Married: Charles Thomas Huber, Chem, to Miss Robin Sue Hickman, June 1. Mr. Huber is attending graduate school at Florida State University.

Born to: Mr. and Mrs. G. Hal Martin, JE, a daughter, Deborah Lynne, November 3, 1963. Mr. Martin is with DuPont. They live at 2200 Chalfont Drive, Apt. 28, Richmond, Virginia.

Engaged: James Carl McRae, Jr., IE, to Miss Bettye Neal Johnson. The wedding will take place September 12 in Dothan, Alabama.
Is it possible that a leading maker of jet engine turbine blades had a hand in giving Pat Deegan a fresh sandwich today that was made last night?

It's perfectly logical to assume that the nation's leading producer of alloying metals like chromium, manganese, tungsten, and vanadium could become an expert on their use in new forms of steel. One result is the development of a new kind of stronger stainless steel.

Nor would it be surprising that the nation's pioneer and leading producer of plastic raw materials would be selling plastic food bags with a new kind of fold-lock top that locks in freshness. They're called "Glad" Bags, and they keep Pat Deegan's lunch fresh even though it was packed the night before.

But you'd have every reason to doubt that two such unlike activities could come from the same company. Provided you didn't know about Union Carbide.

In fact, you'll come across lots of diversifications at Union Carbide. It's one of the world's largest producers of chemicals, and it makes ingredients for textiles, paint, and urethane foam for cushioning. It is one of the most diversified private enterprises in the field of atomic energy. As a world authority in supercold fluids, it produces tons of liquefied hydrogen, oxygen, and nitrogen for fueling space vehicles. It's a leader in carbon products and makes exhaust nozzle liners for rockets, brushes for electric motors, and electrodes for electric arc furnaces. And its consumer products include world-leading "Prestone" anti-freeze.

In fact, few other corporations are so deeply involved in so many different skills and activities that will affect the technical and production capabilities of our next century.

The next century starts with Pat Deegan's lunch.
Coke Refreshes you Best!

BOTTLED UNDER AUTHORITY OF THE COCA-COLA COMPANY BY
THE ATLANTA COCA-COLA BOTTLING COMPANY