APPENDIX B.

HISTORY OF THE GEORGIA TECH PHYSICS DEPARTMENT 1967-1978.

Edward W Thomas

The first Appendix (Appendix A) was completed by David Wyly in 1982. It covered the composition of the School through 1967, the date of its move to the "New" Physics Building. The work was based on his reading of the Ga. Tech Catalog and on his own voluminous memory of events. Basically he wrote notes for each year where there was a significant change in faculty composition or in programs. He also listed all the faculty in such years. (Any year where nothing much happened he left out of his notes!) In preparation for a historical review of later years I started a similar set of year by year notes. It is these notes which are given here, starting from the 1967-68 year and ending in 1977-78. The period covers the period when Jim Stevenson was Director of the School. Jim subsequently wrote a review of his years without any reference to the present notes. The notes are provided here are a supplement to the work of Stevenson for his period.

Wyly had chosen to reproduce the faculty listing from the catalog, year by year, and to comment on the changes which had taken place from the previous publication. Frequently when a new individual has arrived on the faculty then Wyly would, for the year of arrival, write a brief synopsis of that person's career at Tech. I noticed that for some of the faculty arriving in the late 1960s he failed to write these synopses. Probably no slight was intended. Wyly wrote mostly about the people he knew best. He focused on faculty who worked in research areas close to his own and on faculty who had themselves earlier been students in this School. The present writer has taken the opportunity to correct this deficiency. So for the first year of this appendix he has listed all faculty and written career synopses for persons who inexplicably had been ignored by Wyly. He also shows which faculty had been previously covered by Wyly and where to find his comments. Beyond that year the writer has followed Wyly's approach of writing a synopsis of a person's career in the year he (and in later years *she*) arrived.

1967-1968

Edwin D. Harrison. Is President. The Catalog lists Ralph A. Hefner as Dean of the "General College" (The College where Physics is located). However Hefner had passed away the previous July, too late for the Catalog to be changed. Arthur Hansen (who was Dean of Engineering) is the Acting Dean of the General College.

The School of Physics was headed by Vernon Crawford, Director. Vernon had been in that position since 1964. As Associate Director there is Joseph Howey. Joe Howey had been Director of the School from 1936 until Vernon took over in 1964. Howey's principal contribution at this time was to organize and oversee the move into the new Physics Building—a building that he had helped design.

We give below a listing a short synopsis on the faculty present at the start of 1967. In some cases we will refer the reader to notes written by Wyly in his history of earlier years when this person arrived at Tech (given as Appendix A).

Faculty Members

Director: Vernon Crawford. In 1967-68 he is Director of the School of Physics, a position he took in 1964. Discussed by Wyly (Appendix A) under 1949-50. Vernon is unique in the annals of University life in Georgia in that at one time or another he sat in every possible position in the system, either as a permanent appointment or an acting appointment. He started as an Associate Professor of Physics. He headed the Physics division of EES, head of the School of Physics, became Dean, Vice president and then Acting President. Subsequently he took the position of Chancellor and thereby headed up the whole of the University System in Georgia.

Associate Director :Joseph H Howey. In 1967-68 he is Associate Director of the School. For 18 years he was Director of the School and in 1964 drops to the position of Associate Director and devotes his time mainly to facilitating the transfer of the School from the "Old" Physics building to the "New" Physics building. He retires in 1970. He is discussed by Wyly under the year 1936-1937.

Regents Professor: L. David Wyly. In 1967-68 he is a "Regents Professor". The only person of that title in the school. He is discussed in Appendix A under the years 1939-1940 and also 1949-50 in paragraphs written by Professor Braden.

Professors

R Martin (Tino) Ahrens. Born in the USA of German diplomatic parents. The family returned to Germany prior to the Second World War where Tino spent his youth and where he was educated. In August 2008 he published (under the publishing house "AUTHORHOUSE") a book about the first twelve years of his life spent in the USA, and in Germany during and after the war. It is titled "Twelve Years: A Boys Story Told by an Old Man". He arrived in Atlanta to work at Lockheed Marietta on a project to design a Nuclear Powered aircraft. This project did not last long and Tino found a position at Tech starting in the 1965-66 academic year. He is a theoretical physicist with academic interest in neutrinos and specifically neutrino mass. In the 1970s he was involved with a very large experimental project to develop neutrino detectors. The project had federal funding and originally was managed by a commercial company set up for the purpose. Main driving personality of the company was T. P. Lang. The government interest in the detectors was to detect remote nuclear explosions using neutrino signals. The academic interest was to use such detectors to look for neutrino oscillations outside the Savannah River Nuclear Reactors and from that determine whether or not neutrinos had mass. By 1975 the project had been transferred to the support of the NSF and the research itself had moved from the private company to the EES (now GTRI). During the period 1975 to 1982 the project (Then titled "Low Energy Experiment to Measure a Weak Coupling Of the Neutrino Current ") received over one million dollars from the NSF. The project also received significant funding from the Ga. Tech administration since they realized that its

success would bring great reputation to Tech. After 1982 the project was essentially dead. Tino's theoretical research produced a modest flow of rather significant papers. He continued to publish after retirement and in June 2007 published a rather significant book "From Dirac to Neutrino Oscillations" (Published by Springer Verlag).

Tino always kept a strong Germanic accent and had a wry sense of humor. In his early years he had a fairly rapid promotion record. His hiring for the 1965-66 academic year was directly into an Associate Professor position. Two year later he is promoted to Full Professor.

Charles H Braden. Discussed by Wyly (Appendix A) under the year 1951-1952. A man who had a profound impact on the school in its formative years. He collaborated with Wyly in the nuclear spectroscopy group.

Hal Brewer. A theoretical nuclear physicist. His work was largely in support of the experimental group of Wyly and Braden. Discussed by Wyly (Appendix A) under the 1957-58 year.

Walter P Ewalt. Walter was hired in the 1930s when the school had only a teaching functions. He handled the teaching of a large load of introductory Physics courses.

Joseph Ford. In 1966-67 he is studying solid state and condensed matter problems. Later he explores the consequences of non-linear behavior in physical systems from which he develops the subject of "Chaos". In this area he becomes a world recognized leader. He is discussed by Wyly (Appendix A) under the year 1961-62.

Harold A Gersch. A genial New Yorker with an enormous knowledge of all aspects of his subject. He was a theoretician working in Condensed matter Physics and also generally in Statistical Mechanics. He claimed that he had originally intended to be an experimentalist. But he became laid up in bed through sickness for a considerable length of time. Unable to do any work in the laboratory he started to play with theoretical ideas—and never gave it up! He could deliver almost any graduate level course with complete competence and was regarded by students at all levels as a superb and inspirational teacher. He claimed that he would only publish two papers per year. One was in association with his current graduate student and that was designed to highlight the work of the student. The second paper carried only his name and was his own personal research.
Discussed by Wyly (Appendix A) under the year 1953-54.

David W. Martin joined the faculty in 1957. At the start of his career his main function was sponsored research carried out in the Engineering Experiment Station [EES – now known as GTRI].His listing as a faculty member in Physics was something of a courtesy; in the early years he did not have an instructional function in Physics. He came to Tech with Earl McDaniel and together they set up the "Atomic Collisions' Research Group. Until the early 1970s his office was located in the Radio Isotopes Building (now known

as the Emerson Building) which was an EES facility and where the Van der Graaf accelerator was located. Dave worked with McDaniel on the development of equipment to study ion molecule reactions; this was the so-called "Drift Tube" system. The two of them also used the Van der Graaf accelerator (at 1 MeV a fairly low energy machine) to study Ionization, and Charge Transfer between Hydrogen Ions and various gases. Dave was a most methodical and careful scientist and his care for detail was an important factor in the success of the various McDaniel - Martin collaborations. Round about 1969 or 1970 President Hansen decreed that all faculty with joint appointments in academic units and in EES should decide which one they wanted to continue and to move full time to that status. Martin transferred fully to Physics. In the late 1970s support for his research activities declined. Dave left both his projects (although they continued under McDaniel and Thomas), and devoted the rest of his career to teaching.

Earl W. McDaniel joined the faculty in 1957.Just like Dave Martin, and some other faculty, the start of his career was devoted to sponsored research carried out in the Engineering Experiment Station [EES – now known as GTRI].His listing as a faculty member in Physics was something of a courtesy; in the early years he did not have an instructional function in Physics. McDaniel had been a B.S. student at Tech before doing Military Service in the Navy and acquiring a PhD at Michigan. At Tech he developed research projects on Ion Molecule Reactions (with Martin), High Energy Ionization and Charge transfer (with Martin), Electron – Ion Collisions (with Hooper in EE). It is fair to say that he was the driving force at the early stages of all three projects and all three created major national and international reputations. In time he passed two of the projects over to his collaborators and concentrated for the rest of his career on the Ion Molecule Reaction studies. Earl was a prolific writer. He was probably the first member of the faculty to write a book and eventually had written or edited quite a number of volumes. He published an enormous number of research papers. Also, very importantly, he trained a number of really first rate PhDs who later became national leaders. In particular one thinks of Karl Lineberger (Member of the National Academy and one-time Departmental Chair at the University of Colorado, Boulder) and Dan Albritton (who became Director of the NOAA Aeronomy lab). Earl was a keen teacher of upper level courses. He felt that the best way of learning something was to give the course in that subject. And he really wanted to learn everything that he could master. Earl was also known to attend classes given by his colleagues.

Earl had been an undergraduate at Tech and in that time developed the reputation as a bit of a "hell-raiser"; a reputation of which he was very proud! Perhaps because of this reputation the School of Physics originally had a real reluctance to give him faculty responsibilities. His original hiring was into EES with a courtesy title (and no responsibilities!) in Physics. Anxious to participate in Academic life Earl managed to get himself hired as an Associate Professor in the Electrical Engineering School and he taught in that School for some years. When Vernon Crawford became Director of Physics the opposition to having Earl join the school mellowed a little and he moved his Academic affiliation to Physics and dropped his EE connections. By 1964 his research activities and office were physically located in Physics although the funding for his research was still administered through EES.

Earl's wife was Frances, and he met her through the service station her father operated at the corner of Spring Street and North Avenue. (In 2008 it is still there as a convenience store gas station). Earl and Frances were enormously hospitable people and made great efforts to welcome new faculty and students to Tech and to Georgia. Their home was always open and they gave many formal dinner parties. Earl made a great effort to have his students attend International Conferences and to get experience in their profession.

Edward T. Prosser, A full time teacher.

Edwin J Scheibner was first listed in the faculty in 1965. He has left a position at Bell Telephone, New Jersey, and taken a Research position in EES. His listing in the faculty of Physics was something of a courtesy. His main function in EES was sponsored research. In later years he also was leader of the group where all Physics research in EES was located. Apart from a few specialized courses related to his research area he never taught in the School, nor did he maintain a lab or office in the school. His interest was Auger Spectroscopy and in that he was something of a world leader. He collaborated enthusiastically with faculty members interested in solid state problems and graduated a few PhDs in the school.

Thomas L. Weatherly, Tom Weatherly worked together with J Q Williams in developing a Microwave Spectroscopy Research Group. Tom was the theoretician and J Q the experimentalist. This group, with the Nuclear Spectroscopy group of Wyly and Braden, was responsible for most of the PhD graduates in the first ten years of the program. There were many people with Microwave skills working on the campus in EES. Some of these wished to acquire an M.S. or PhD. Degree. They came to Weatherly and Williams on a part time basis to perform their research. Some of the graduates of this program were the founders of "Scientific Atlanta" (recently bought by Cisco Systems). Tom Weatherly died in 1982 while still employed at Tech. Over the years this is the only case the author can remember of a member of the school passing away prior to their retirement. Wyly (Appendix A) discusses Tom Weatherly under the year1951-52

Michael Wilkinson remained listed in the school's faculty roster for many years although in fact he was on the campus only for approximately 12 months as a visiting faculty member. His position was in the Solid State Division at ORNL and eventually he headed that Division. He should probably have been more accurately listed as an "Adjunct" member of the faculty at Georgia Tech. Nevertheless his name added luster to the school's personnel and it was repeatedly listed on the roster even though he had not set foot in the school for years!! Mike continued close intellectual connections with a number of faculty and was very helpful in arranging for students to go to ORNL for research experience or to take up Fellowships.

J Quitman Williams. Worked in concert with Tom Weatherly in creating the Microwave Spectroscopy group. J Q was the experimentalist in the partnership. J Q married a Ga. Tec. Librarian. In those days it was the law that two married persons could not both work

at the same state facility. One of them had to go and Ethel became a high school librarian instead. J Q and his wife started the very popular School Lobster Picnics held each Fall. These originally were held in J Qs back yard! Wyly (Appendix A) discusses JQ under the year 1951-52.

Robert A. Young. Listed in the faculty first in 1964. Yet another person who was in practice an employee of EES but who was given a courtesy listing in Physics. Ray's research used X-Ray Crystallography and much of his reputation was related to his work on apatites. One natural form of these structures is Talc. This mineral is (or was) extensively mined in Central Georgia. Another form is tooth enamel; study of Fluoride incorporation into tooth enamel provided much of Ray's funding for many years. Ray was provided custom designed space for his research in the "New" Physics building. He even arranged to have the office space designed to accommodate a secretary. When the "New" building was occupied he moved some of his equipment and activities from EES to the new space. But it took some time for him to physically move himself and his personnel to Physics. In about 1982 he made the final change.

Ray was very successful on a national and international basis. He brought the Editorship of a journal to the School of Physics at Tech; this was the first major journal edited from this school. He was elected president of the American Crystallographic Association and sat on a number of International Committees. For decades he gave a short course in X-Ray analysis which attracted large numbers of paying customers. He also maintained very extensive international connections and traveled widely.

Associate Professors

Ian R. Gatland arrived in 1964. He was British, trained at Imperial College London, and came to Tech after brief positions in Geneva and Johns Hopkins. He was hired with the intent that he, and others, develop research programs in theoretical nuclear physics. In practice this proved not to be fruitful at Tech. Ian also had great expertise as a Computational Physicist and soon he was drawn in to the projects of Earl McDaniel to provide the computational skills to unravel the details of the Ion Molecule Reactions occurring in McDaniel's drift tube experiments. This led to a very fruitful collaboration. Ian developed a number of courses which either taught computational physics or which were based on the use of computers. For a very long period of time he served as the Assistant Chair of the School taking responsibility for all undergraduate matters.

Don Harmer. Don was a nuclear physicist by training. He was hired at tech into the "Nuclear Sciences Division of EES". Like so many other EES persons he was given a courtesy listing in the School's faculty roster although in his early days he had no activities within the school. For a while he was an active collaborator with McDaniel and Martin on their High Energy Atomic Collision Research Activities. He also worked for many years on a very large project to detect neutrinos which was the brain child of Tino Ahrens of Physics (and of some other persons in an off-campus company). He was an instrumentation man and a leading expert on the use of early laboratory computers

(PDP8s) for the control of experiments and the analysis of experimental data. When the School of Nuclear Engineering was created out of the EES facility Don joined that school although once again he kept his courtesy listing in Physics. Towards the end of his career the School of NE declined in significance (and became part of M E) and Don moved his activities entirely to Physics as a full time teacher. His courses included a large amount of work on small computers and also a course on "Nuclear Astrophysics".

Eugene T. Patronis Jr, Gene was a PhD student in the group of Wyly and Braden. After a brief Post Doctoral position at Brookhaven he returned to Tech to become a faculty member and to work further in the group of Wyly and Braden. Patronis' skills were in electronics. With Kendrick he developed the techniques for interfacing small laboratory computers (PDP-8 computers made by DEC) to control equipment and to collect data. The nuclear spectroscopy research facilities became highly automated as a result of their work. This effort was also the basis of a number of courses on instrumentation that proved very popular parts of our program in the 1980s. Gene always had a hobby interest in the procession of sound. As the nuclear research program wound down Gene started activities related to sound reproduction. He used the small computer expertise for the manipulation of sound and for alleviating delays and echo in reproducing sound in large spaces. He designed the sound system at the Atlanta Civic Center and also in some rooms of the White House in Washington. He designed and maintained all sound systems on the campus including that at Grant Field, the Coliseum and the Ferst Center. For this he was paid by the Institution. Gene was the only Physics faculty person to receive part of his annual income from the Physical Plant Department – an organization we normally associate with Janitors and Maintenance personnel. Much of Gene's work on sound systems was carried out as a consultant and separate from his faculty responsibilities. Wyly (Appendix A) discussed Patronis under the year 1955-56.

Augustus L. Stanford,
"Gus" Stanford was an undergraduate at Tech and returned to become a faculty member. His original research area was in the experimental study of dielectric properties of materials. A student once asked him why he had chosen that field to study at Tech. Gus replied that when he returned in 1963, he anticipated having virtually no money to buy equipment and that in any case there would be no lab space and he would need to do all the research in the corner of his office. He focused on a rather cheap and simple set of equipment that would fit on a shelf. It must be admitted that the research into dielectric properties was never a roaring success.
Gus later became interested in whether human (and animal) memory was basically electrostatic or magnetic in origin. He conceived of biological experiments to test this. One experiment was to put his own head between the poles of a large electromagnet and oscillate the field to see whether this scrambled his memory. A positive result would have demonstrated a magnetic origin to memory. Needless to say the experiment proved nothing (although Gus did claim to experience the sensation of flashes of light!). He subsequently designed experiments involving rats. The animals were trained to do something (e.g. turn left at a red light). Then they were sacrificed (i.e. killed) their brains

extracted and mixed together in a kitchen blender. Some samples were then subjected to oscillating magnetic field to destroy magnetic memory, some were subject to oscillating electric fields to destroy electrostatic memory and some samples of blended brains were not further treated at all. The various brain samples were then injected into new rats and the rats tested to see whether they had acquired any of the "memory" of the original victims. Obviously the hope was that one kind of brain scrambling would destroy memory and thereby prove very clearly the nature of memory (at least in rats). Sadly none of the new rats seem to have any knowledge at all of what to do at red lights. The project elicited much outside interest and some significant early financial support. Everybody wanted to look at the rats and the whole premise of the project was so simple that "the man in the street" and even our higher administration, could understand it. Many rats were sacrificed. Quite a number escaped and ran around the ground floor of the "New" Physics building. This led to a rather malodorous situation.
Following the rats Gus moved to writing. With Jim Tanner he wrote a Sophomore Physics text, Regrettably this was not a great success. He then moved to creating the script for the new Fernbank Science Center Permanent Exhibit area. This was an enduring success and remains in use today.
Stanford is also discussed by Wyly (in Appendix A) under the year 1964-65

James R. Stevenson,
In the year 67-68 Jim is our sole experimentalist working on Solid State physics with a particular interest in the Optical properties of solids. Jim realized that Tech, and in particular himself, needed contacts with other organizations. So he spent many of this summers working at place such as the Naval Research Laboratory. He was forever making contacts on behalf of the school. Eventually his contribution was recognized by his elevation to the Directorship of the School. Subsequently he held other high positions at Tech including "Executive Assistant to the President' for many years. When he became Director of the School Jim decided he needed to live closer to Tech (he had previously lived in Smyrna) and he bought a mansion in Ansley Forest from a member of the Rich's department store family. This was an absolutely huge space which required enormous effort to maintain. University faculty do not earn enough to maintain mansions – and Jim ended up doing much of the work himself. The house was, however, a wonderful space. He made a practice of holding receptions and faculty gatherings in his huge rooms. Jim loved to travel and was one of the first faculty to create for himself "Sabbatical " period abroad. He worked at DESY in Hamburg and then, for a complete change of pace, in northern Ghana for a year.

Oscar B Wike, Hired only to teach. Discussed by Wyly (Appendix A) under years 1946-47

LeRoy Woodward was hired into physics in 1962. He had a unique relationship with the school in that he had been the second of its graduates in the B.S. program. After graduation he had performed wartime service on aircraft carriers, acquired an M.S. degree at Michigan and returned to Atlanta with his southern wife where he became Director of Research for Scripto Engineering (This company at one time dominated the

US market for ball point pens, cigarette lighters and other small domestic items). He then moved to EES where he set up the Microscopy facilities and then to Physics where he became a full time teacher. He was a major contributor to the creation of our early Optics educational programs. LeRoy was a firm believer in the Tech education experience and he sent his son George to Tech from which George graduated with one of the first "Applied Physics" degrees. George became a major force in the railroad industry and was at one time CEO of CONRAIL. LeRoy was strongly connected to the Greek Church in Atlanta and was for many years treasurer of the Greek Orthodox Cathedral. A strange position for a New England Presbyterian!

Assistant Professors.

H Griffin Carmichael. One of the full time teachers in the school. Eventually left and worked with a local company owned by his family and which installed large tiled areas.

Harry G. Dulaney, Harry was one of the first students in the nuclear spectroscopy group of Wyly and Braden. While working on his Ph.D. he took the professional title of "Instructor" and supervised a large part of the instructional sophomore lab course work. After his graduation he was given the title of Assistant Professor and continued to carry out the same duties as when he was a graduate student. Later in his career he was heavily involved with the technique of "Self Paced Instruction" which was brought to Tech by Jim Tanner. Eventually Dulaney took over this whole program from Tanner. Harry retired from Tech at the earliest opportunity.

Nisbet S. Kendrick, Nisbet joined to nuclear spectroscopy research group as a PhD student. At the same time he supervised instructional labs and took the professional title of Instructor. Nisbet did not actually acquire a PhD. But he continued in the instructional role and continued to work with the Nuclear Spectroscopy group. By 1966-67 has the rank of Assistant Professor. Nisbet was an absolutely superb electronic engineer. He handled all the instrumentation of the nuclear spectroscopy group. In particular he was one of the first people at Tech to introduce small computers into the research laboratory for instrument control and data acquisition purposes. He developed courses on instrumentation and electronics. Eventually he left Tech to take up a far more lucrative position with an Atlanta computer hardware company.

Don Forester. Don was hired in 1966 to start a program in "Low Temperature Physics". This was to be housed in our brand new building. To do the work Forester wanted to perform it was necessary to build a considerable amount of equipment. While some funds were available they were not lavish. More of a problem was that there were no adequate technical support facilities in the school. The project became bogged down in a building program. This was a frequent difficulty for experimental research projects started in the 1960s through 1980s. Eventually the progress ground to a halt and after a few years

Forester left to join the Naval Research Laboratory where he had a rather successful career.

Martin R (Ray) Flannery, hired as an Assistant Professor. The "Atomic Collisions" group had long wished to have a theoretical component to their research. Ray Flannery was from Northern Ireland and had received his PhD under David Bates at Queen's University. He then came to the USA for a post –doctoral position in Boulder while his fiancée left Northern Ireland for a one year appointment in Canada. We persuaded Ray to take the Assistant Professor position at Tech and he and his wife duly arrived. But there were others who wished to have Ray's services and during this year he received an offer from the Smithsonian Institution in Harvard to work with Alec Dalgarno, a former faculty member in Queen's Belfast. Ray could not turn him down and left Tech at the end of the 1967-68 year. The Atomic Collisions group kept in contact with Ray and a couple of years later we persuaded him to once again take a position at Tech. And this time he stayed permanently.

Edward Thomas. Ed Thomas was a graduate of University College London and arrived in 1964 to join the Atomic Collision activities of Martin and McDaniel. He was originally employed entirely in EES. In 1965 he was given a courtesy listing in Physics and started part time teaching in the school. He took over responsibility for the "High Energy" part of the Atomic Collisions research activity and operated the Van der Graaf Accelerator in Radioisotopes Building (now Emerson) for many years. He also built a low energy accelerator in Physics and later was provided in with yet a third accelerator based on a commercial ion implantation system. His research was devoted to collisional excitation including inner shell processes and collisions on surface. Ed was Director of Physics (now titled Chair of the School of Physics) from 1982 to 1991. He subsequently became "Secretary of the Faculty " (A position in the faculty governance of the Institution) and after retirement in 2002 took a part time position as the Institution's "Faculty Ombudsman".

William E. Woolf. Bill Woolf worked first briefly for EES and then was hired into the School of Physics to teach. He devoted his time almost entirely to introductory sophomore classes. Bill was a really superb teacher for this type of course and students fought to get into his class sections. He had an ability to explain things clearly and cleanly. He held the attention of students at all times and they were never given the chance for their attention to wander. Above all he made sure that students were prepared to pass the course. Bill was really happiest when teaching a sophomore class to a small number of students. He disliked being made to teach very large groups of students in our large lecture rooms. He disliked decisions on texts and syllabus content for his course to be made by committees. Overall he became quite disgruntled with the schools programs and took a retirement at the earliest opportunity.

Support Staff
The two secretaries were important and valued members of the School. Ruby Palmer had joined the school in 1960, became Ruby Mainor by the 1964-65 year. Some years later she resigned to devote herself to her family. She then returned to Tech as Secretary to the Dean and married Ray Borkman a Faculty member in Chemistry. Ruby performed all the large scale typing projects for the school. Reports, proposals etc. Her accuracy and speed were excellent. Anna Ruth Hale joined us in 1964 and remained with the school until retirement almost 40 years later. Originally she was to perform minor typing and front office duties. But in time she came to operate the school's purchasing program, hourly payroll and graduate recruitment programs; this all in addition to being the Chairperson's personal secretary and doorkeeper. She performed all these tasks with calm efficiency. She was notable in that she pretty much refused to employ enhanced office machinery. Her IBM Selectric Typewriter and handy adding machine was all she needed. When one looks today at the larger number of people that we must now employ to carry out the functions that she as one person discharged – we can only marvel at her efficiency.

Programs.
Over a period of years Physics attempts to market itself as a program where students with interdisciplinary interests might perform their first degrees. There are a variety of justifications for this. Firstly it is quite obvious that our undergraduate students go off to a variety of professions and graduate schools which are not Physics related. For example a fair number become MDs. This is a trend which is certainly true at Tech and is later recognized on a national scale. By contrast graduates of Chemistry and Biology programs tend to find careers in those subjects. So for a Physics program there is perhaps some benefit to promoting the idea of using the subject as a preliminary degree for some other profession. This becomes obvious for the first time in the catalog for this year which includes the phrase "An undergraduate program with an emphasis on Geophysics can be worked out within the Physics Curriculum by proper assignment of elective courses". The Physics program did in fact have 46 free elective hours in the Junior and Senior years (almost half the total hours for those two years), the largest block of free electives in any program at Tech. Promotion of the Geophysics "track" was probably because Tech had a School of Geophysics but that school declined to create a B.S. program and was entirely a graduate program. There was a shared hope that the School of Physics would feed the Geophysics graduate program. We shall see that in later years more and more such "options" or "tracks" were advertised in the Physics curriculum.

The catalog shows the school offering degrees of

Bachelor of Science
Master of Science
Master of Science in Nuclear Science
Doctor of Philosophy.

The PhD has been listed for the first time in the 1955-56 catalog. At that time there were only four other schools offering that degree (Chemistry, Chemical Engineering and Electrical Engineering). It is interesting to note that at this point the degree had a language requirement.

The catalog did not list any specific requirements for the Master of Science in Nuclear Science nor how it was different from the Master of Science in Physics degree. The writer (EWT) does not recall any programs related specifically to the Nuclear Science Degree nor any activities related to the degree. It had been in the catalog since at least 1963-64. In the 1971-72 catalog that degree disappears and is not ever resurrected.

Graduate Programs are not covered in the Student "Catalog". Rather they are described in a separate publication called "The Graduate Bulletin". This Bulleting also lists the faculty who contribute to the "Graduate" program. In practice the "Graduate Faculty" are all those faculty with PhDs, whether or not they are actually engaged in research or in graduate education. Faculty with only lower degrees are not listed in the "Graduate Bulletin".

1968-69

Edwin D. Harrison. Is President. Arthur Hansen is still listed as Dean of the General College.

Ed Prosser, one of our full time teachers retires and is listed as "Emeritus". The faculty gains four more people in Professorial Rank.

Jim Tanner, Hired as an Associate Professor. Jim had been a student at Tech and received his PhD working for Gersch. He then left and worked in a faculty position in South Carolina. Jim's great interest was in teaching and in instructional techniques. The school realized that the teaching of large numbers of students in 150 to 200 person lecture theaters was an instructional challenge that needed some dedicated attention. So it was determined to hire Jim back to Tech as a faculty member and with the specific role of spearheading instructional technique development with a particular emphasis on the large sophomore classes which are taught to Engineers. Jim returns to Tech this year into this position. As planned he devises many innovative instructional techniques. He introduced the technique of "Self-Paced Instruction" which was getting considerable attention in Physics programs. In this a student is provided with a set of instructional materials which they study at their own pace and then return, when they feel ready, to be tested on their competence. If they "pass" this test (called a "gate") they can start the next module of the course. There are a total of about 13 modules covering each of the three (quarter based) sophomore courses. The number of modules successfully completed in the quarter determines your grade There is the very important criterion that a student does not progress until he or she has mastered the module in hand. Fail the gate and you go back and do it again. . The technique involves no formal classes. But it does require that the course supervisor create testing materials for each module each day of the quarter, just in case somebody decides they need to be tested. The program actually worked very well. When benchmarked again a conventional lecture based course the students in the self-paced program "retained" 30% more material than in a conventional lecture course. (a result also found in other institutions). Regrettably other faculty were not interested in

joining Jim in this endeavor. Standing in front of a class is, apparently, a major incentive to being a faculty member. Only Harry Dulaney worked with Jim although some non-Professorial assistance was also provided at various times. After some years Jim got tired of it and the program terminated after Harry Dulaney retired.
Jim decided that conventional sophomore texts were too long and not really suited for Engineering Majors. In co-operation with Gus Standford he writes a complete sophomore level text. The text was used for a few years at Tech (early 1980s) and at a few other schools. Regrettably the text is not well received by other faculty and eventually is abandoned. It is no longer in print.
In 1982 Jim takes responsibility for managing the whole of the sophomore program. He created detailed syllabi, and takes the responsibility for creating all testing materials for the courses and for grading the tests! Faculty tended to lack enthusiasm for the central planning of the program. But they really liked the idea that all testing would be handled by somebody else. So this program received grudging acceptance and any talk about terminating it would result in great faculty displeasure. The program of centralized testing continues to the present day.
Jim is an affable pleasant guy who had the ability to work with anybody in the school. For a period of time he was appointed Assistant Director for undergraduate programs.

Helmut Biritiz, Hired as an Assistant Professor. Helmut was hired directly from Austria where he had finished his PhD. Tino Ahrens had good connections in Germany and was responsible for the recruitment. Helmut was a theoretical Physicist with particular interests in subjects like Relativity. These are areas where it is very difficult to make substantial new contributions. Thus his publication rate, and the numbers of Ph D students, were somewhat lower than that of other faculty. But he was skilled in an area that students wanted to understand and expected to find covered in a School of Physics. His contribution was a very important contrast to the more applied Atomic, Molecular, and Solid State Physics that was the mainstay of the school. He is a very meticulous individual and very effective in organizational matters.

Charles Frahm, hired as an Assistant Professor. Frahm had received his PhD in the School in 1967. Some faculty felt that he had great prospects and that the School should continue to assist him in his career. Faculty members organized a one year "Post-Doctoral" position for him in Israel. Even lending him money for the fare I believe. And on his return they committed the school to providing him with a brief faculty appointment while he sought a permanent position. This is the year he arrived for the on year position. At the end of the year he left Tech.

Administrative Assistant. For the first time the school hires a professional administrative assistant. This is Dan Tomasulo. The position takes care of the administration of grants and contracts and management of the School's Institutional budgets. The position oversees purchasing and record keeping although in practice most of that work is carried out by Ms. Hale the Director's Secretary.

. 1969-70

For this present year it had been intended that Vernon Crawford should be Dean of the General College. And indeed he started the year in this position. But Edwin Harrison resigned as President. Vernon was catapulted into the position as Acting President to replace him. So from Director of the School to President via Dean in a matter of six months. Vernon retains the title of Dean of the General College. Jim Stevenson takes over from Vernon the position of Director of the School. Howey remains as Associate Director of the School.

H Griffin Carmichael resigned from the school. Griffin had an M.S. degree from Emory and was employed as one of our "full time teachers. His work was confined to the lower level courses. This he did not find very stimulating and he left Tech to join a local company run by his family. The company made custom tiles for large areas. Mr Carmichael took on the task of planning the shape and distribution of tiles for these large areas.

Don Forester left Tech to take up a position at the Naval Research Labs. He was essentially replaced by Roger Little who took over Don's low temperature facilities and was expected to become the school's expert in that area. Roger suffered from inadequate start-up funding. Once again it was realized that groups competitive in this area had large amounts of money and many skilled technical support personnel. Even the supply of liquid Helium was a problem – it had to be trucked from Huntsville. Roger's research was not a great success and did not bring the recognition that the school had anticipated. Roger eventually left Tech to go work as an analyst for a major Insurance Company. On leaving Tech he married and took with him the School's junior typist!

When Vernon Crawford left the School to become Dean he took with him as Administrative Assistant Dan Tomasulo who had been the Administrative Assistant in Physics. To replace Dan we hired Jon Barbour who remained with the school until about 1990 when he also became administrative assistant to the Dean. Jon was a quiet competent individual who became the major support function of the school. He dealt with all the budgets. He assisted faculty with the "boiler plate" of their proposals contributing their budgets and administrative details. He checked each proposal as it went out. For many years he prepared all hiring and promotion packages. He introduced computers into the administrative offices, word processing for the secretaries and spreadsheets for himself and the book-keeper. He hired people and if necessary fired them. And if the roof leaked—he would be up there in the rain with a caulk gun fixing it. Jon did everything that needed to be done. He was universally admired and respected. He was on nobody's blacklist. In his private life Jon was an accomplished professional grower of narcissi.

1970-71

Arthur Hansen is President. Vernon Crawford has left the Dean's office and is the Vice President for Academic Affairs. Bill Eberhart is acting Dean of the General College. Bill was a member of our own School of Chemistry.

The School has hired David Kennedy to provide a theoretical activity in the Atomic Physics program. David is a graduate of Queen's University in Belfast. David and his wife never really took to Atlanta and within two years left to take up a position in Northern Ireland.

1971-1972

The senior administration remains unchanged. Arthur Hansen is President, Vernon Crawford (of Physics) is Vice President. William (Bill) Eberhart (of Chemistry) is Acting Dean of the General College. Stevenson is Director of the School.

The School hired two new faculty who are to make an extended contribution to the development of the school's reputation. Don O'Shea and Ron Fox. Leading members of the School (notably Stevenson and Gersch) had long identified certain specific areas of Physics for expansion. The areas were chosen with the potential to have long term importance and to make significant contributions to the subject. One of these areas fell under the general term of "Biophysics". Don and Ron were both hired to contribute to this new "thrust". In practice both had rather broad interests and their long term contributions ranged over a wide area. Realistically they did not, in the short term, greatly advance our reputation in Biophysics. But their overall impact was substantial.

Don O'Shea was an expert in Optical Physics and the Physics of Optical systems. We expected that he would use laser systems to probe biological processes. But his interest turned out to be more related to the lasers themselves and their optics. He joined us at a time when optical communications, optical readers, optical signal processing, were all becoming very important. Don recognized that "Optics" provided a great opportunity for both himself and for students of the school. Over the years he developed a major educational program in "Applied Optics" which attracted great interest from potential employers. The programs were really very "Applied". Don always emphasized the laboratory experience. At one point the students were involved with lens grinding and testing. Don made a point of using up to date laboratory equipment which he persuaded industry to donate to the school. Students in the program were eagerly recruited by employers because they knew how to handle real problems. Don persuaded Industry (Notably Kodak) to grant a number of Fellowships to the School. Don wrote a number of text books in the field. He collaborated effectively with faculty in EE who were at the same time also developing an "Optics" program.

Ron Fox was a BS Graduate of Reed College and received a PhD from Rockefeller University. He joined us from a Post-doctoral position at Berkley. Ron is a theoretician and was originally expected to make a major contribution to the development of a

Biophysics program. He was already active in this area and shortly after arrival published a very well received book on the subject; “The Uroborus”. It turned out that Ron is a man of many interests and well qualified to turn his attention to a variety of areas in Physics. He published on a wide variety of subject generally related to Statistical Mechanics. In later years he collaborated with Raj Roy on studies of Laser noise. He also publishes extensively in the area of Non-Linear Mechanics.

In this year the catalog indicates that the school offers a Masters Degree in “Applied Physics”. The standard Masters degree in Physics was required only the performance of a certain number of graduate level courses. Mostly the degree was taken as a stepping stone to the PhD; after a certain number of hours of Graduate Credit you applied for the MSc. Only on very rare occasions would a student take the option of carrying out an MS these project. Most students who left Tech only with the MS degree were in fact PhD candidates who had failed. Many faculty felt that there was a need for a Masters degree which had a specific purpose and identity. The “Masters Degree in Applied Physics”, or MSAP, was designed as a “terminal” degree. The degree was to be focused on one of a small number of “Applied Physics” areas. Initially we specified Optics, Acoustics, or Computer Interfacing. The student was required to undertake a significant research or development project in the area of interest and write a report on the work. We always hoped that some reports would become publications or parts of publications. The student also undertook a few basic Physics courses at the Graduate level and then some courses specific to the area in which they were specializing. The whole program was designed to be completed in four quarters. In general the School did not anticipate granting any sort of financial support for students in the program so that the students would be “paying their own way”. The program turned out to be very successful. Many BS graduate were anxious for a little extra material to make them more attractive to employers. Some industries sponsored their employees to undertake the program. We also received a number of students from the Military who were able to take a one year educational break from active service.

1972-73

The Catalog for the year no longer indicates that the School offers an MS in Nuclear Science. It is not clear why this degree disappears (or indeed why it was in the School at all).

1975-1976

In this year we note that the Vice President for Academic Affairs is Vernon Crawford, a Physics faculty member and former head of the School. Vice President for Research is Tom Stelson and man who ruled the research programs for many years. Tom was undoubtedly responsible for successful and explosive growth of research at Tech, and of the reputation which comes with it. The catalog listings no longer lists non-academic members of staff like the Secretaries!!

Written in 2009