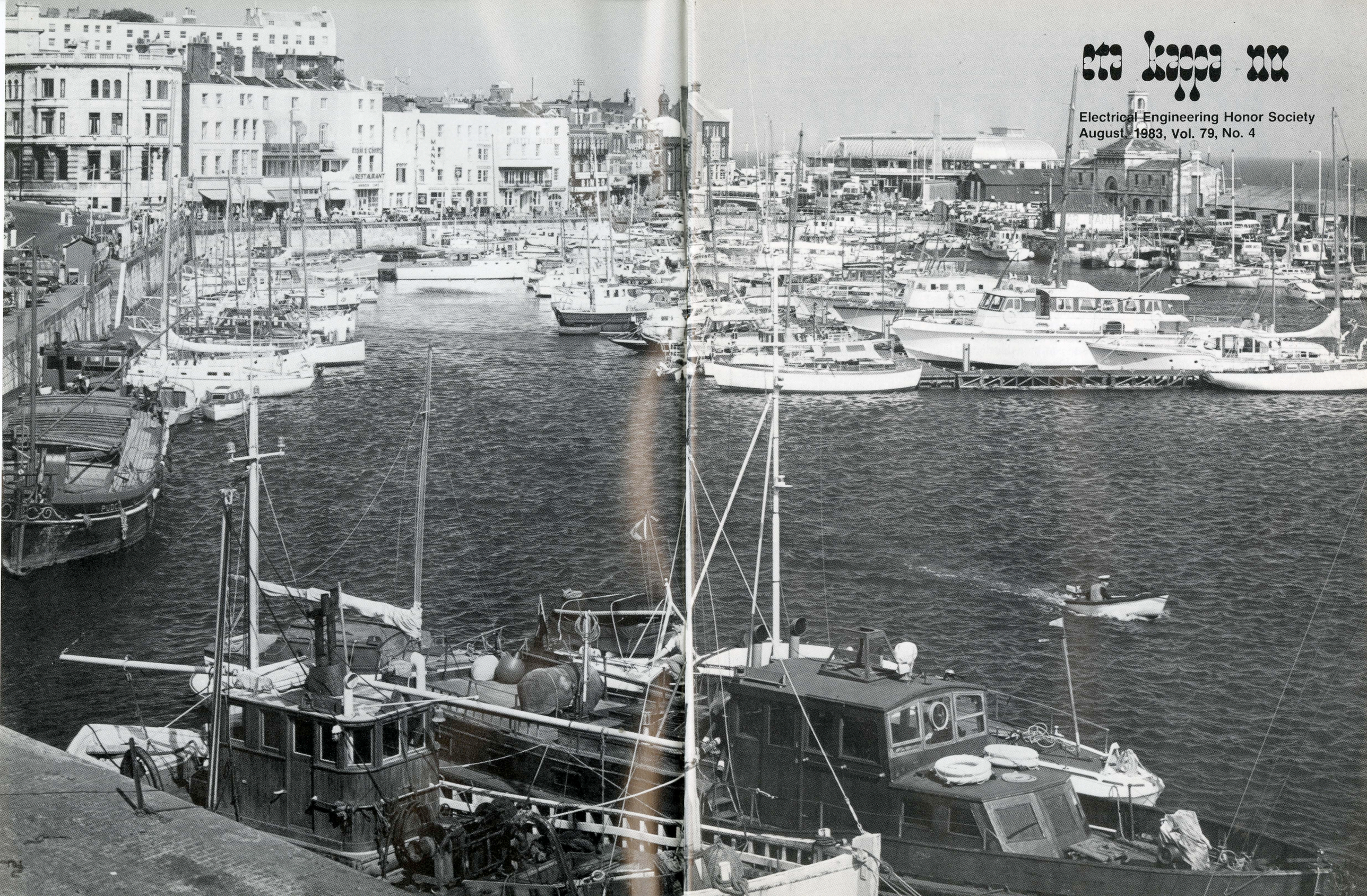

THE BRIDGE OF ETA KAPPA
47626

eta kappa nu

Electrical Engineering Honor Society
August, 1983, Vol. 79, No. 4



Editor and Business Manager
Paul K. Hudson

Contributing Editors

Marc Dodson
Larry Dwon
Lawrence Hamilton
Colleen Hamilton
Alan Lefkow
Marcia Peterman
George Swenson

Photography Editor

Howard Sheppard

The BRIDGE is published by the Eta Kappa Nu Association, an electrical engineering honor society. Eta Kappa Nu was founded at the University of Illinois, Urbana, October 28, 1904, that those in the profession of electrical engineering, who, by their attainments in college or in practice, have manifested a deep interest and marked ability in their chosen life work, may be brought into closer union so as to foster a spirit of liberal culture in the engineering colleges and to mark in an outstanding manner those who, as students in electrical engineering, have conferred honor on their Alma Maters by distinguished scholarship activities, leadership and exemplary character and to help these students progress by association with alumni who have attained prominence.

The BRIDGE is published four times annually — November, February, May, August — and is published by Eta Kappa Nu, Haywood Printing Company, 5th & Ferry Sts., Lafayette, Indiana. Second class postage paid at Champaign, Illinois and additional mailing office. Eta Kappa Nu Association. Subscription price: three years, $7.50; Life Subscription, $30.

Address editorial and subscription correspondence and changes of address to: BRIDGE of Eta Kappa Nu, P.O. Box 2203, Station A. Champaign, Illinois 61820.

With a near-perfect GPA of 2.99 of 3.0 and first in his graduating class of '79EEs at the University of Alabama, President of the IEEE Computer Society, Vice-President of Eta Kappa Nu, Secretary of IEEE, Solo Trumpeter for the University Jazz Ensemble, hardware builder and software writer and a member of the class of '82, was awarded the Alton B. Zerby Outstanding Electrical Engineering Student Award for 1982.

Richard Lee Goodson received the award at the banquet following the reception in his honor at the Disneyland Hotel in Anaheim, CA, on July 31, 1982. Mr. Goodson, in his acceptance told the audience of HKN International Board members, Los Angeles Alumni members, and family and friends that he plans to continue developing computer aids to communication for handicapped in conjunction with his bride's work. With his technical background and her specialized training he said, "We plan to go into business together, or at the very least, work together, making and adapting devices to aid the handicapped."

Also receiving awards of "Honorable Mention," but not present, were Janet Marie Carnett of California State Polytechnic University at Pomona, James Kenneth Haberstock of the University of Missouri at Rolla, Jerrell Paul Hein of Pennsylvania State University, Gregory Steven Parets of the University of New Mexico and William Paul Risk, III, of Arizona State University.

John William Bradbury, Texas A & M University, David Robert Clark, Cornell University, Robert Gregg Majure, Tennessee Technological University and Richard Duane Morris, University of Utah, not present, rounded out the ten finalists.

Mr. Goodson received an expense-paid trip to Anaheim, CA to receive the award at the Disneyland Hotel. The travel funds are supplied by the A. B. Zerby Memorial Trust established by past HKN board members to honor him for his leadership and dedication to the students and members of HKN. A cash gift of $500 is presented to the winner from the Carl T. Koerner Memorial Trust established by Carl's widow, Edith, with the help of his friends. Mrs. Koerner presented the check to Mr. Goodson in person.

James P. Kabel, LA Alumni Chapter president and Em-Cee for the evening introduced Martin Jay MacDonald, consulting engineer to

IDENTIFICATION

Left, Award Winner Richard Goodson is presented the Winner's Plaque by his new bride.

Right, Executive Secretary Paul Hudson greets Edith Ann Koerner. Mrs. Koerner established the Carl T. Koerner Memorial Trust to assist the Student Award Program.

Far Right, President Robert Betten, Mr. and Mrs. Goodson, and Junior Past-President Russell Lueg.

California.....

AWARD DINNER

Text By
Marcus Dodson

Photos By
Colleen and Larry Hamilton

Rockwell International, prime contractor for the space shuttle. He showed some slides and described some of the problems and their solutions in the development of the ship. He followed that with a filmed interview of the astronauts on their return. The interview was interspersed with in-flight film clips, including some comical situations associated with weightlessness.

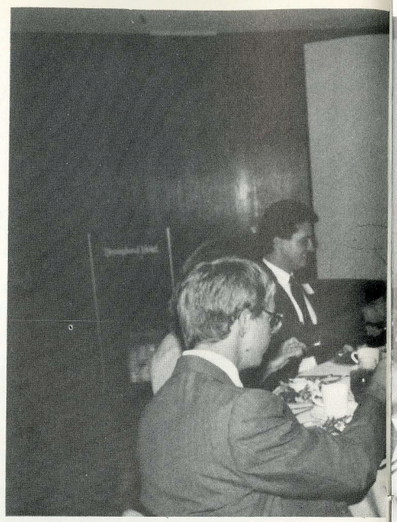
Larry Hamilton, chairman of the Student Award Committee told of the operations of his committee and the process of selecting the ten finalists in the competition. He introduced committee members Rupert Bayley, Marcus D. Dodson, James P. Kabel, William Murray and William T. Stoll.

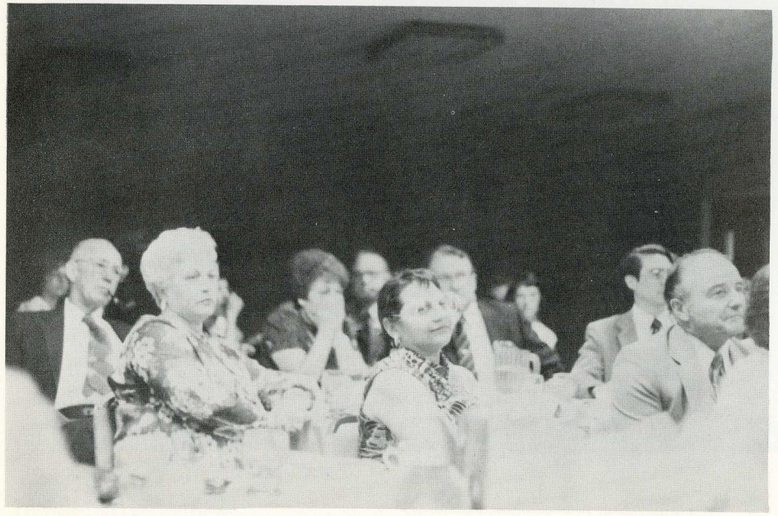
The Alton B. Zerby Outstanding Electrical Engineering Student Award Competition is conducted annually by the LA Alumni Chapter at the direction of the International Board. The committee solicits nomination from all student chapters and screens the nominees to ten candidates, the criteria is based on GPA, service to the school, students, community and contributions to the art of engineering. These dossiers are forwarded to a Jury of Award, composed of outstanding engineers from academe and industry, for individual ranking. The committee then compiles the ranking and arranged for the reception and award banquet to coincide with the board meeting of the International Officers.

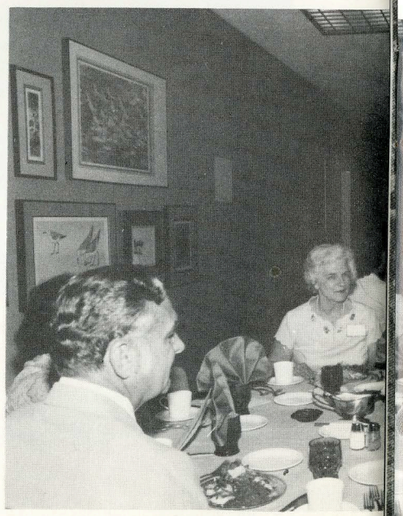
The members of the 1982 Jury of Award were S. Howard Gold, Fellow IEEE, Andrew S. Grove, Fellow IEEE, Stephen J. Kahne, Fellow IEEE, Russel E. Lueg, President HKN, and Berthold Sheffield, Publicity, HKN.

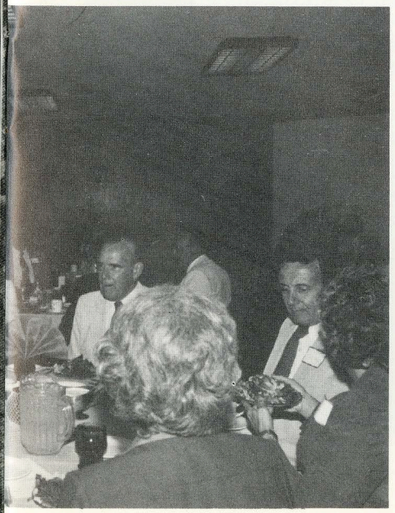
J. Robert Betten, President, gave the qualifications and credits of the winner but deferred to Mr. Goodson's bride to make the presentation of the plaque and certificate.

Paul K. Hudson, Executive Secretary had the last words to wrap up the celebration and he left us laughing.









ELECTRONICS (AND THE DANCE) IN

CHINA

by
ALEX L. CULLEN
University College London

Introduction

My wife and I visited China in May/June 1981 as a result of an invitation from the Northwestern Polytechnical University in Xian through the initiative of Professor Chen Guo-rui, who had spent a few months with me at Sheffield University just before the cultural revolution began. He wrote inviting me to spend 3 weeks in the Department of Avionics in the University and to spend also 1 week each in Peking (Beijing) and Shanghai. All expenses would be met for my wife and myself whilst we were in China.

I was to give a course of lectures on electromagnetic surface waves in Xian with a few additional lectures on other topics.

Having read the accounts sent to me by the Royal Society by earlier visitors to China I realized that my wife would certainly be asked to help in some way, if only in English conversation practice. She is a dance teacher specializing in International Folk Dance, so at an early stage I got it arranged with Professor Chen that she would teach her specialty whilst I taught mine. It all worked out extremely well, and we had a marvelously interesting and thoroughly enjoyable visit.

At the end of the Xian period, the University, in a charming little ceremony, made me an Honorary Professor in the Department of Avionics, coupled with an invitation to my wife and myself to repeat the visit every two years—an invitation we happily accepted.

Hong Kong

We were advised to spend a day or two in Hong Kong before going to China to give ourselves a chance to get over jet lag. This did not quite work out since we know quite a lot of people in Hong Kong, and their generous hospitality gave us very little time to rest. However, we did overcome the jet lag in the five days we spent in Hong Kong, and on Sunday 3rd May 1981 we took off for Canton on the first leg of our journey.

Dr. Cullen is a Professor of Electrical Engineering at University College London. He was formerly Pender Professor and Head of the Department. He is an Officer of the Order of the British Empire, a Fellow of the Royal Society, and a Fellow of the Fellowship of Engineering. He is a member of the Eta Kappa Nu Association.

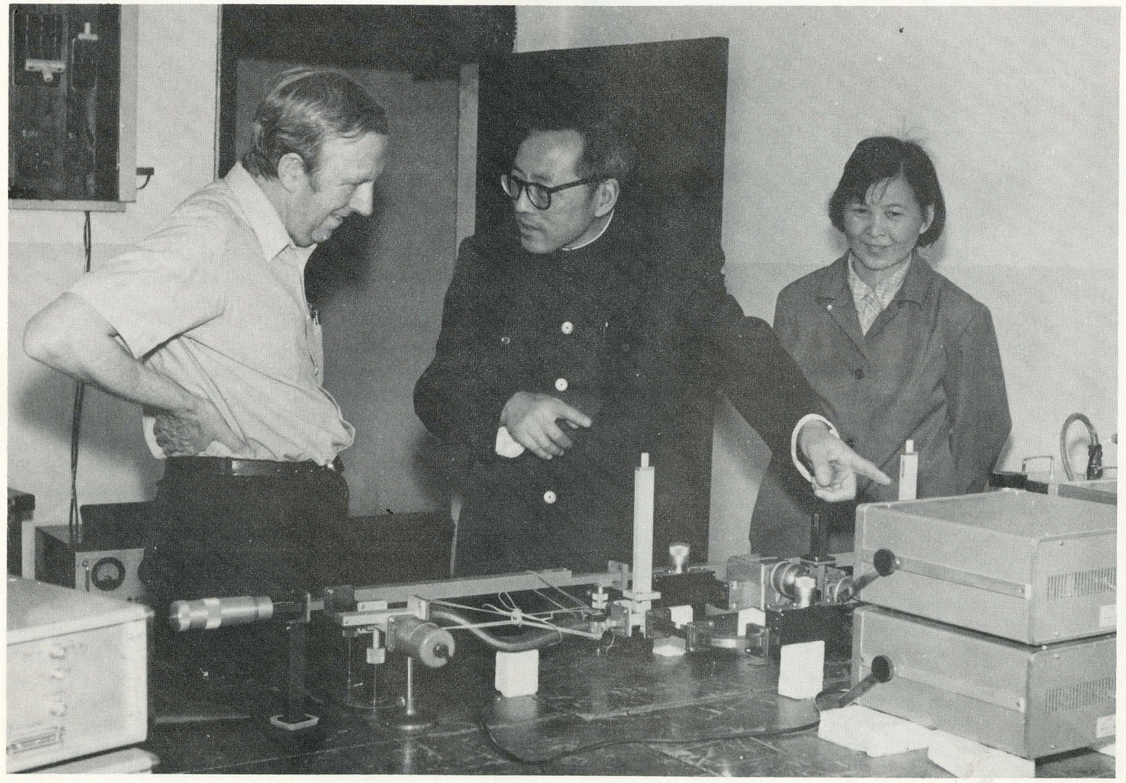
The first Pender Professor at the University College London was Sir Ambrose Fleming (1886-1928) the inventor of the Fleming Valve (Diode Tube). Dr. E.A. Ash, F.Eng., F.R.S., is now Pender Professor and Head of the Department.

Canton to Xian

We were met at Canton airport by Mr. Ma and Miss Chung. These two people work for the Aero-Technology Import and Export Company located in Canton and coming under the Ministry of Aviation. From that point onwards they took control of our baggage etc., and the customs formalities were very speedily concluded with no effort on our part. As far as we could see our luggage was not even opened. We had lunch at the airport with Mr. Ma and Miss Chung since our flight to Xian was delayed. The airport itself is pretty basic with very little in the way of facilities—apparently a new airport building is planned. Our plane finally arrived and we took off, arriving in Xian around 4:15 pm. We were met directly off the plane in Xian by Professor Tang, Head of the Avionics Department and my former student, now Professor Chen, of the Northwestern Polytechnical University. It was Professor Chen who organized the whole trip and arranged the invitation in the first place. We were also met by a group from the Shangsi Song and Dance Society who had come to welcome Margaret. Arrangements were made to get our baggage from the plane and while that was being done I talked with Professors Chen and Tang about the arrangements for my lectures. Meanwhile Margaret was talking with the Shangsi Song and Dance people about the arrangements for her dancing course. All these arrangements were entirely satisfactory and we were relieved to find that in spite of warnings that we might be pressured into doing far more than we had intended to do, we found ourselves pleasantly lightly loaded. I lectured in the morning from 8:15 a.m. till about 10:30 a.m., with a break for tea, whilst Margaret taught from 8 a.m. to about 11:15, teaching two separate groups—one local, and one rather more talented drawn widely from the Shangsi Province.

On the first morning, Monday May 4th, we met at 8 a.m. with Vice-President Wang, Professor Chen, Professor Tang (the Head of Avionics) and a number of other Heads of Departments in the University. We were extremely kindly received and the vice-President began by giving us a little background information on the Northwestern Polytechnical University. The University now has 4,500 undergraduate students and about 150 postgraduate students. It is a four year course so that there are about a thousand students in each year of the course. They have a Masters degree course of two years and Ph.D study would normally require a further four years. The University comes under the Ministry of Aviation and it is the Ministry of Aviation that

Prof. Alex L. Cullen with Prof. F.C. Chen of the Department of Physics, East China Normal University, Shanghai, and Mrs. Chu Xie-Zhi, a member of his staff.



supplies money for research, etc. There are altogether eight departments in the University, of which Avionics is the one with which I had most contact. After our meeting with the Vice-President, Margaret and I went our separate ways. I gave an introductory lecture whilst Margaret had yet another discussion meeting, this time with the Shangsi dancing people. We were glad to have our afternoon free to rest after a rather brisk introduction to Xian. After dinner in the evening we were taken to see a performance by the Shangsi Song and Dance Society at the local theatre. This was one of a number of different items in a programme apparently designed for some Japanese visitors to Xian. Professor Tang came with us together with Mrs. Wang who had been appointed interpreter for Margaret.

On Tuesday May 5th we began the regular daily routine, dance teaching beginning at 8 o'clock, my lectures beginning at 8:15 finishing about 10:30, then into the car to go round and pick up Margaret when she had finished the dancing class. We normally had our afternoons and evenings free, but the evening of May 5th was devoted to a reception in our honour at the Xian Restaruant. The vice-President took the Chair, since the President was on vacation. It was a delightful evening, beginning with a very pleasant welcoming speech by the Vice-President. In the course of it he informed me that the University wished to confer upon me the title of Honorary Professor. I had already been sounded out on this by Professor Chen and, of course, I told him in my reply that I would be honoured to accept the appointment.

Notes on lecture arrangements

The lecture room was a large hall, capable of seating, I suppose, 200 people quite comfortably. There were about 70 to 80 attending the lectures at a rough count. The seating was in chairs on a level floor, and only the front row had the advantage of a desk on which to rest their books. I lectured on a fairly high dais with good overhead projector facilities. One overhead projector was built into the lecture table, the other—apparently portable—was set alongside and presumably was only to be used in emergencies. Minor emergencies occurred several times involving failure of the overhead projector supply, but these were always quickly corrected. The lecture was recorded, including the sentence-by-sentence translation into Chinese, and the class attended again in the afternoon to hear a replay of the lecture, together with a second showing of my transparencies which I had left behind with Professor Chen. This was the pattern to be adopted from then on. Those attending the lectures included academic staff from

Margaret and Alex on a boat on Tai Lake, Wuxie (A side trip from Shanghai)—A view of the lake—Bicycles passing our hotel front entrance in Xian.

the North Western Polytechnical University, and also postgraduate students, but additionally there were students from other universities and from industrial companies in the neighborhood. Two came from Beijing and one at least from Shanghai, perhaps to get a preview.

The main part of the course was intended to be on surface waves, with an introduction to optical fibres. I had already given a course of lectures on the fundamental electromagnetics of such waveguides at a summer school at Lannion in Brittany in 1973, and I had sent to Professor Chen my notes for that summer school as an indication of the kind of thing I could do for them. In correspondence he suggested that a little more emphasis on optical fibres would be desirable. Accordingly I spent some time in bringing my lecture notes up-to-date in this respect, for example dealing with leaky waves and linearly polarized modes. I had also been told by correspondence with Professor Chen that there would be an interest in microwave measurement topics, and that the work of open resonators and 6-port techniques at UCL would be of interest; perhaps one of the 2-hour lectures on each topic. After my second lecture on Tuesday morning I asked Professor Chen if he would sound out the class to see if these proposals for the course of lectures, which I had explained to them in the first lecture, would be generally acceptable. He did this on the Tuesday afternoon and discovered a greater interest in the microwave and millimetre wave topics than he had anticipated. This meant a certain amount of recasting of my thoughts and the preparation of additional transparencies of microwave topics. Fortunately, I had also put in a batch of 50mm transparencies on millimetre dielectric waveguides, and on the 7-port technique now being used at UCL, so it was not too difficult to meet their wishes.

On Thursday May 7th I suggested that it might be useful to have a little informal discussion after the lecture. During the lecture I felt myself somewhat isolated, partly because of the relatively large class of 70 or 80 people, and partly because of the necessity to work through an interpreter. I had heard, however, from Mr. Xu, one of the postgraduate students who comes each morning with the car to collect me, that most of the people in the class can speak a little English and that most of them could follow my lectures fairly well before the Chinese translation, so it seemed a good idea to try to arrange for a little discussion in English. After the lecture, 20 to 30 of the class stayed behind, and we sat around in an informal group to discuss topics of common interest. I was told that there are in China now two optical fibre links, though they were described as being over rather short distances. I met a Professor and an Assistant Professor from Beijing Institute of Technology; the department from which they came is on optical systems. They were interested in lasers, and particularly keen to know more about the open resonator work that we have been doing. I asked a question about the Hewlett-Packard network analyser. There are a number of these in China, and I spoke with one man who had one in his laboratory. He said it was controlled by a desk top calculator, if I understood his description correctly. We went into the question of calibration stability and he claimed that calibration of his network analyser remained valid for a period of for as long as three months. This is somewhat at variance with our experience, but we did not discuss the relative ages of the two instruments or the standard of accuracy which is regarded as unacceptable.

Some notes on the hotel

The Ren-Min (Peoples') Hotel where we stayed is reasonably comfortable. It is very old fashioned in style with very high ceilings. We had a bedroom with bathroom attached and a small sitting room. The beds were rather hard and in my case a little lumpy, but we slept very well on the whole. Both the bedroom and the sitting room had Hitachi air conditioners—these were excellent, very efficient, and surprisingly quiet. In the sitting room there was a large desk with a comfortable chair at which I did my work; there were also two armchairs, and a large settee capable of seating three people in comfort. There were two small units, between the chairs and the settee, for standing drinks on, and there was a massive coffee table in a similar style in front of the settee. There was also a cupboard with sliding glass doors in one section containing glasses, a drawer and two cupboards useful for storing things. Storage was actually a problem—the bedroom had no wardrobe—simply a coat stand on which we had to hang everything that we didn't put into the drawers in the chest of drawers. There was a telephone on the desk in the sitting room which we did not dare to use. Hot water is provided daily so it is very easy to make tea and we brought lots of tea bags with us. We do, however, quite like the native tea provided and we used this frequently. Boiled cold water is supposed to be provided but our experience was less satisfactory in this respect. Laundry was carried out for us and there was supposed to be no charge. On the first occasion when quite a lot of laundry was done there was no charge. On the second occasion the girl delivering a relatively small amount presented a bill. Communication was impossible since she knew no English and in the end it seemed easiest to pay the bill, especially as it only amounted to about 40p. The next day another girl came with some laundry. The charge was 3 yen. I gave her 4 yen and she had no change and seemed to think that this was an insoluble problem. She went away to get some change. She then came back with the news that we did not need to pay after all! The next night, a young man brought the laundry and went away with the bill without even presenting it to us so somehow that problem was solved.

Margaret's dance teaching had been highly successful and the Shangsi Provincial Dance Troupe now have a number of new items in their repetoire,

including a suite of four English dances. Margaret learned the Chinese Water Sleeve dance and found the Chinese people *very* pleasant and helpful to work with, whether as a teacher or as a student. In the remaining ten days or so of our stay in Xian a number of things had to be fitted in. The Shangsi Dance Troupe gave a splendid party for Margaret and me. In the last week of our stay Margaret spent two days being shown some of the arts and crafts of the area by the Shangsi Dance Troupe people.

I was pleased to get a good question on backward waves on uniform structures from Mr. Xu, the postgraduate student, who has been taking me around. I answered this in the class and a day or two later got a set of six written questions which I answered in the lecture this morning. This took about three quarters of an hour to deal with but was obviously very well received. The questions were almost all good ones, one or two very good ones requiring a certain amount of preparation. I had to come back in the break after the first half of my lecture this morning to answer a question via Professor Chen as interpreter, from a lady student who spoke no English, apparently. She wanted further information about backward waves and I promised to say a little bit more on the topic in my next lecture. Though the students are obviously greatly stimulated by interesting ideas, regardless of immediate applicability, there are of course those in the class whose primary interest is with applications and wanted more information in this area. It is very hard to judge if the balance is right, especially when most of the discussion has to take place via an interpreter, but I felt that I had been treated extremely well, and in Beijing and Shanghai I got equally good treatment.

A note on the bicycle in Xian

There are nearly 3 million people in Xian and 1 million bicycles. The ratio of bicycles to cars on the road is about the inverse to the ratio in England, except that there are probably fewer cars. There are no private cars and the most common motorized vehicles are buses, small vans, often with handlebars inside instead of a steering wheel and a single front wheel, motorcycles with sidecars, and the occasional solo motor bike. In the main roads in Xian cyclists are expected to keep away from the center of the road within a space marked by a dotted line along the road and the kerb. They do this more or less, but rather frequently stray into the middle section. Traffic is supposed to drive on the right, but because of the bicycle overflow cars, buses and lorries drive straight down the middle of the road until they meet one coming the other way. They then both blow their horns to clear the way immediately ahead of straying bicycles and carry on to the next obstruction; overtaking follows a similar pattern. The driver wishing to overtake pulls out to see if the coast is clear; if it is he blows his horn incessantly encouraging the driver of the vehicle being overtaken to do the same, till eventually cyclists clear out of the middle area and the overtaking can take place. Judgment of whether the way is clear for overtaking is a bit different from the UK standard and rather near misses seem quite frequent. Pedestrians and cyclists have little road sense and will frequently walk straight out into the middle of the road without looking, or swing out from a cycle track in the same way. It really is amazing that there are not more accidents. We drove around, in the car provided by the University, with a driver and an interpreter, and driving down the main street in Xian the horn almost never stopped—a series of peremptroy blasts to clear cyclists and pedestrians out of the way as we progressed down the road at a steady 20 miles an hour, leaving a trail of startled faces and palpitating hearts in our wake. The steady 20 miles an hour seemed to be a characteristic feature; nobody seemed to want to slow down even in a busy street. Cyclists too, had the same love of proceeding at exactly the same pace. Accidents were avoided by skillful weaving in and out, and the concentration needed by the car drivers must have been terrific. Because of the inversion in the proportion of cars to cycles car parks are not needed. It's perfectly easy to park a car anywhere along the road in Xian and the cycles simply flow round it. We wanted to look at the Bell Tower at the intersection of the main North/South and East/West roads through Xian one morning. The driver simply drove up to it and parked his car outside and waited till we came out. It is as if one wanted to have a look at Eros in Piccadilly Circus and parked the car just beside it. On the other hand, one million cycles, relatively small as they are, do require some parking space. Cycle parks abound on the pleasantly wide pavements—areas taking perhaps 200 cycles are roped off and a custodian locks up the cycle with a numbered padlock, presumably the owner of the cycle is issued with a ticket enabling him to claim it on his return. Rather amazingly, at nights, cyclists do not carry lamps—in spite of a law that says they must—they mostly have reflectors, although not very efficient ones. This must add enormously to the difficulty for the car or bus driver since the roads are not particularly well lit either. Since there are no private cars in China, anyone wanting to move anything from one place to another has to do it with the help of his bicycle—anything from a radio to a door to a bundle of chickens ready for plucking. There are many things in favor of this flood of bicycles. They don't pollute and they are quiet, apart from the tinkling of bells to warn straying pedestrians. Walking along the road by our hotel a little way out of the center of the city at 5 o'clock when everyone is leaving work, the thought struck us to consider what the road would be like if the same number of people were leaving by car. I believe China has decided not to develop the automobile industry. As we walked along the main road in the rush hour and the cycles passed silently by, this seemed an admirable decision.

I am still amazed by the casual nature of the cycling and walking on the main roads in China. It seems to be the exception rather than the rule to look before you leap, and cyclists and pedestrians alike seem to rely entirely for survival on being warned by the sudden blowing of the horn of an approaching vehicle. Cars are few certainly, but in the center of the town, there are quite a few lorries and vans. They certainly can't be ignored if you value your life. The other strange feature is the way intersections are negotiated. Traffic is supposed to keep to the right, but if you happen to want to turn left at a major intersection you simply swing across to the wrong side of the road making spontaneous arrangements with the oncoming flood of cycles as you pass through it, and having got round the corner, swing back to the right side of the road again. Amazingly cars do the same, and at times I found my daily journey to the University quite hair-raising.

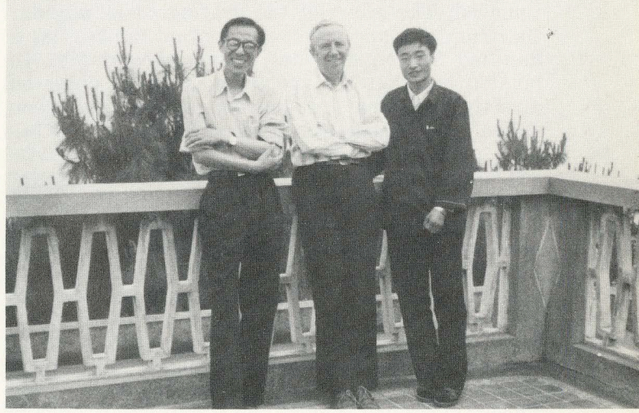
A note on air travel

Flying by China Air Lines is reasonably comfortable but rather bizarre. All the planes I have flown in have been Tridents—rather ancient to judge by the usually tatty interiors. The flight from Hong Kong to Guanzhou was of half an hour duration and the flight from Guanzhou to Xian about two hours. Taking off from Hong Kong for Guanzhou we thundered down the runway with everyone drinking Coca-Cola through straws! In each case we were offered sweets but that seemed to be the limit of the resources as far as refreshment was concerned. Announcements are made over a low-fi system in what sounded like Chinese, and also in quite incomprehensible English—only the odd word or two was intelligible. As for whole sentences, they might just as well have been in Chinese!

The Airports at Xian and Guanzhou have small and very run down buildings, although we did have a reasonably good lunch at the airport at Guanzhou.

Some notes on Academic life in China

This may be too general a heading as there are some pecularities about the Northwestern Polytechnical University; indeed, the most obvious one is that it is administered jointly by the Ministry of Education and by the Ministry of Aviation. The role of the Ministry of Education is simply to lay down the general policy in University education, matters relating to length of courses, curricular, degree system and so on. The funds for the Northwestern Polytechnical University come entirely from the Ministry of Aviation with no contribution at all from the Ministry of Education. Appointments to Academic Posts in Northwestern Polytechnical University are made directly by the University itself up to Lecturer level. Above this level, Associate Professor and full Professor, appointments have to be made by a Committee set up by the Ministry of Aviation, and having on it experts from other



Margaret with Zhang-Li and her two sisters, looking at an album of pictures which had been presented to Margaret at the end of her course.—A street in Xian—Alex Cullen (center) with Prof. Chen Guo-rui and a local guide at Wuxie.

Universities. The size of the Committee is usually about 10 people and the starting point is a recommendation from the University. If this recommendation is accepted the appointment is made. The Ministry of Education is notified, but this is a formality, and it would be quite an extraordinary situation if the Ministry of Education were to object, since they have no experts of their own comparable with the experts on the Committee of Ten set up to consider the recommendation. In principle, however, the Ministry of Education *could* object. Appointments are made essentially for life, the concept of retirement does not exist. This seems reminiscent of the old days of Oxford and Cambridge Fellowships which I seem to remember were also held for life. This must, to some extent, count for the very considerable apparent over staffing. For example, Northwestern Polytechnical University has about 4,200 students and 1,300 staff, a very favorable student/staff ratio indeed. If one makes the assumption that on average staff over 65 contribute little to the running of a department, then the effective number of staff is more like a thousand. Even so the ratio is a pretty good one, moreover there seems to be no inclination or incentive to reduce it.

A note on Mr. Xu's research

This is a study of a set of three diffraction gratings spaced an equal distance apart. They are illuminated at normal incidence through a small horn at 8mm wavelength with vertical polarization. The outer two diffraction gratings are horizontal, the center one can be rotated. In this way a variable—Q filter is achieved. The experimental set-up is well conceived, though quite simple. The theory is excellent. Each grating is represented by a T-network and is assumed to be loss free, though this restriction could easily be removed. The effect of the grating on an angular spectrum of plane waves incident on the grating is handled by conventional matrix theory. Mr. Xu pointed out that the spectrum could be observed directly at optical frequencies, or of course when optical—type assumptions are valid. The theory has been developed a good deal further and includes convolution integrals involving the incident angular spectrum and the transmission matrix of the grating. The really amazing thing is that Mr. Xu who is doing all this work for his Master's degree had no undergraduate University education, because of the cultural revolution. He was 17 years of age when the revolution began and he learnt all his electromagnetic theory by himself, from the age of 17 onwards, using Ramo and Whinnery "Fields and Waves in Modern Radio", and Collin's book "Field Theory of Guided Waves." He is extremely quick to take up new ideas and obviously has tremendous drive to make full use of the opportunities he now has. He is writing computer programmes for the convolution integrals he requires and this is a fairly tedious progress since it has to be done by punched cards.

Note on a visit to the Post Office Research Establishment in Xian

The laboratory is organized into about eight groups of which I was shown the microwave group. The laboratory was fairly well equipped in very run down, poorly maintained buildings, with quite a lot of dust about. I was shown a waveguide circulator for X-band which they had designed, with an insertion loss of a tenth of a dB, and an isolation of 30dB. A co-axial version had an insertion loss of 0.2 dB. A waveguide to microstrip transition, with a Chebyscheff response looked interesting and was new to me, though apparently well known in microstrip engineering. It consisted of a ridge waveguide tapering down in Chebyscheff steps to empty guide. At the ridge end it had a characteristic impedance which matched the microstrip characteristic impedance. The overall impression was of a good standard of work, and a very creditable recovery from the cultural revolution.

A note on the Radio factory in Shanghai

The radio factory I visited makes mainly microwave instruments. At present the demand for microwave instruments has slackened and so, as the Deputy Chief Engineer (this interesting and very nice man had been educated at an American mission school in China and spoke perfect American!) put it, in order to eat they are now making measuring instruments at lower frequencies, in fact from 20 hertz onwards. Amongst these are sweep generators for the broadcast and TV bands. Most of the instruments made are transistorized, but integrated circuits are not yet used. I saw one instrument, however, that still used valves (tubes). It apparently works well and meets the requirements, so they see no need to change—at least in the immediate future. All the necessary valves are made in China so if the planning is right there need be no spares problem. The Company is not expected to use its initiative in developing new lines but simply does what it is told to do. Much of the work is making copies of Hewlett-Packard and other commercial instruments. In former years Russian instruments were sometimes copied, but now it seems to be the Western world exclusively. That establishes the pattern. They are at present developing a Hewlett-Packard-type network analyser; it certainly is close, if not an exact copy, of the Hewlett-Packard one. I asked about exports. At present the Company does no export business.

Once again the decision to attempt to export their instruments all rests with some central planning authority, rather than with the Company itself. As the Deputy Chief Engineer reminded me, this is not a capitalist society! There is, however, some competition I asked whether the Company were making frequency counters and was told that there was another firm in Shanghai which made frequency counters, and as they were doing a good job there was no point in the Company embarking on these. "Suppose they were not doing a good job?" was my next question. The answer was that there are two other Companies in China making frequency counters and the best one would tend to get most of the orders. There is motivation for each Company to do a better job than any other Companies making a comparable product. The fact that the employees of the factory sometimes, if not always get a share of the profits must also provide motiviation to do a better job.

Getting back to the frequency counter example—suppose that none of the three Companies making frequency counters could do an adequate job, the situation then is that they could import, for example, from Hewlett-Packard or Marconi Instruments, but to do so they would have to make a case and establish that the Chinese made instruments did not meet thier needs. This is reminiscent of the situation UK Universities encounter in purchasing American manufactured equipment with Research Council funds. The Radio factory employs about 1200 people all told with about 200 professional engineers.

On the ground floor of the building is the production shop where I saw castings being machined for the turret of a multi-range signal generator, slotted lines for around 2 cm wavelength, heat exchangers for a medium power circulating fluid wattmeter, and other items. The policy is to use Chinese-made machine tools virtually exclusively. There were one or two exceptions only in this quite large machine shop.

On the next floor we saw the components being assembled into complete units. They were doing a production run of slotted lines and one of impedance bridges for lower frequencies perhaps up to about a gigahertz.

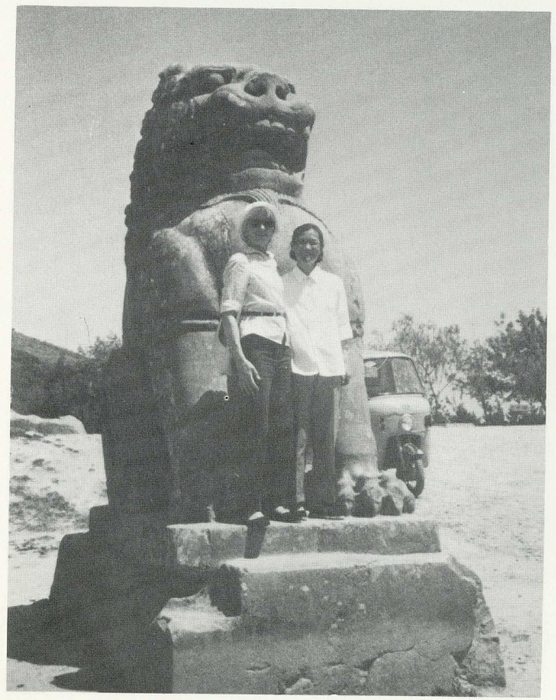
Within its prescribed limitations, I had the impression of a well-run organization, doing its job efficiently and enthusiastically.

Conclusion

We returned to Hong Kong via Guangzhou, where we stayed overnight in the most modern-Western type hotel we encountered in our stay. It was very comfortable. Then the next day, collected again by Mr. Ma and Miss Chung, we set off for Hong Kong once more.

The contrast is terrific, of course. On the one hand, China, with its naive friendliness, total honesty, low standard of living, and rather calm way of life—on the other hand Hong Kong, capitalism *in extremis*, with the shops full of tempting new products, everyone out to succeed, and a pace of life which even most westerners would find excessive.

There is no need to emphasize the obvious differences; suffice it to say Margaret and I look forward with great pleasure to our next visit to China *and* to Hong Kong.



Margaret with Mrs. Chen at a stone lion guarding the Chen Tomb, Xian. Mrs. Chen is the wife of Professor Chen Guo-rui who organized our trip.

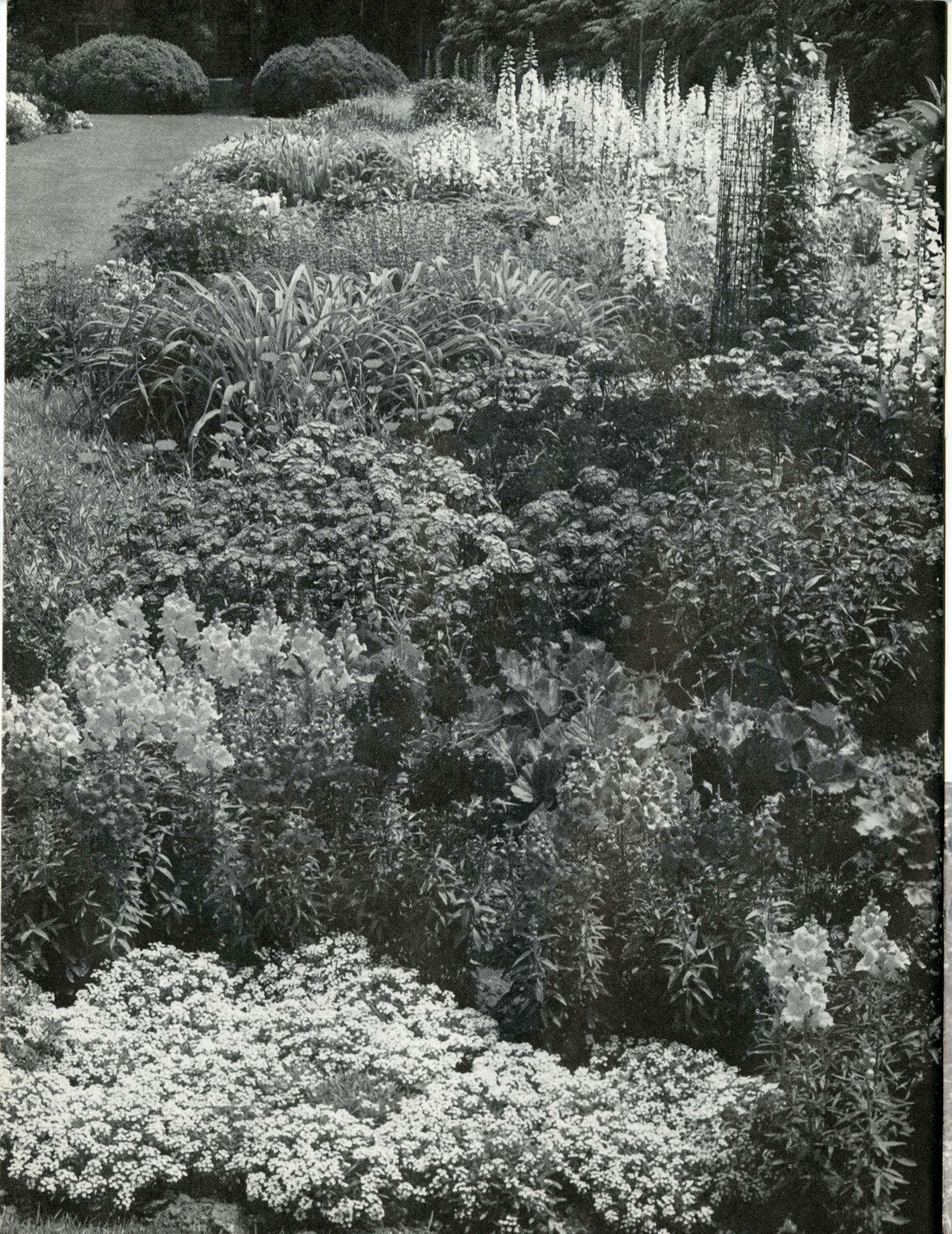
The Giant's Garden

by Oscar Wilde

•

Presented in memory of

Winston E. Kock



Every afternoon as they were coming from school, the children used to go and play in the Giant's Garden. It was a large, lovely garden, with soft green grass. Here and there over the grass stood beautiful flowers like stars, and there were twelve peach trees that in the springtime broke out into delicate blossoms of pink and pearl, and in the autumn bore rich fruit. The birds sat on the trees and sang so sweetly that the children used to stop their games in order to listen to them. "How happy we are here!" they cried to each other.

One day the Giant came back from a seven-year visit at the home of a friend. He had said all that he had to say, as he was not very talkative. When he arrived he saw the children playing in the garden. "What are you doing there?" he cried in a very gruff voice, and the children ran away. "My own garden is my own garden," said the Giant; "anyone can understand that, and I will allow nobody to play in it but myself." So he built a high wall all around it, and put up a notice board, TRESPASSERS WILL BE PROSECUTED.

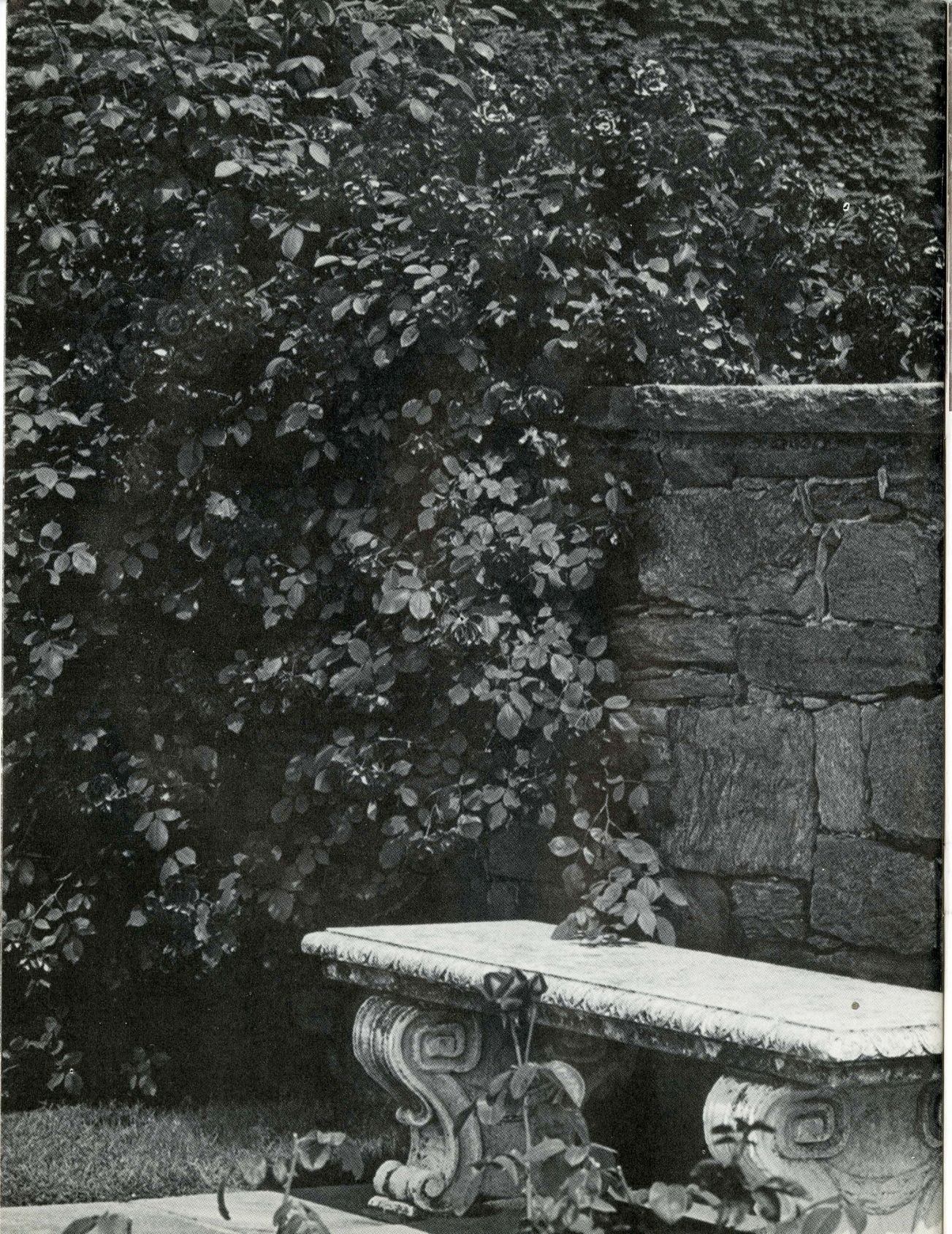
The poor children had now nowhere to play. They tried to play on the road, but the road was very dusty and full of hard stones, and they did not find it pleasant. They used to wander round the high wall when their lessons were over, and talk about the beautiful garden inside. "How happy we were there," they said to each other.

Then the Spring came, and all over the country there were little blossoms and little birds. Only in the garden of the Giant was it still winter. The birds did not care to sing in it as there were no children, and the trees forgot to blossom. Once a beautiful flower put its head out from the grass, but when it saw the notice board it was so sorry for the children that it slipped back into the ground again, and went off to sleep.

The only people who were pleased were the Snow and Frost. "Spring has forgotten this garden," they cried, "so we will live here all the year round." The Snow covered up the grass with her great white cloak, and the Frost painted all the trees silver. Then they invited the North Wind to stay with them, and he came. He was wrapped in furs, and he roared all day about the garden, and blew the chimney pots down. "This is a delightful spot," he said, "we must ask the Hail on a visit." So the Hail came. Every day for three hours he rattled on the roof of the castle till he broke most of the slates, and then he ran round and round the garden as fast as he could go. He was dressed in grey, and his breath was like ice. "I cannot understand why the Spring is so late in coming," said the Giant, as he sat at the window and looked out at his cold white garden. "I hope there will be a change in the weather."

But the Spring never came, nor the Summer. The Autumn gave golden fruit to every garden, but to the Giant's garden she gave none. So it was always Winter there, and the North Wind, and the Hail, and the Frost, and the Snow danced about through the trees. One morning the Giant was laying awake in bed when he heard some lovely music. It sounded so sweet to his ears that he thought it must be the King's musicians passing by. It was really only a little linnet singing outside his window, but it was so long since he had heard a bird sing in his garden that it seemed to him to be the most beautiful music in the world. Then the Hail stopped dancing over his head, and the North Wind ceased roaring, and a delicious perfume came to him through the open casement. "I believe the Spring has come at last," said the Giant; and he jumped out of bed and looked out.

What did he see? He saw a most wonderful sight. Through a little hole in the wall the children had crept in, and they were sitting in the branches of the trees. In every tree that he could see there was a little child. And the trees were so glad to have the children back again that they had covered themselves with blossoms, and were waving their arms gently above the children's heads. The birds were flying about twittering with delight, and the flowers were looking up through the green grass and laughing.



It was a lovely scene, only in one corner was it still winter. It was the farthest corner of the garden and in it was standing a little boy. He was so small that he could not reach up to the branches of the tree, and he was wandering all round it, crying bitterly. The poor tree was still quite covered with frost and snow, and the North Wind was blowing and roaring above it. "Climb up! little boy," said the Tree, and it bent its branches down as low as it could; but the boy was too tiny. And the Giant's heart melted as he looked out. "Now I know why the Spring would not come here. I will put the little boy on the top of the tree, and then I will knock down the wall, and my garden shall be the children's playground for ever and ever."

So he crept downstairs and opened the front door quite softly, and went out into the garden. But when the children saw him they were so frightened that they all ran away, and the garden became winter again. Only the little boy did not run, for his eyes were so full of tears that he did not see the Giant coming. And the Giant stole up behind him and took him gently in his hand, and put him up into the tree. And the tree broke at once into blossom, and the birds came and sang in it, and the little boy stretched out his two arms and flung them around the Giant's neck, and kissed him. And the other children, when they saw the Giant, came running back, and with them came the Spring. "It is your garden now, little children," said the Giant, and he took a great axe and knocked down the wall. And when the people were going to market at twelve o'clock they found the Giant playing with the children in the most beautiful garden they had ever seen.

All day long they played, and in the evening they came to the Giant to bid him good-bye. "But where is your little companion?" he said: "the boy I put into the tree." The Giant loved him best because he had kissed him. "We don't know," answered the children; "he has gone away." You must tell him to be sure to come here tomorrow," said the Giant. But the children said that they did not know where he lived, and had never seen him before; and the Giant felt very sad.

Every afternoon when school was over, the children came and played with the Giant. But the little boy whom the Giant loved was never seen again. The Giant was very kind to all the children, yet he longed for his first little friend, and often spoke of him. "How I would like to see him!" he used to say.

Years went over, and the Giant grew very old and feeble. He could not play about any more, so he sat in a huge armchair, and watched the children at their games, and admired his garden. "I have many beautiful flowers," he said; "but the children are the most beautiful flowers of all." One winter morning he looked out of his window as he was dressing. He did not hate the Winter now, for he knew that it was merely the Spring asleep, and the flowers were resting. Suddenly he rubbed his eyes in wonder, and looked and looked. It certainly was a marvelous sight. In the farthest corner of the garden was a tree quite covered with lovely white blossoms. Its branches were all golden, and silver fruit hung down from them, and underneath it stood the little boy he had loved.

Downstairs ran the Giant in great joy, and out into the garden. He hastened across the grass, and came near to the child. And when he came quite close his face grew red with anger, and he said, "Who hath dared to wound thee?" For on the palms of the child's hands were the prints of two nails, and the prints of two nails were on the little feet. "Who hath dared to wound thee?" cried the Giant; "tell me, that I may take my big sword and slay him."

"Nay!" answered the child; 'these are but the wounds of Love." "Who art thou? said the Giant, and a strange awe fell on him, and he knelt before the little child. And the child smiled on the Giant, and said to him, "You let me play once in your garden, today you shall come with me to my garden, which is Paradise."

And when the children ran in that afternoon, they found the Giant lying dead under the tree, all covered with white blossoms.

MERRY MOMENTS WITH MARCIA

Philanthropist: A person who gives all his money to very grateful strangers so his relatives wouldn't have to argue and fuss about it.

Jake: "Did he take his misfortunes like a man?"
Buck: "Precisely—he laid the blame on his wife."

"Bob: "I slept like a log."
Mary: "Yes, I heard the sawmill."

A mother was having a hard time getting her son to go to school in the morning.
"Nobody likes me in school," he complained. "The teachers don't like me, the kids don't like me, the superintendent wants to transfer me, the bus drivers hate me, the school board wants me to drop out, and even the custodians have it in for me. I don't want to go to school."
"But you have to go to school," countered his mother. "You are healthy, you have a lot to learn, you have something to offer others, you are a leader. And besides, you are 42 years old and you are the principal."

Sign above umbrellas and rain apparel: Thunderwear.

Ted: "Do you file your fingernails?"
Harry: "Naw—I just throw them away after I cut them."

George tells me the Russians are getting more confident every day. They've been watching television and they think every American has indigestion, arthritis, tired blood and nagging headaches.

First Bum: "There's only one thing that bugs me about this revolution."
Second Bum: "What's that?"
First Bum: "Well—what happens to our unemployment checks when we overthrow the government?"

"In our family," a little girl told her teacher, "everybody marries relatives. My father married my mother, my uncle married my aunt, and the other day I found out that my grandmother married my grandfather."

Jimmy had been to a birthday party, and, knowing his weakness, his mother looked him straight in the eye and said, "I hope you didn't ask for a second piece of cake."
"No," replied Bobby. "I only asked Mrs. Williams for the recipe so you could make some like it and she gave me two more pieces of her own accord."

After many boring speakers had spoken, the last speaker rose to the platform clutching a bulky prepared speech. The guests could hardly conceal their restlesness. However, he made many friends when he said, "Friends, it's so late I've decided just to mail each of you a copy of this speech." Then he bowed and sat down.

"The smallest good deed is better than the grandest intention."

"The lazy man calls another's success good luck."

"Live wires do not require any charging."

"Power intoxicates more people than whiskey."

"Ulcers: not what you eat, what's eating you."

"Patience—the ability to idle your motor when you feel like stripping your gears."

"At meetings of clubs, by an effort of will,
I always contrive to keep perfectly still,
For it takes but a word of annoyance or pity
An Wham! there I am on another committee."

by MARCIA PETERMAN

CHAPTERS

BETA THETA CHAPTER, Massachusetts Institute of Technology—A project was the creation of "Captain Capacitor." Captain Capacitor was an attempt to raise the conciousness of electrical engineering undergraduates. The captain and his sidekick Charlie Chip (both in appropriate costumes) made the rounds of several electrical engineering courses, admonishing students to take interest in activities other than those purely academic. Several pairs of people donned the costumes to carry forth this message, including the president and vice-president for a few performances. The "invasions" were done with much humor and were enjoyed by nearly all (including the professors teaching the invaded classes).

The chapter has been involved in many other activities, including a bake sale. The most important, however, may turn out to be one initiated by our recording secretary, Hank Bromley. It was his idea that courses at MIT contain too much of formulas, problems, etc. and do not (except in rare cases) emphasize the responsibility of an engineer in choosing how to apply his knowledge. Hank felt that every professor should give at least one lecture on the existing applications of the techniques taught in the course, showing the alternatives open to someone working in the field. With this purpose, Hank has contacted many professors in the department and also quite a few other college electrical engineering departments. Although there have not yet been any concrete results, the response has been reassuringly positive, and he will continue this project in the fall.

Throughout the summer, such officers as were available have continued to meet. This group includes both the new (fall) officers and the old. We hope that these meetings will help establish some continuity of purpose, allowing the new officers to expand upon our beginning. *by Thomas Duffey*

EPSILON BETA CHAPTER, Arizona State University—This year, backed by dedicated leadership and strong involvement by the members and faculty, Epsilon Beta Chapter has become stronger than ever. It is very gratifying to recall this past year with a report of our activities, which we present with pride here.

Club officers this past year were: Presidents Dan Huettl (fall semester) and Marvin McCarthy (spring semester), Vice-Presidents Marvin McCarthy (fall semester) and Paul Alonge (spring semester), Recording Secretary Linda Kropen, Corresponding Secretary Edward Jakl, Treasurer Bernie Smith and Bridge Correspondent Alan Righter.

At our first meeting (out of 35 held), on September 3, we formed committees, and due to the involvement of many members, this system worked very well. In addition to the Membership and Induction Committee, we formed a Call-Up Committee to phone members and remind them of events, and we began a Program Committee which was responsible for speakers at meetings and coordination with ASU's chapter of IEEE. One direct result of this committee effort was the newly-started tradition of a semi-annual Faculty Night, held jointly with IEEE, where faculty members spoke to interested students about their

24

THE ETA KAPPA NU COLLEGE OF BENEFACTORS

Admission to the College of Benefactors is available to members and non-members who would like to have their names associated with the Award Programs of Eta Kappa Nu. Or you may designate the name of a loved one or a name In Memoriam.

For details, please contact Eta Kappa Nu's Executive Secretary:

Prof. Paul K. Hudson
E.E. Department
University of Illinois
Urbana, Illinois 61820

THE ETA KAPPA NU COLLEGE OF BENEFACTORS

SUPREME BENEFACTOR
Edith Ann Koerner
Paul K. Hudson

HIGH BENEFACTOR
Norman R. Carson
Helene Koerner Gahlen
Lloyd Hunt
Fritz A. Koerner

BENEFACTOR
Marc Dodson
Frank B. Doyle
Larry Dwon
Irma Hanson
Fred Harrell
Edward Jordan
Omicron Chapter (Univ. of Minnesota)
Donald S. Pearson
Eugene Mueser
Everitt S. Lee
Sydney R. Parker
Howard H. Sheppard
Alan R. Stoudinger
Joanne Waite

(ISSN 0006 9809)
SECD 06 4700

Second-Class Postage
Paid at Lafayette, Indiana
and at Additional Offices

current research and interests. Good relations with ASU's IEEE branch have mutually benefitted both organizations.

Early in the semester, it became evident that we had to revise our bylaws, which had not been revised since 1963. Within two weeks, the wording on the document was updated, and it sent to Headquarters, where it was approved.

It also became evident that in order to foster a sense of involvement and achievement, we needed to organize group projects and events that would not only benefit Epsilon Beta but the whole Electrical Engineering Department, and the community as well. As a result, we organized plant trips, student/faculty as well as student/industry exchanges, a community service project, a study room set-up, and award contests in addition to our initiation and banquet events.

During the fall semester, in order to make our name more well known on campus, we decided to purchase T-shirts with HKN, ASU and the Wheatstone Bridge emblazoned on the front. These have proven to be very popular with the hot weather we have.

Epsilon Beta organized two field trips during the semester. In the fall, we went to Williams Air Force Base, east of Chandler, Arizona, for a look at their flight simulators. In the spring (March 26th) we loaded on a bus and went to Digital Equipment Corporation in north Phoenix. These field trips were very informative and enjoyable.

During the spring, with the help of IEEE, we converted an empty room in the Electrical Engineering Building into a study room, complete with tables, chairs and the latest technical journals. It has become a popular place to study, meet friends, do last-minute homework and rest.

This year, we made our member meetings much more enjoyable by inviting speakers to speak at them. Dr. Joseph Palais, who spoke on holography, and Dr. Ronald Roedel, who spoke about GaAlAs opto-isolators, were among these speakers, who attracted many interested students—many from outside of electrical engineering. This speaker series will be continued in the future.

Like any honor society, awards have played a big part in the Epsilon Beta Chapter year. Several of our ambitious members started their own committee to formulate and draft an Outstanding Student Award and an Outstanding Individual Award for special electrical engineering students. This year, for the first time, Epsilon Beta has also entered a student, Mr. William P. Risk, as our nominee for the Alton B. Zerby Outstanding Electrical Engineering Student Award.

As part of our community involvement, we co-sponsored (with IEEE) an Industry/Student Exchange where industry engineers (from Motorola, General Instruments, etc.) spoke to students about the current status of the semiconductor industry, and their involvement in it. Students also found out, from these engineers, what it is like to be an entry-level engineer in this broad field.

In keeping with the excellence and integrity that is synonymous with Eta Kappa Nu, we elected to participate in a community service project this spring. Many initiates and members participated in the Maricopa County Special Olympics on April 2nd, where they helped young and old handicapped and retarded athletes to compete in sporting events and games. We all felt like winners that day.

National Secretaries' Day was April 21st. The secretaries in the Electrical Engineering Department have been so good to us all year, typing and arranging; so we sent flowers to these ladies as appreciation for the excellent things they didn't have to do for us. *by Alan Righter*

DELTA GAMMA CHAPTER, Louisiana Tech University—The Delta Gamma Chapter at Louisiana Tech University is on the move. A new candidates program was started n the Spring 82 Quarter. The largest Spring Quarter initiation and fifth largest initiation in this chapter's history was held in the Spring of 82. This year will tell if the candidates program was a contributing factor.

The Annual Spring Cookout was the culmination of a good quarter. Much fun was had by all and new officers were elected. The officers for the 82-83 school year are:

Oscar Overton, Jr.
President
Sammuel G. Piazza
Vice-President
David Grosch
Treasurer
Ronald D. Swafford
Corresponding Secretary
Sharon L. Williams
Recording Secretary
Cameron H.G. Wright
Bridge Correspondent

The 1982 Sophomore of the year was announced and presented with a certificate. This award went to John M. LaCour. Last year's outstanding Sophomore was Cameron H.G. Wright.

Many new programs are in the works for the 82-83 school year. Keep an eye on this column as you will be hearing much from Delta Gamma Chapter in the coming year. *by Oscar Overton, Jr.*