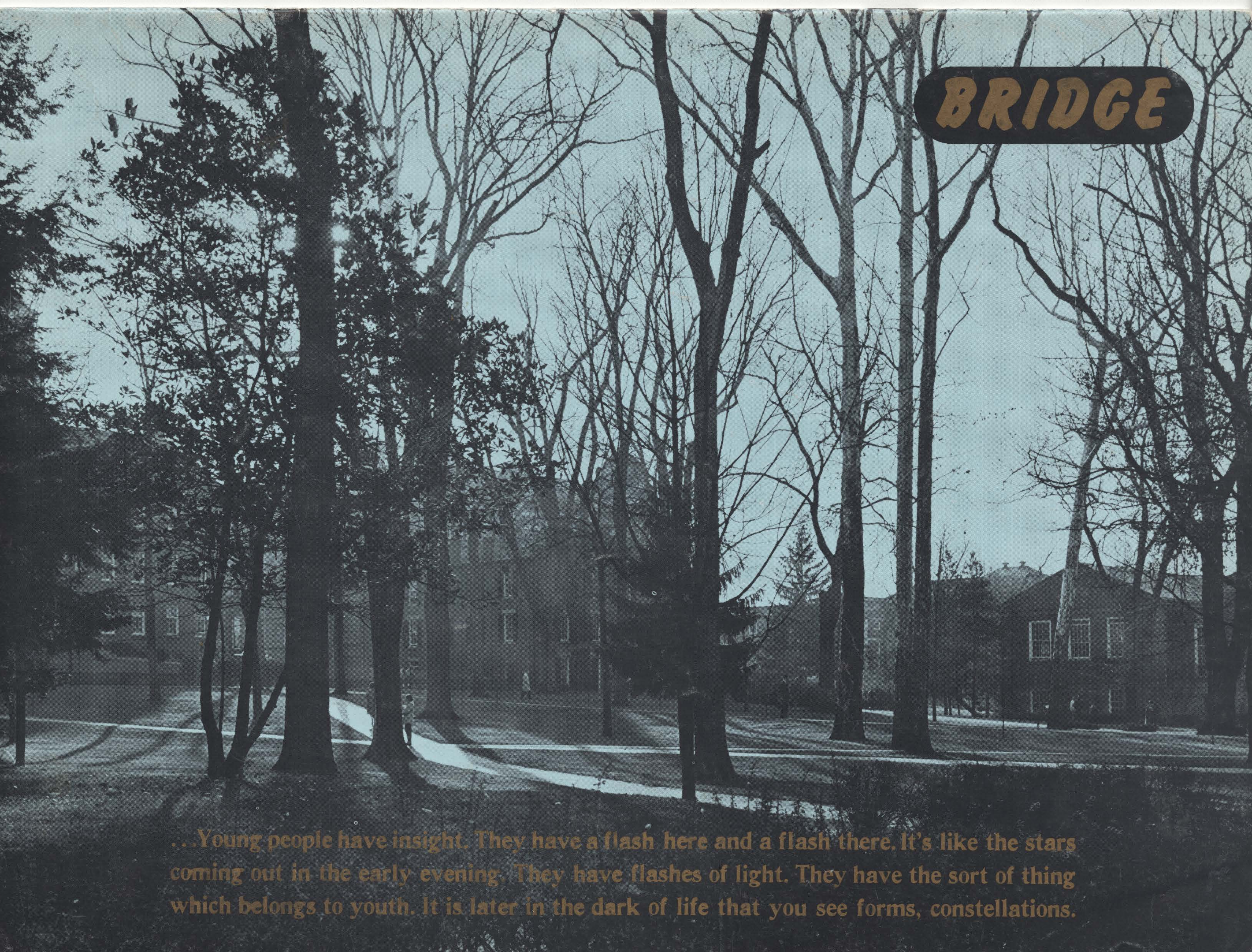
BRIDGE
...Young people have insight. They have a flash here and a flash there. It's like the stars coming out in the early evening. They have flashes of light. They have the sort of thing which belongs to youth. It is later in the dark of life that you see forms, constellations.

Bridge

of ETA KAPPA NU

Electrical Engineering Honor Society

SUMMER, 1965, Vol. 61, No. 4

Editor and Business Manager
Paul K. Hudson

Features

OUR COVER

The College Green of Ohio University, Athens, Ohio. (Delta Epsilon Chapter) The quotation is from the writings of Robert Frost. Photo courtesy Ohio University photographic Laboratory.

CIRCULATION

The paid ciculation of this issue of the BRIDGE is 16,044.

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Real and Imaginary

B. S. in W. E.

A Penetrating Look Into A New Frontier

by
PROF. COOLIDGE X. RAY
Clearview College

In the inexorable course of nature, times often arrive when the future appears to hold grim and angry events relating to our own lives. On these occasions we usually receive an abundance of advice from friends which can be summarized simply as "don't worry." But we worry anyway—long and hard—hour after hour—day after day. And finally when the terrible event is supposed to happen it just doesn't. As a matter of fact it is a universally recognized truism that the things we worry about most never happen, or at least not with the devastation formerly expected. And after each event has straightened out we say to ourselves "Why did I worry about that? Obviously there was nothing to worry about." Ha! Does this make sense to you? Does it make sense that you could always be wrong about something like this? Of course not. The truth of the matter is that there was indeed something terrible that needed worrying about but the actual worrying that you did prevented it from happening. If you hadn't worried the event would have gotten much worse and when it came it would have clobbered you good.

Now lets look on the other side of the coin. Have you ever noticed that problems that we have well in hand, and feel good about, have the disagreeable habit of blowing all to pieces, usually at

(Continued on Page 14)

Derby Winner????

MODERN ENGINEERING EDUCATION

DR. ERNST WEBER

President, Polytechnic Institute of Brooklyn

Eminent Member, Eta Kappa Nu

Engineering is the youngest major profession and has come of age essentially during World War II. Surely, we had tremendous engineering contributions to the industrialization of this country but most of the achievements had been initiated by the vision of financial and business entrepreneurs who had really no, or very little, training in the sciences and engineering. As a matter of fact, a study by the Scientific American [1] revealed that in 1900 only 7% of the top business leaders had any technical background and in 1925 this had grown to 13% or only about one in eight. In the last 13 years, however, the fraction of men in top industrial positions with technical background has risen to 36% and it is expected that it will continue to rise at a rate of at least 1% per year.

This changing pattern in management of industry is just one index of the ever stronger interaction of technology with society. At its last annual meeting, the Division of Engineering and Industrial Research of the National Research Council of the National Academy of Sciences [2] devoted a session to the theme "The Engineer and Society," stressing the functional role of the engineer in modern society, his political responsibilities and the effects of technology upon the socio-economic system in this country. Finally, last December 10, 1964, the organization of the National Academy of Engineering took place within the framework of the broad charter of the National Academy of Sciences, but as an autonomous and parallel consultative body to the legislative and executive branches of government.

What caused these astonishingly rapid developments and what are the implications for engineering education to be in tune with the times, to be *modern?* These questions are the more justified if we recall that accreditation of engineering curricula was only initiated in 1932 through the creation [3] of the Engineers Council for Professional Development (ECPD). In its first annual report, published in 1933, ECPD stated these objectives:

> "ITS (ECPD's) purpose is the enhancement of the professional status of the engineer. To this end it aims to coordinate and promote efforts and aspirations toward the higher professional standards of education and practice, *greater solidarity* of the profession, and greater effectiveness in dealing with technical, *social and economic* problems."

The acid test of the engineering profession came indeed, shortly thereafter in World War II which evolved as the supreme contest between major power groups of technological superiority. From radar to strategic mass bombing attacks, from submarine warfare to the winged rockets, from precision antiaircraft to the atomic bomb, an amazing array of new technical areas were opened up and developed under the strains of fight for survival, perhaps the most potent spur technology has ever found.

Radar required the development of microwave techniques, which in turn demanded full familiarity with electromagnetic wave propagation in bounded spaces, electronic shaping and most sensitive detection devices. Because of the lag in electrical engineering education, the first

(Continued on next page)

[1] "U.S. Industry: Under New Management," Scientific American, New York, N.Y.

[2] "The Engineer and Society," Printing and Publishing office of the National Academy of Sciences, National Research Council, Washington, D.C., 1964.

[3] "Present Status and Trends of Engineering Education in the United States," D. C. Jackson, Engineers Council for Professional Development, New York, N.Y., 1939.

WEBER (from page 5)

groups competent to deal with the advanced development problems were largely recruited from the physics laboratories of the nation. The challenges of the rapidly advancing theory and techniques [4] brought, however, scientists and engineers into most fruitful and mutually stimulating contact.

Feedback had been invented by H. S. Black [5] for the stabilization of amplifiers. The application to servo systems [6] made error correction of control systems possible, both for the target indicator as well as for the antiaircraft guns. It soon brought to attention man as an important link in the larger servo systems, initiating studies of the response characteristics of our senses and thus linking behavioral sciences with engineering.

Quantum theory, if taught to engineering students before the second World War, was received with hesitant suspicion until solid state devices [7] as radiation detectors or as active elements demonstrated the practical applicability. Then followed the rapid evolution of electronic computers into large automatic data processing machines, made possible through the use of solid state devices. In turn, the electronic computer families refined control systems to make them adaptive and permit complete automation of chemical and of mechanical production processes. The consequent dislocations in employment patterns of the labor forces have caused grave concern to sociologists and economists bringing the engineer face to face with socio-political questions.

The courageous decision to mass-produce fighter and bomber planes brought exorbitant demands upon crews and entrained intensive studies of biological systems. The then undreamed-of extension to winged missiles, to rockets, to ballistic intercontinental missiles, to satellites and space vehicles present fantastic demonstrations of the power of scientific engineering. With it have gone the far-reaching developments in space medicine, reflecting into biomechanical and biomedical engineering and culminating in molecular biology as an interdisciplinary field of tremendous potential.

Radio communication emerging out of World War I as a commercial possibility had extended into national network systems. But the perfection of microwave technology quickly fired imagination to seek global communication means with passive Echo satellites, the active Telstar series and the creation of COMSAT as an international communications corporation.

Many other areas indicative of the *remarriage* of science and engineering and of the broadening of *interdisciplinary* and *extradisciplinary* interests and concerns of engineering could be cited. I say remarriage of science and engineering because the inception of what might be identified [8] as the "Scientific Revolution" found discovery and application combined in the same individual. The estrangement came about in this country in the early days of the industrialization because of the terrific pace imposed by the vastness of the continent and the impatience of a powerfully striving nation. It is, indeed, through the gigantic mobilization of scientific and technological manpower by the Office of Scientific Research and Development (OSRD) that these partners were brought together again for what we hope to be a lasting reunion.

Perhaps we should keep in mind that the difference between a scientist and an engineer is not so much the training, the educational background, the degrees collected, as it is the attitude toward knowledge. The true scientist finds his supreme satisfaction in the discovery of new knowledge, in the search for a connecting structure of theory which establishes relations,[9] preferably quantitative, between observed phenomena. A classical example is Heinrich Hertz who demonstrated the existence of electromagnetic waves but in no way worried about patents or the applicability to wireless communications. The true engineer, on the other hand, places a value upon knowledge in terms of its usefulness and applicability to the solution of problems posed by man's desires, wants or needs. He will carry on research of a fundamental nature if it contributes to a better or more economic solution of a problem, or in order to assemble data which might be needed for design purposes. A classical example is the invention of feedback [10] for a specific purpose, namely the stabilization of amplifiers and establishing with it a basic principle which has, in fact, made feasible the whole scope of modern control system synthesis.[11]

What are now the implications for Modern Engineering Education? What lessons should we have learned in these last 25 years? It might be presumptive to state what must be personal opinions in the face of the various surveys and studies that have been and are being conducted concerning engineering education, particularly the present large-scale effort under the motto "Goals of Engineering Education." Yet, these studies will by necessity either terminate in a recital of practices which are continually changing, or in recommendations that must be broad enough to cover a substantial number of situations so that a more personal approach might not be amiss.

The first conclusion one is practically forced to put down is this emphasis upon remarriage of science and engineering. In fact, it should be practically unthinkable to have a school of engineering without either including or having in very close proximity strong and preferably leading departments in the basic sciences, mathematics, physics, and chemistry. But even further, beyond these basic sciences which traditionally have furnished "service courses" to the engineering departments, we must now project close proximity of and strong mutual interaction with, departments of life sciences, principally molecular biology and neuro electronics (or experimental psychology or physioneurology), of social sciences, economics and of behavioral sciences. The increasing responsibility of engineers within our society structure, in rendering national decisions growing out of the interaction of technology with the socio-politico-economical sphere, clearly dictate that the young engineering student be at least aware of these fields of human endeavor and preferably that he have a reasonable exposure to them. Within a large university organization these opportunities do indeed exist, except that the student generally is not overly encouraged and that too often the departments in other "schools" are not too receptive because of their more direct concern for the students majoring in their fields. It is for this reason that the concept of the emerging *Technological University* has such outstanding merit and one can point to the Massachusetts Institute of Technology as a world renowned example which was ready to be lifted into this position as a direct result of its leading role during World War II. But we need other similar, not necessarily equally large centers of real modern engineering education throughout this nation.

From the fact that engineering graduates will have to accept much broader responsibilities and therefore will need these extra-disciplinary contacts, it follows that the undergraduate program of four years must be restructured so as to provide more of a general education with emphasis upon basic sciences and engineering,[12] rather than education for immediate usefulness in a particular discipline. One might argue that the only solution is the extension of the undergraduate program to five or even six years. But in most institutions where this has been done, the real objectives have not been achieved. No, it is not necessary to go beyond the four years in undergraduate education. If we look at our alumni today, we find that less than half of the graduates are really using the professional subjects with the intensity with which we like to teach them. It has become rather desirable, and we should hope it to become a prevalent practice, to have all those with direct inclination toward engineering, development, design, and research continue at least a fifth year for the Master's degree which could be taken as a basis for the licensure as professional engineer. We should still, I feel, retain the accreditation by ECPD of the strong four-year programs even if the professional stem has been diffused. The strong tendency toward reorganizing the traditional disciplines if not by the creation of new departments but by interdepartmental programs is a most desirable step toward emphasis upon engineering as a broad profession and considering the more specific concentration as of secondary importance.

The provision of more general undergraduate curricula, or contraction into a single engineering curriculum with a number of concentrations or majors will then also permit the engineering graduate to select advanced degrees in any other professional field, such as management, finance, law, and others thus leading to a very much larger number of potential leaders with sufficient technical background to realize the impact of technology and the need for sound and competent technical advice in so many of the major decisions today.

The increasing complexity of technological society has demand-

(Continued on next page)

[4] Radiation Laboratory Series, Mass. Inst. of Technology, 28 volumes published by McGraw-Hill Book Co., New York, N.Y., 1946-1952.

[5] "Stabilized Feedback Amplifiers," H. S. Black, Electr. Eng. *53*, p. 114, 1934. Also Bell System Techn., *14*, pp. 1-18, 1934.

[6] 'Theory of Servomechanisms, Franklin Institute Journal, *218*, pp. 279-331, 1934.

[7] "Electrons and Holes in Semiconductors," W. Shockley, D. Van Nostrand Co., New York, 1950.

[8] "Technology and the Academies," Eric Ashby, Macmillan, London, 1959.

[9] "Essays of a Humanist," Sir Julian Huxley, Harper & Row, New York, p. 99, 1964.

[10] 'Stabilized Feedback Amplifiers," H. S. Black, U.S. Patent No. 2,102,671.

[11] "Automatic Feedback Control System Synthesis," J. G. Truxal, McGraw-Hill, New York, 1955.

[12] "Technological Challenges to Educating Engineers," E. Weber, IEEE Spectrum, *1*, pp. 119-120, Oct. 1964.

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ed on the one hand strong emphasis upon doctoral study in engineering under the assumption that creative contributions most likely might come from this group and on the other hand on increasing supply of technicians and engineering aids. Doctoral study in engineering must be directed either toward creative design as an original contribution in the field of interest and concentrated study, or toward research as an exposure to experimental or theoretical methodology. More and more, exposure to and participation in problems transcending the accustomed engineering disciplines should be encouraged. The need for technicians and engineering aids is self evident and points to the importance of the vocational programs at junior colleges. We need to make certain that appropriate recognition is accorded to college study short of the Bachelor's degree. Democratic society must have the whole broad spectrum of services with appropriate dignity throughout the wide diversity of abilities.

Finally, the increasing pace of technological change imposes upon the individuals, the employers, and the universities an obligation to carry on and to make possible continuing professional studies. The rate of scientific and technological advance is itself subject to the feedback principle, but in this case not the degenerative and stabilizing kind but rather the positive, regenerative kind that feeds on what it has produced and thus accelerates the advancement. To just keep up broadly requires a superior mind, to make creative contributions takes outstanding abilities, but the multitude must keep in step at least in their narrower field in order to remain technologically useful. This imposes upon universities a new dimension of educational responsibility different from the normal academic classroom and laboratory commitments. It does mean a different organization of the material, a different approach in the exposition of concepts and a different choice of illustrative material. The recognition of this academic responsibility is rather new, it is not to be confused with the time-honored extension programs, though it might be identified as a new phase of these inasmuch as it does not have the objectives of attaining advanced degrees. Inasmuch as close to 90% of all engineering manpower is employed in industry and by government, the prevention of "technological obsolescence" must be resolved by a joint action of industry and government with universities at least in the areas of basic studies and methodology. The scope of this problem is an ever-growing one that has been recognized in some of the older major professions but is now upon us with great severity.

Indeed, the concept of modern engineering education does project an enlargement of scope appropriate to a Technological University. Obviously the realization can be expected only where the required growth potential is latent and can be marshalled. For engineering schools within university structures this will demand a considerable and conscious intensification of good relations with those school units that can furnish the supplementary extradisciplinary offerings. But it is not just organization that needs to be adapted to the larger mission, it is, in fact, most important to select an appropriate faculty particularly in the non-technical areas. For example, the more or less classical approaches to social and behavioral sciences practiced in many schools of liberal arts will relate little to the positive interpretation of the interaction between technology and society that could really be helpful to engineering students. The transition from the pre-occupation with the quantitatively predictable inanimate materials, forces, and processes of nature to inclusion of the complexity of biological systems with attitudes, behavior patterns and reflective reactions presents an enormous task. The faculty necessary for the successful implementation hardly exists today and needs to be cultivated.

Could one argue: Perhaps the expectations are unrealistic, the attraction of engineering to students just is this pre-occupation with inanimate nature, the design and construction of devices and machines that can disregard life and its consequences? If one were to accept this argument, then engineering would remain essentially a craft, a skill of high order, it would not grow into a true profession. As emphasized by J. Douglas Brown, economist and Dean of Faculty at Princeton University:[13]

> "The central attribute of a learned profession is thus responsibility, not for a segmented detail of a total problem, but for an effective solution of the total problem. This means for the profession of engineering that the days are past when each specialist can withdraw into his specialty and become a servant of someone else's grand design. Rather, the professional engineer must assume the initiative in helping to solve problems which in the past have been shrugged off as political, economic, or social."

[13] "The Role of Engineering as a Learned Profession," J. Douglas Brown, in Report on Conference on Engineering Education, Princeton University, p. 45, Princeton University Press, 1963.

YOUNG ELECTRICAL ENGINEER AWARD DINNER

EDWARD W. MARKARD, Chairman

On Monday, March 22, 1965, the annual Eta Kappa Nu Award Dinner was held in the pleasant atmosphere of the Belmont Plaza Hotel in New York City. The award of Outstanding Young Electrical Engineer of 1964 was presented to Dr. W. Lee Shevel, Jr., of the IBM Watson Research Laboratory "by virtue of his excellence in the research of magnetism, memory and materials for the advancement of computer sciences, his demonstrated managerial abilities, and his high devotion to the work of the Church."

Honorable Mention Awards were presented to Paul Dragoumis of American Electric Power Service Company and Frank S. Vigliante of the Bell Telephone Laboratories. Serving as toastmaster was Dr. R. J. W. Koopman, National President of Eta Kappa Nu. The principal address entitled "Changing Relationships In Science and Engineering" was delivered by Dr. E. R. Piore, Vice President and Group Executive of IBM Corporation.

The New York Alumni Chapter of Eta Kappa Nu assisted in making the arrangements for this highly successful event which was attended by 150 Eta Kappa Nu members and guests.

L to R — Eta Kappa Nu President Richard Koopman holding the Award Bowl, Paul Dragoumis, W. Lee Shevel, Jr., E. R. Piore, and Frank S. Vigliante.

CHANGING RELATIONSHIPS IN SCIENCE AND ENGINEERING

DR. E. R. PIORE, VICE PRESIDENT, INTERNATIONAL BUSINESS MACHINES

The following address was delivered at the Eta Kappa Nu Outstanding Young Electrical Engineer Award dinner held at the Belmont Plaza Hotel in New York City, March 22, 1965

Dr. Koopman, Lee Shevel, Paul Dragoumis, Frank Vigliante, ladies and gentlemen: It is a great pleasure to be asked to talk to you this evening and it was a real privilege to serve on the final panel that selected tonight's winners.

This is a very significant award. It is significant as one looks over the past recipients and sees where they are now. It indicates how wise Eta Kappa Nu has been to select really the best young engineers, and sort of predict their future. Let me just tick off the names of people I personally know, and my experience isn't infinite. They are all honored as engineers, although Lee Shevel questions what engineering work one or two have done, but I'm not going to take the time of this audience to teach Lee Shevel a thing or two. You have Guy Suits, Vice-President of General Electric. You have Winnie Kock, who will head the new NASA Electronics Laboratory in the Boston area. Those who get the prime award and honorable mention average out with time. You have Don Fink who runs all of us professionally. You have Si Ramo, who is President of Thompson Ramo Wooldridge. You've got John Pierce, one of the great intellects in American engineering and I guess one of the prime movers in information theory. You have Dave Smith, former Vice President of Philco. You have Jim McRae, who unfortunately died very prematurely. Mr. Dudley Buck has been mentioned. You have Jack Morton, Vice President of Bell Labs. You've got Jerry Wiesner, who was adviser to the President and is now Dean of Science at MIT. The people chosen more recently still have to prove themselves, except Rube Mettler, who is President of Space Technology Labs, and Ed David who, the same year, got honorable mention.

Now, let me be very brief. It may sound as though I throw out a lot of slogans, but I want to get ideas across. I know some of you ladies may not be quite interested, but we'll do our best. People forget that contemporary science can survive only in a highly industrialized society. It feeds on industry, and industry feeds on science. Engineering these days leans heavily on science and cannot prosper without it. Historically, this relation has not always prevailed. We find historically that both science and engineering blossomed at the same time in an unrelated fashion, and the common sort of cement that made them blossom together, basically, was commerce. It wasn't the Renaissance, but the commercial revolution associated with the Renaissance that created contemporary science and engineering.

Let me go back a little bit. One of our great scientific types was Joseph Henry. I think he was the first president of the National Academy of Sciences and scientific adviser to Abraham Lincoln! Let me indicate the problems he dealt with when he was in Albany, New York. He got involved in electro-magnetic induction. He had copper wire and spent most of his time putting cotton around it to insulate it to get some magnets. Now most of you are not old enough to remember how you used to strip that cotton off the copper wire to make connections. This was a very simple-minded relation between science and technology. As one looks at contemporary science and engineering it is easy to observe that they have common roots. The very titles of the courses at our academic institutions indicate the common heritage of these two professions. They differ in the goal each profession sets for itself. They differ in the attitude of attacking the problem. They differ in the judgment of success. They differ on when they feel they have put the problem to bed. The scientist has a discipline before him, a structure that has been built by the human mind. He tries to fit things into this structure, test it, shake it.

In contrast the engineer must meet the needs of our society. He must make things work. Getting greater understanding is of secondary importance. The best of science is found in our academic institutions, although half of the current contributions to science do come from outside the academic institutions.

In contrast, the great revolutions in engineering did not occur in our colleges, but in industrial, government, and non-profit laboratories.

The engineering curriculum follows these revolutions. We have a prize winner on non-conventional power. This did not appear in any engineering curriculum. It occurred in industry and in AEC labs. You have a similar situation in the whole re-entry problem of the ballistic missiles. The great problems were solved in industrial labs and then the colleges took up a curriculum. You could have the same problem with solid state electronics—the transistor is a classic example. There's great to-do about the engineering aspects of quantum electrodynamics.

The three gentlemen we are recognizing and honoring tonight have contributed in the areas of power, computers, and magnetic materials. They have contributed on their own initiative. They didn't contribute on what basically was taught to them by their professors. I'm exaggerating things, but these are the realities of a technological revolution. This is due to the great acceleration that is occurring in our technological development. Our society has acquired an insatiable appetite for new technology, new equipment, new processes, new procedure. Industry has been wrestling with systems concepts, an area in which one of our recipients has made a name for himself. Our schools recently have finally decided to inject curricula dealing with systems. Thus the attributes imperative to survival for a continued production of contemporary engineers is intellectual mobility and growth. These three young men have displayed and show promise that they will maintain this attribute as they grow older.

You find, as you look at their biographies, none of them had courses that taught them the things they are doing now. They are the pioneers. As a consequence of this requirement of intellectual growth and flexibility, we find that the engineering schools have faced the problem by stressing fundamentals and eliminating courses that teach the state of the art or routine technology. This accelerated technological growth in our society requires two kinds of mobility—intellectual and geographic. I am talking to Mrs. Vigliante, since they are going to move. This is part of life; this mobility involves both science and engineering.

One day a man is a scientist, the next day he's an engineer. If one looks at the Nobel Laureates, and this is what many people forget, many of them got Nobel Prizes basically for engineering achievement. Donald A. Glaser got a Nobel Prize for inventing a bubble chamber, and to indicate his intellectual mobility, he left

(Continued on next page)

PIORE (from page 11)

physics and went on to biology. Ed McMillan got a Nobel Prize for inventing an accelerating machine. If you look through the years that Nobel Prizes were awarded, one is astonished how often they have been awarded for a device.

The growth of research laboratories in industry has provided the mobility between science and engineering, and this is one new element in our lives. Scientists are hired to staff these research laboratories and one finds that some of them drift into engineering. Some of them drift with a whip on their backs, others go there enthusiastically. The converse is always true. One finds that the engineers transfer to the research activities to catch up with what is occurring in science and to make some significant contributions.

The coupling between science and engineering is also occurring in the university type of operation and we forget about this aspect of engineering. This is due to the increased need of well-engineered equipment in our scientific laboratories. The very large accelerators are great creations of engineers and were built by engineers. The great new radio-astronomical observatories, again, are great engineering creations, created by engineers. The people who design and build the equipment don't use it.

These examples typify contemporary life in the scientific and engineering laboratories: more measurements, greater need for instrumentation, and greater mechanization of our laboratories to reduce laborious routine processes. This is occurring both in the scientific labs and engineering labs. Much of it is due to the fact that computers have been made available and they do a certain amount of the routine engineering that has been much of the curriculum of the past in our engineering schools.

If you look at the transportation problem, it is a great systems problem under study at the moment. We are in a revolution technologically, scientifically, and engineeringwise. Things are moving rapidly and the great requirement is intellectual mobility to survive and to continue to contribute to our society. These three award winners are a symbol of this. More than a symbol, they have demonstrated their ability for performance. We salute you as engineers. Let me call myself an engineer and salute you gentlemen.

Now let me take a moment and introduce the recipient of the award.

Dr. W. Lee Shevel, Jr., is very young. He's 32 and he is very fortunate. Since joining IBM he has continued to work on magnetic materials. Magnetic materials in the past have been sort of the basis of the memory devices that are used in the computer industry. To indicate his great intellectual mobility, he has expanded his area of interest from just magnetic materials to be concerned with large magnetic storage devices. This includes more than magnetic materials. It includes the whole problem of circuits, drivings, logic, sensing, amplifiers, and so forth.

He has made a contribution to electrochemistry and also in polymer materials. This indicates that he is sort of a universal man. He got all his degrees at the Carnegie Institute of Technology. He did graduate work while he was working and raising a family, and his wife and four lovely daughters have been alluded to. At present he is manager of Magnetism Memory and Material Research at the IBM Watson Research Center. Needless to say he has been very active in church affairs. He has been a member of the Board of Trustees and sings in the church choir. He has also found time, which is very important, to pass what he's learned on to younger people. He has left occasionally late at night to go to teach at college and come back two days later, exhausted but sort of gratified that he has passed this tradition on to younger people.

"He's been going with that kook ever since he made Eta Kappa Nu."

Reprinted from IEEE Student Journal

Gamma Theta Chapter Installs NEW SCHOLARSHIP PROGRAM

Gamma-Theta Chapter of Eta Kappa Nu, at the University of Missouri at Rolla (formerly the Missouri School of Mines), has recently installed a scholarship program to assist qualified students to complete their educations.

The conditions of the scholarships are as follow:

(a) The scholarships are known as the Eta Kappa Nu, Gamma-Theta Chapter Scholarships.

(b) One or more scholarships in the amount of $200.00 each are awarded annually, provided that sufficient funds are available.

(c) Selection of the recipient(s) is made by a faculty scholarship committee of the University of Missouri at Rolla, of which at least one member must also be a faculty member of the Electrical Engineering Department. The recipient must be either a junior or a senior student in good standing, enrolled in the department of Electrical Engineering, University of Missouri at Rolla. The recipient is selected on the basis of scholarship and need.

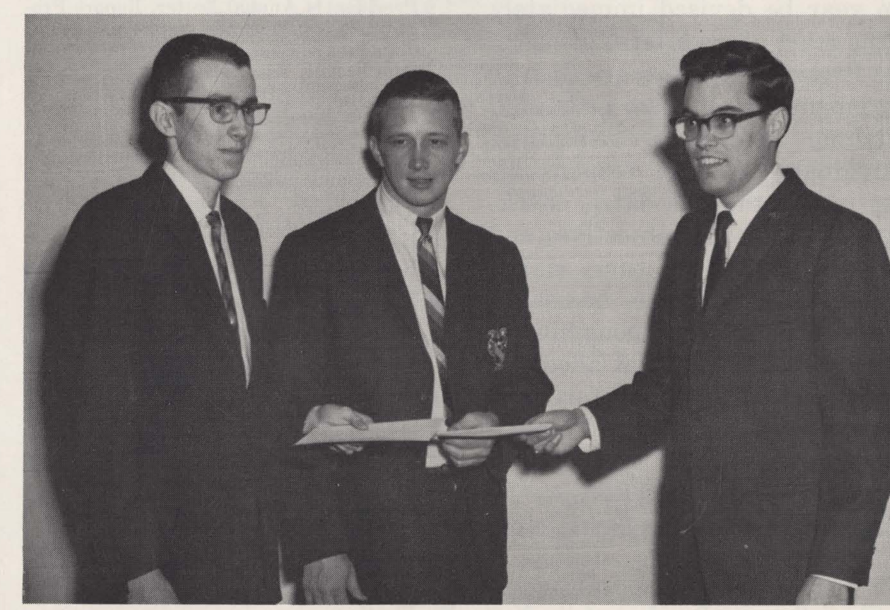
(d) The scholarships are funded by the treasury of Gamma-Theta Chapter of Eta Kappa Nu Association. The faculty committee is notified within one month after the start of each semester as to the number of scholarships to be awarded.

(e) The recipient is notified of his selection by the faculty committee and receives the award at the first Eta Kappa Nu banquet following his selection.

The funds for the scholarships are obtained from laboratory insurance sales.

The first two scholarships were awarded at the banquet on January 9, 1965, to Gary D. Brunner, a senior from Springfield, Missouri, and Donald E. Watke, a junior from Kansas City, Missouri. Both recipients were well chosen. Brother Watke was also honored with the Outstanding Pledge Award.

Gamma-Theta Chapter feels fortunate to be able to help worthy students in this manner and hopes the project will have as much success in the future as it has thus far. We feel confident that it will.



Donald Spirk, President of Gamma Theta Chapter at UMR, presents scholarship checks to Gary Brunner and Donald Watke.
L. to R. — Donald Watke, Gary Brunner, Donald Spirk.

A Typical Plan For An ALUMNI CHAPTER PRESIDENT

by
BERTHOLD SHEFFIELD*
Radio Corporation of America

One of the difficulties facing an incoming president of an alumni chapter is the establishment of an annual agenda. We have found it useful to establish a calendar of duties and goals with associated implementation dates. A typical calendar is shown below. It is being reported in the hope that it may interest and serve other chapters.

As a result of our experience at the helm we learned to apply several important management techniques, as follows. It is essential to the success of a chapter that a program and calendar for the entire year be devised immediately at the start of each term of office. The President's duties are then to implement the program promptly, watching the dates, reminding individuals of their responsibilities before the due dates, checking personally that objectives and goal are fulfilled on time, standing by to help whenever necessary in order to meet responsibilities promptly, ensuring that adequate publicity is prepared before and after every event. The President's principal duties are summarized by the acronym PATRIA — he must *P*lan *A*genda, *T*ickle (officers and committees), *R*emind (responsible parties), *I*nform (members and public), *A*ct (where necessary).

HKN—New York Alumni Chapter
TENTATIVE CALENDAR
(Modified 5-25-65)
(By Berthold Sheffield)

1. May
   a. Establish Program and Calendar
   b. Check finances
   c. Prepare mailing list; inform non-contributors of cut-off date
   d. Study constitution
2. May/June
   Organize Summer Employment Program
3. Aug. 15-Nov. 30
   Annual College Chapter Report Award Judging
4. September
   President's Annual Letter. Report Program. Request funds, support; remind delinquents Sept. will be cut-off date.
5. Sept.-Oct.
   Plan Award Dinner
   a. Plan hotel location
   b. Organize work plan—assign jobs
   c. Plan publicity campaign, contact IEEE and publishers for space
6. September
   Plan Regional Meeting
7. October
   Request Council Meeting, organize it, present progress report
8. November
   Regional Meeting
9. December 10
   Awards to winning college chapters
10. January
   National—visitation to New York—plans
11. February
   Obtain names of new alumni from New York College chapters
12. March
   Award Dinner
13. April
   Nominations—new officers
14. May
   Elections
15. May
   Introduce new officers, program to Alumni Council Meeting

* The author was President of the New York Alumni Chapter of HKN (1963-1964) and is now serving as Chairman of the Alumni Council of HKN.

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the most inappropriate time? And you say to yourself "I was mistaken about that problem. I didn't have it as well solved as I thought I did." Well now does it make sense that you could always be wrong on something like this? Of course not! The truth is you did have the problem solved properly but your failure to worry about it anyway caused it to go wrong. It is absolutely necessary to worry about things even when they are properly taken care of.

Any Dean will tell you that the students who have the most worried looks on their faces are the ones who make the best grades. This is not because they are smarter or harder working but just because they worry a lot. The students who don't have a care in the world usually flunk out, but only because they didn't worry about anything.

Obviously then, worrying in itself is a powerful tool for doing good as well as for preventing evil. It is most regrettable that so few people are aware of this. Most people worry haphazardly instead of setting up formal programs of concentrated worry. Also they are so poorly trained in the basic techniques that they must worry at least two hours to get the full benefit of one. The art and science of worrying should be taught in the schools as a regular discipline. This is the only way we will ever be able to beat Castro. Is there anyone who wants to disagree with that?

Worry could be taught in almost any college of the university, but if it is to be taught for the benefit of mankind its proper place is in the College of Engineering. There practical courses and laboratories could be offered that would teach effective pro-

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New York Alumni Chapter News

By Irving Engelson
N.Y. Alumni Bridge Correspondent

As we prepare for a successful summer, it is natural to reflect on the accomplishments of the past six months.

During the first half of 1965 the HKN New York Alumni Advisory Council met twice. The Advisory Council is composed of all past presidents and vice presidents of the New York Alumni Chapter, all past and present national officers and all present officers of the New York Alumni Chapter. The Advisory Council is chaired by the junior past president of the N.Y. Alumni, this year Berthold Sheffield, who has done an excellent job, as usual.

National Headquarters was represented by Howard H. Sheppard, vice president, and Dr. Octavio M. Salati, National Director. The national representatives stressed the importance of life membership subscriptions to *The Bridge* and other important matters.

Daniel Douglas, president of the New York Alumni Chapter reported on the plans of the future which included meetings with industry regarding continued training, and suggestions on how new graduates can keep the profession strong and vigorous.

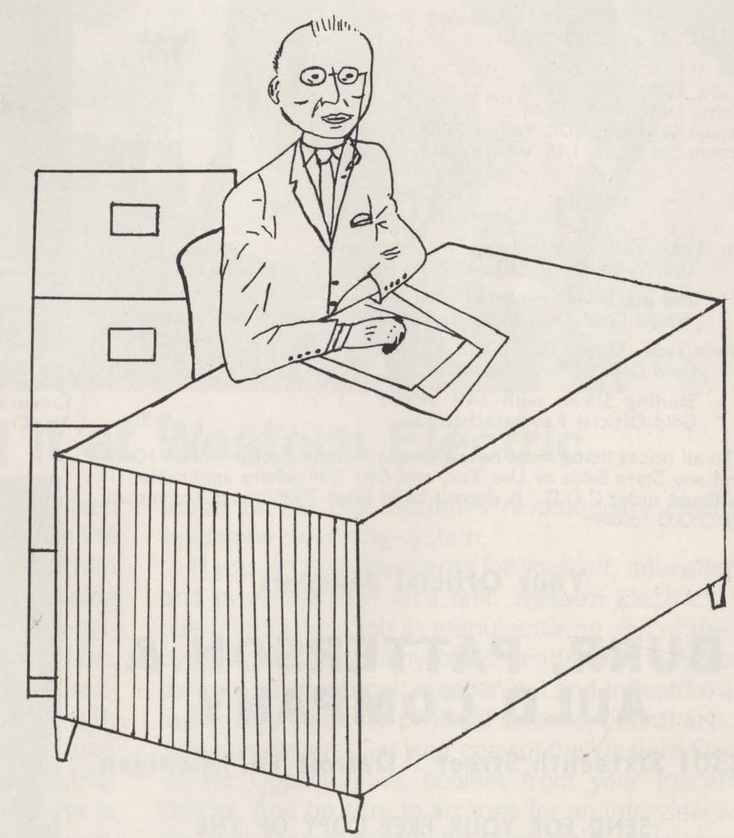
At the end of the meeting the group was addressed by Mr. Donald C. Cook, president of American Electric Company. Readers of *The Bridge* will remember Mr. Cook as the man who was asked by President Johnson to consider the position of Secretary of the U.S. Treasury. Mr. Cook congratulated the group for their fine efforts and achievements. He stressed the importance of the pursuit of excellence.

N.Y. Alumni to Publish Handbook

At the Advisory Council Meetings, at the suggestion of Berthold Sheffield, it was decided that the "Handbook of Information" be updated, published and distributed. This "Handbook," which was prepared by Larry Dwon in 1944, contains an historical account of the N.Y. Alumni Chapter from 1914 through 1944. Larry Dwon was appointed Editor. The Council also adopted the number of resolutions ranging from finding summer employment for HKN students to more actively participating in joint college-alumni undertakings.

Richard F. Schwartz Receives Distinguished Teaching Award

Dr. Richard F. Schwartz (Beta Nu '42), Associate Professor of Electrical Engineering at the Moore School of Electrical Engineering, University of Pennsylvania, is a recipient of the Christian R. and Mary F. Lindback Foundation Award for Distinguished Teaching at the University. The award is given annually to several faculty members who have distinguished themselves in their attention to good teaching and consists of a sum of money and a citation.



THE OLD PROFESSOR SAYS: Thomas Edison thought that genius was one percent inspiration and ninety-nine percent perspiration. I certainly hope that explains why there is so little inspiration and so much ventilation around here.

REAL & IMAGINARY (from page 14)

cedures that could be applied immediately upon graduation, or before. When the curriculum is first established there might not be enough courses in worry to fill up a full four-year degree program. This is no problem though, as there could be added such courses as Surveying (which would teach how to worry in two dimensions), Descriptive Geometry (which would teach how to worry in three dimensions), and Wood Turning (which would teach how to worry about revolutions).

It should be pointed out that worry can be a powerful tool for private profit. If you worry about your stocks and do it in a professional way with lots of finesse, they are certain to go up. Also if you bet on the races you should pick the horse with the most worried look on his face. Of course this may not be foolproof as he might not be worrying as much about the race as perhaps the moldy oats he has been getting for breakfast or the fact that he is having trouble with his love life.

But you say, that's all well and good, but doesn't a lot of worry foul up our plugs? Doesn't worry give us Tennis Elbow and a lot of other dreadful things? Well, it can—but a systematic program of worrying about it would prevent it from happening. P.K.H.

Ford Motor Company is:

challenge

Dale Anderson
B.A., Wittenberg University

At many companies the opportunity to work on challenging projects comes after many years of apprenticeship and a few grey hairs. Not so at Ford Motor Company where your twenties can be a stimulating period. There are opportunities to prove your worth early in your career. Dale Anderson's experience is a case in point.

After receiving his B.A. in Physics in June, 1962, Dale joined our College Graduate Program and was assigned to our Research Laboratories. Recently he was given the responsibility for correcting cab vibration occurring on a particular type of truck. His studies showed that tire eccentricity was the cause of the trouble. Since little change could be effected in tire compliance, his solution lay in redesigning the suspension system. Tests of this experimental system show the problem to be reduced to an insignificant level.

That's typical of the kind of meaningful assignments given to employes while still in the College Graduate Program—regardless of their career interest. No "make work" superficial jobs. And, besides offering the opportunity to work on important problems demanding fresh solutions, we offer good salaries, a highly professional atmosphere and the proximity to leading universities.

Discover the rewarding opportunity Ford Motor Company may have for you. How? Simply schedule an interview with our representative when he visits your campus or write our College Recruiting Department. Let your twenties be a challenging and rewarding time.

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