A New Image in Professional Education



By JACK D. ARMOLD, Ph.D. Director, Prosthetic-Orthotic Education Assistant Professor in Orthopedic Surgery Northwestern University Medical School

The Wall Street Journal carried the following headline on July 18, 1962, concerning a changing image in the field of higher education: AGRICUL-TURE COLLEGES SHED HAYSEED IMAGE.¹ Through a combination of advances in agriculture and business procedures the "old cow college ain't what it used to be." The colleges are striving to overcome the notion that agriculture is a dying industry with few opportunities for young people. The new air of vitality and growth in "agribusiness" has attracted many young men from the urban areas.

Other images are changing in colleges and universities. For example, the changes in medical education have been many. Dr. Leslie B. Arey, in his book commemorating the 1859-1959 Centennial of the Northwestern University Medical School remarked that Dr. Nathan Smith Davis, the founder of the School, could never have envisaged the rapid development of medical education in this century.²

Historically the universities have been recognized as the institutions organized for students pursuing higher degrees in the traditional fields of theology, law, medicine, and the arts. However, greater specialization in the modern world and new student needs have introduced new curricula into the new universities. A special group of students now take evening courses and post-graduate courses on a part-time basis with no degree in view.

Caught up in the "education explosion," Northwestern is indeed changing. Fittingly, many of these changes directly involve the faculty. The traditional image of the university instructor has been modified. The typical university instructor has been characterized as a full-time teacher who was an "academic man." He allegedly had little concern with practicalities. He conducted his class at a leisurely pace. Time permitted such flexibility of procedure. Today, many instructors are practicing on a full-time basis but teach their specialties at the universities on a part-time basis. Students, who are practicing in businesses and professions, must receive the greatest amount of information in the shortest possible time. Efficient and effective teaching means must be employed.

The "new image in professional education," then, provides instruction

¹ Wall Street Journal, July 18, 1962, p. 1.

² Arey, Leslie B., Northwestern University Medical School, 1859-1959, Evanston and Chicago, 1959, p. 461.

for students, who, for professional, social, or economic reasons, cannot attend the university classrooms as regular students. Recognizing their special training needs, the instructor, who is a specialist in his field, engages in a highly specialized and efficient curriculum in an attempt to meet the demands of his students. These students, instructors, and curricula best characterize Prosthetic-Orthotic Education at Northwestern University.

The purpose of this article is to identify, analyze, and evaluate some particulars in this educational program, a comparatively new development in the University. The attempt to achieve our objective will be made through the following organization: (1) Philosophy, (2) Students, (3) Faculty, (4) Curriculum, (5) Extra-University Activities, and (6) Perspective.

Philosophy

"Why?" the eternal question of philosophy, explores reasons, causes, or purposes. Historical reasons for the development of the prosthetic-orthotic programs at the three Universities have been given in the preceding article by Dr. Clinton L. Compere. Reasons for the departure from the traditional practices in universities in the United States may be traced back to the last century. In 1890, many prominent educators met in Philadelphia at the American Society for the Extension of University Teaching. This marked the beginning of adult extension teaching in higher education in the United States. Dr. William Rainey Harper, the first president of the University of Chicago, led in this development. To make no effort in the direction of a wide diffusion of knowledge, he wrote in 1892, would be "to neglect a promising opportunity for building up the university itself, and at the same time to fall short of performing a duty which . . . is incumbent upon the university.3

Northwestern University, seven decades later, following the examples of the University of California at Los Angeles and New York University, recognized the needs of students working with the disabled and also of promising opportunity for service. Dr. Richard H. Young, Dean of the Medical School, wrote:

Northwestern University Medical School recognizes that courses offered in Prosthetic-Orthotic Education fulfill a need by providing the rehabilitation field with trained personnel. The facilities and knowledge of the University are available to aid students in gaining a better understanding of philosophy and techniques, to provide sources for research, and to improve communications and working relationships among professional groups concerned with rehabilitation of the physically handicapped.⁴

The key objective of this program is to improve services to the disabled. The University can best meet the service objective through education and research.

The wide dissemination of knowledge in prosthetics and orthotics makes a major contribution in the prevention and treatment of disabling conditions. The University is the logical institution for training persons wishing to make this contribution. Professional publications and meetings will always be necessary for better care and improved inter-disciplinary cooperation, but the University has the best available means for communicating priniciples and techniques. The classroom is most conducive to learning. The form and spirit of learning is under the direction of men knowledgeable in their fields and skilled in teaching.

This post-graduate program seeks to be equal in quality and quantity to that done in the University proper. The training must be systematic in form

³William Rainey Harper, Bulletin #6, May, 1892. Unpublished works in William Rainey Harper Library, University of Chicago. ⁴Richard H. Young, Personal Communication, August 1, 1962.

and scientific in spirit, and, to be such, it must be done under the direction of university men who have had scientific training. While we have spoken of the "new image," we have thought of it more as an extension of the essence of the University rather than a departure from its essence.

"Putting research findings into service," Miss Cecile Hillyer, Chief, Division of Training, commented, "is the major objective of training grants from the Office of Vocational Rehabilitation." ⁵ Effective teaching must be supported by sound research. The obligation of advancing present knowledge through investigation is a fundamental concept in any university organization. This program has benefited greatly by research and development efforts of the Northwestern University Prosthetic Research Centre and the other prosthetic and orthotic research projects throughout the country.

The growth of expensively financed research and training programs within medical schools has been accelerated to breath-taking speeds. Consequently, the demands for medical subsidies have grown and will probably continue to grow. There can be no question about the fact that the increased availability of federal funds for research and training has greatly improved the care of the disabled. Dr. Herbert Talbot said: "For just as the chief function of government is to secure the lives and prerogatives of individuals, so it must be the aim of federal medicine to support and supplement individual and community practice." ⁶ The following discussion of this educational program will show ways in which private-federal planning and funding have improved services to the disabled by training more than twelve hundred rehabilitation personnel in prosthetics and orthotics.

Students

Where does the instructor begin? Does he begin where the student *is* in knowledge and skills, or where he thinks the student *ought* to be? The instructor here is dealing with the reality of student ability and his own expectations for student accomplishment. This problem is made more complex

when the teacher instructs one group of students with strong backgrounds in formal education and, at the same time, teaches another group of students with great resources of practical knowledge. For instance, all of the physicians, therapists and counselors in our courses are college graduates. Here we have strength in formal education. The majority of prosthetists are only high school graduates, but they have often had many years of experience which makes them quite knowledgeable in the prosthetic and orthotic fields. The non-prosthetist groups usually have little experience with or knowledge of these fields.

The combined efforts of each member of the clinic team are indispens-



FIGURE 1—A student prosthetist at work in the laboratory.

able to providing the necessary and desirable prosthetic and orthotic serv-

⁵ Hillyer, Cecile. Upper-Extremities Prosthetics Workshop, July 5-8, 1960, Conference Report Minutes, Los Angeles, 1960, p. 3. ⁶ Talbot, Herbert S., "A Concept of Rehabilitation," Rehabilitation Literature, XXXI

^o Talbot, Herbert S., "A Concept of Rehabilitation," *Rehabilitation Literature*, XXXI (December, 1961), 358.

ices. The interdisciplinary approach, with its inherent difficulties in backgrounds, skills, and special interests, seems to be the most satisfactory approach to rehabilitation training. A desire to give better service to patients is the basic motivation of all students. A physician wrote that he intended to utilize the principles taught in the course to aid the amputee "in assuming as normal and useful a place in society as possible, as early as possible, and with a minimum of physical and mental trauma." A therapist wished "to prepare herself better to help the amputee in her community to use his prosthesis to his maximum ability." A prosthetist regarded his training as a "continuation in the work of his choice to rehabilitate people of all walks of life in need of his services." A counselor wished to improve his technical knowledge in the area of prosthetics and orthotics, and to apply this knowledge to the process of rehabilitation counseling.

	TABLE A:	COURSE ENRO	OLLMENT	
	59-60	60-61	61-62	Total
Prosthetists	76-23%	80-18%	79-18%	235-20%
Therapists	97-29%	140-31%	115-27%	352-29%
Physicians	88-27%	141-31%	128-30%	357-29%
Counselors	71-21%	74 17%	105 - 25%	259-21%
Others	0-0 %	11-3%	0-0%	11-1%
TOTAL:	332-100%	446-110%	427-100%	1214-100%

This table shows the total number of students by course enrollment. It does not show the number of actual students. (See Table B). The Others category includes administrators and observers. Several points may be made about Table A: (1) The total percentages of the first four groups are in the 20% range, which indicates a fairly equal distribution; (2) The decrease of 20 students last year as compared to the previous year is due to two reasons: (a) twenty-five courses were scheduled last year as compared to twenty seven the previous year, and (b) the cancellation of the pilot course in spinal orthotics, due to the lack of funds, reduced the expected enrollment by thirty students; and (3) The policy of limiting the number of students because of limited physical facilities has kept the enrollment fairly constant during the last two years.

The increase of counselors in 1961-1962 to an average of twenty five per class from eighteen seemed to be desirable. This change of policy caused an 8% increase in counselors during the past two years.

TABLE B: ACTUAL STUDENT ENROLLMENT Prosthetists 177-18%

111-10%
280-28%
281 - 28%
259-25%
11-1%

1008-100%

This table shows the number of different students who have attended one or more courses. The physicians and therapists groups constitute the largest groups of students because they average sixteen students for each class. The average class-laboratory size of prosthetists is twelve. The class-size factor provides a valid comparison, because all three of these groups have had twenty courses during the past three years. If the courses continue to have an equal distribution, the actual prosthetist enrollment will continue to be the smallest group. The courselors do not figure in this comparison because they had had only thirteen courses. In comparing Tables A and B in the

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counselors category, one notes that their course enrollment and actual enrollment are the same. Only one course is offered for this group.

TABLE C: PROSTHETISTS—AGES, EDUCATION, CERTIFICATION, DISTRIBUTION

AGES		EDUCATION						
20-29 yrs. 28-16	5%	Element	6-3%					
30-39 yrs. 61-34	1%	Some H	16-9%					
40-49 yrs. 69-39	9%	High S	112-63%					
50-59 yrs. 13-7	70	Some C	29-17%					
60-69 yrs. 3-29	76	College	12-7%					
No Record 3-29	%	No Rec	ord	2-1%				
177-10	00%			177-100%				
CERTIFI	CATION		GEOGRAP.	HICAL				
*Certified in Prosth	etics	95-54%	Mid-West	100-56%				
*Not Certified in Pr	rosthetics	82-46%	South	59-32%				
			West	9-6%				
		177-100%	East	7-5%				
*Included: 14 Certi	fied in Orth	notics also.	2-1%					
*Included: 8 Certi	fied in Orth	otics only.		177-100%				

Our focus in this article is upon the prosthetist and orthotist. Several inferences emerge from these statistics: (1) Age.—On a comparative basis, the age of the prosthetists, approximately 40 years, is average for the postgraduate student. Only the therapists have a large percentage in the younger range of 20-29 years. In all older groups, however, the instructor would expect to find some lack of flexibility in learning, and some predominance of set patterns of behavior and practice. (2) Education-The lack of formal education sets the prosthetists apart from the other groups. The instructor can predict areas of weakness in broad, systematic training in the basic arts and sciences. With older students, however, he may expect some depth in practical knowledge. (3) Certification.—The slightly larger percentage of certified students in prosthetics points out that students have regarded further training as necessary for development in the field. The slightly smaller percentage of certified students in prosthetics probably shows that university training is an essential preparation for the certification examination and service. The lack of courses in orthotics for students certified in orthotics reveals one of the weaknesses of the curriculum. (4) Geographical Distribution.—The prosthetists reflect the regional nature of the school with 56% of prosthetists coming from the Mid-West and 32% from the South. The greatest number come from these States: Illinois, 22-12%; Michigan, 17-10%; Ohio, 14-8%; Wisconsin, 13-7%; Missouri, 12-7%; Tennessee, 10-6%; and Florida, 10-6%.

The geographical distribution of counselors reveals the most regional aspect of the program. The Office of Vocational Rehabilitation has assigned Region V, Region VI, and the States of Louisiana and Oklahoma to this program. The two regions cover the entire Mid-Central United States. Every State Director in this assigned area has sent counselors to Northwestern.

The national and international character of the program is seen in the enrollment distribution of the physicians and therapists. Most of the foreign students are physicians specializing here in orthopedics. The largest distribution of students is found in the juvenile amputee course because it is the only course of this type offered in the country.

The total student distribution includes fourteen foreign countries, the District of Columbia, and forty states. The foreign countries are; United Arab Republic, Egypt and Syria, Lebanon, Israel, Iran, India, Korea, Denmark, France, Germany, Canada, Argentina, Costa Rica, and Chile. The twelve states not represented in the enrollment are: Alaska, Hawaii, Washington, Oregon, Idaho, Nevada, Arizona, Arkansas, Connecticut, Vermont, New Hampshire, and Maine.

Specialization in medicine and therapy, as a factor of enrollment, has always been an item of interest. The following is based upon actual student enrollment:

TABLE D: SPECIALTIES ENROLLMENT

Physical Therapy	Occupational Therapy	Corrective Therapy	Total
228-82%	43-15%	9-3%	280
Orthopedic Surgery 200-71%	PHYSICIANS Physical Medicine 76-27%	No Specialty 5-2%	Total 281

Therapists.-The applications from physical therapists have far exceeded the other two groups of therapists. As will be shown in Table G, this is due to the large physical therapists' majority in the lower-extremity courses where nine such courses have been offered. This is five more than upperextremity courses where the occupational therapists show a more equal distribution. Corrective therapists have always had a very small enrollment. *Physicians.*—Applications from physicians in orthopedic surgery constitute nearly three-fourths of the total physician enrollment at Northwestern. This is in contrast to New York University where "the number of orthopedic surgeons and physiatrists is about evenly divided."7 Of the two hundred students in orthopedic surgery, ninety seven, or 44%, are residents: of the seventy six students in physical medicine, fifteen, or 20%, are residents. One major cause for this high enrollment pattern of orthopedic residents is the excellent cooperation which Northwestern has enjoyed with fourteen Departments of Orthopedic Surgery and three Departments of Physical Medicine and Rehabilitation. This ratio of physicians in orthopedic surgery and physical medicine seems fairly consistent with certification statistics for both groups. Roughly, there are about seven times more orthopedists than physiatrists.

Curriculum

The curriculum, or course of study, has been called a "blueprint of learning." It generally includes didactic instruction, systematic teaching by lecture, and is correlated with practical experience. The latter includes clinical and laboratory experience.

Didactic instruction must go hand-in-hand with clinical correlation and practical experience.⁸ The courses for prosthetists have a greater amount of laboratory time than the other student groups. Approximately 30% of the time is spent in didactic instruction and 70% in laboratory-clinic time. The physicians and therapists receive 55% didactic instruction and 45% practical-clinical experience. Because of the large scope of the counselors' course, which includes both orthotics and prosthetics, 75% of the time includes didactic instruction and only 25% in practical case work-ups and presentations.

⁷ Berger, Norman, "Post-Graduate Training in Prosthetics and Orthotics," Orthopedic and Prosthetic Appliance Journal, September, 1960, 82.

⁸ Arey, op cit., p. 464.



FIGURE 2-Physicians and therapists hear a lecture on biomechanics in the auditorium.

TABLE E: COURSES BY STUDENT GROUPS

	Courses	Percent
Prosthetists	20	27%
Physicians	20	27%
Therapists	20	27%
Counselors	13	19%
		1000
1 otal	73	100%

The total number of courses by disciplines reveal that there has been an equal distribution of courses for physicians, therapists, and prosthetists. While equality in the number of courses is desirable, the faculty has primarily considered student demand and the immediacy of teaching new techniques.

TABLE F: SCHEDULE OF COURSES

	1	4/k	ζ.		B/F	<	S/P	I	1/E		L_{i}	E		J/A	1	RCC	Totals
	Pr.	Ρ.	T.	Pr.	Ρ.	Т.	Pr.	Pr.	Ρ.	Τ.	Ρ.	Τ.	Pr.	Ρ.	Τ.	С	
59-60	2	2	2	3	3	3	1	0	0	0	0	0	0	0	0	5	21
60-61	1	0	0	3	0	0	1	2	2	2	5	5	0	1	1	4	27
61-62	1	0	0	3	0	0	1	1	2	2	4	4.	1	1	1	4.	25
							—										
	4	2	2	9	3	3	3	3	4	4	9	9	1	2	2	13	73

Code of Courses:

A/K, Above-Knee Prosthetics; B/K, Below-Knee Prosthetics; S/P, Fitting and Fabrication of Special Prostheses; U/E. Upper-Extremity Prosthetics; L/E, Lower-Extremity Prosthetics; J/A, Management of the Juvenile Amputee; RCC, Rehabilitation Counselors Course.

Students:

Pr., Prosthetists, P., Physicians, T., Therapists, C., Counselors.

While there is no recommended sequence of courses for the prosthetists, the pattern of enrollment has been as follows: B/K, A/K, U/E, and S/P courses. After 1959-1960, the A/K and B/K courses for physicians and therapists were combined into an integrated course. These groups tend to enroll first in the L/E and then follow with the U/E and/or J/A courses. The faculty made the completion of one prosthetic course a prerequisite for all applicants for the J/A course during 1962-1963 because of the highly specialized nature of the course.

In the curriculum, the therapists enrollment is the only clear example of specialty preference:

IADLE G: IF	IERAPISIS COU	NSE EINRULLMENT	
	L/E	U/E	J/A
Physical Therapists	205-96%	38-52%	29-77%
Occupational Therapists	6-3%	30-41%	9-24%
Corrective Therapists	2-1%	5-7%	0-0%

Totals 213-100% 73-100% 38-100% In addition to showing the very large representation of physical therapists in all of the courses, they reflect the physical therapists' preference for the L/E course and the occupational therapists for the U/E course. The J/A course shows the strength of physical therapists enrollment, but the preferences are not as clear as in the other two courses. Miss Dorothy E. Baethke, Director, Division of Physical Therapy, University of Pennsylvania, has commented on this enrollment pattern which showed the physical therapists high enrollment in U/E:

I feel quite certain that the reason that physical therapists are showing a greater interest in upper-extremity prosthetics is the philosophy of patient care by the physical therapist. This is concerned with the treatment of the whole person and not only with treatment of one aspect of the disability. Another reason may be that prescriptions for treatment are being given increasingly earlier in the patient's illness. This leads to utilization of specific treatment by the physical therapist in the preprosthetic and prosthetic stage before function treatment is given by the occupational therapist.⁹

In short, Miss Baethke has suggested that treatment of the whole person and earlier prescriptions are possible answers for the increased interest in U/E courses by the physical therapist.

Students continue to comment that their clinical experiences in the total curriculum are the most meaningful of all their experiences. The teaching patients make an invaluable contribution here. In three years of operation, 667 teaching patients have assisted the faculty in clinical demonstration.

An excellent article on efficiency in technical-medical teaching appears in the June, 1961, issue of this *Journal*. Dr. Cameron Hall, its author, explains the perplexing problem of teaching great amounts of technical information without greatly increasing the amount of classroom time.¹⁰ Efficiency of teaching means is the answer. Following many of the UCLA teaching techniques, Northwestern makes great use of slides, movies, and three dimensional objects as visual aids. Hand-out sheets, which are being bound this year, have been devised to permit students to take well-organized notes.

¹⁰ Hall, Cameron B., "Efficiency in Technical Teaching," Orthopedic and Prosthetic Appliance Journal, June, 1961, 139.

^{*} Letter of Dorothy Baethke to Jack D. Armold, Philadelphia, July 31, 1962.



FIGURE 3—A student clinic team evaluates a lower-extremity amputee during the practice session of a recent course.

The emphasis here on efficient teaching is not intended to de-emphasize quality teaching. The efficient means are used primarily in the didactic instruction where scope and time are major considerations. The "depth teaching" is accomplished primarily in the laboratory-clinical sessions where students may pursue their questions and the instructor may reinforce his earlier instruction.

Faculty and Staff

More important in any education program than any curriculum is the faculty. Its quality and its genuine interest in medical and para-medical education will provide the backbone of the entire program. Northwestern President, J. Roscoe Miller, said recently: "We cannot expect to have a great University unless we have excellent teachers."¹¹

One of the stated goals of this program is to increase the supply of personnel in the related fields serving the disabled. As the previous material on students has shown, the teacher in prosthetics and orthotics is faced with the dilemma of realistically considering student background and ability, and at the same time, satisfying his own standards of achievement for the student. Forty-three faculty members have and are presently attempting to meet this difficult challenge in teaching.

The basic objectives of a faculty providing medical education, as stated by Dr. Arey, are worthy of consideration:

... To offer the student the opportunity to gain an understanding of the principles of the basic medical sciences—and especially to master the art of experimental method—and to provide him with

¹¹ Quoted in Northwestern University Alumni News, July, 1962, 6.

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the further opportunity of extending these principles to the practical study of patients . . . If a superior school, it also encourages students to develop their latent potentialities and arouse interests as far as possible.¹²

The Prosthetic-Orthotic Education faculty seeks to carry out the basic objectives of the Medical School, which include the teaching of principles, methods, practice, and potentiality development.

The interdisciplinary nature of this program may be seen in the sixteen specialties represented by the faculty during the past three years: orthopedic surgery, 8; prosthetics, 8; orthotics, 4; physical medicine and rehabilitation, 4; physical therapy, 4; occupational therapy, 3; rehabilitation counseling, 2; education, 2; dermatology, 1; engineering, 1; psychology, 1; general surgery, 1; neurology and psychiatry 1; medical editing, 1; medical photography, 1; and rehabilitation administration, 1.

The full-time staff assists the faculty in carrying out its objectives. The staff includes: Director, Associate Director and Chief Prosthetist, Chief Orthotist, Instructor in Prosthetics and Orthotics, Editorial and Administrative Assistant, Medical Assistant, Laboratory Assistant, and two Secretaries. The two part-time staff members are a Medical Photographer and the Staff Artist.

Extra-University Activities

Extra, a prefix, is taken from the Latin word, *exter*, which means "beyond" or "outside the scope of." ¹³ *Extra*- expresses well an important function of this program which goes beyond and is outside the scope of the two campuses of Northwestern in Chicago and Evanston. The extra-University objective is to participate with professional associations and educational institutions in their efforts to improve the quality of professional preparation for service.¹⁴

The Organization Chart (opposite) shows the University in the national picture and includes those associations and institutions most directly related to this program. The administrative function belongs to the University. The Office of Vocational Rehabilitation finances the major portion of the program. The University Council on Orthotic and Prosthetic Education coordinates the three University programs. Consultations are frequently held with the two prosthetic Committees of the National Academy of Sciences.

A major example of Northwestern's participation with another professional association may be seen in the activities of the American Orthotics and Prosthetics Association. The faculty has presented papers at three National Assemblies and fifteen Regional Meetings. The Association recently contacted the University to conduct a course in business and administrative procedures for owners, managers, employees, and suppliers of prosthetic and orthotic facilities. The School of Business, in cooperation with the Association and Prosthetic-Orthotic Education, will administer and conduct the course.

Inter-professional cooperation has made possible the production of the film, "Gait Analysis." The Committee on Prosthetics Education and Information and the University produced the film and prepared a supplemental booklet which will be distributed at the film showings. The film has already been shown in Europe and more than twenty States.

From its beginning, Northwestern has benefited from the experience and advice of Dr. Miles Anderson, of UCLA, and Dr. Sidney Fishman, of

¹³ Arey, op. cit., p. 463.

¹³ "Extra-" in Webster's New Collegiate Dictionary, Springfield, Massachusetts, 1961. ¹⁴ U. S. Department of Health, Education, and Welfare, Office of Vocational Rehabilitation Training Program, Washington, D. C., March, 1962, p. 1.



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NYU. The University Council on Orthotic and Prosthetic Education, in its second year of operation, has provided the three Universities with the means to facilitate better communication and working relationships in their efforts to serve the professional fields engaging in serving the disabled. The Council has sponsored study groups in A/K prosthetics and examinations for physicians and therapists. These and other cooperative projects have provided positive results.

Perspective

The look into the past of this educational program in prosthetics and orthotics has yielded several observations. The focus has been placed upon philosophy, students, curriculum, faculty, and extra-University activities. With a reference to our historical perspective, it remains for us to project into the future.

Service to the disabled is our raison d'etre, our reason or justification for existence. Key to our philosophy are the beliefs that effective teaching, based upon sound research, is our available means to contribute to the service objective and that the University is the logical institution to train personnel to work with the disabled. Supplementing private administration and financing, the Office of Vocational Rehabilitation has assisted the University in meeting rising costs of medical-paramedical education in prosthetics and orthotics with the result that services to the disabled have been upgraded. Mounting costs in research and education will make it most probable that the use of federal funds in these fields will grow.

Student enrollment is the major endorsement of this educational program. Classes have generally been filled to capacity and applications are currently being received at an increasing pace. The future will undoubtedly bring larger numbers of post-graduate students to the University. The 1962-1963 academic year should have an enrollment which will exceed four hundred and fifty. This would be an increase of approximately thirty students over the previous year. Larger physical facilities and tighter scheduling will be required before the enrollment can go beyond five hundred students.

The analysis of student enrollment has shown that the average student in the past three years was forty years of age, from the Mid-West or South, and is certified or seeking certification in his specialty. There is good reason to believe that this typical student will continue to enroll at Northwestern in the greatest numbers, but some degrees of change will probably occur.

Students in other disciplines will enroll in the future. They will probably be younger and will come from both coasts in greater numbers. The spinal orthotic and juvenile amputee courses, which are offered only at Northwestern, will attract students from the entire nation. New disciplines will probably include social workers, rehabilitation nurses, and other medical specialists.

An educational program with an interdisciplinary approach inherits some of the inherent evils of specialization. Specialists naturally stress their particular interests and feel slighted if their needs are not emphasized. Nevertheless, the first principle of service to the patient has transcended the lesser good of intra-specialty considerations in our student body. The special interest factor coupled with variabilities in formal education and practical knowledge make the teaching of heterogeneous students a difficult, but rewarding challenge.

New student awarenesses and the development of new techniques will make considerable changes in the present curriculum. Last year the pros-

thetists were offered 27% of the courses at Northwestern. However, the development of new techniques has made it necessary to increase the total to 35% next year. Concerning the effect of new techniques on curricula, A. Bennett Wilson, Jr., Chief of Staff of the Committee on Prosthetics Research and Development, said:

The educational programs can look forward to teaching principles and techniques relating to porous laminates, harnessing, kneedisarticulation, and the polycentric knee. A farther look would include the teaching of external power in prosthetics. A greater emphasis will be placed upon the geriatric patient.¹⁵

The research groups of the Veterans Administration and the University of California at Berkeley contributed to the three prosthetic programs by developing new techniques in the total-contact above-knee prostheses which will probably be taught in the Universities during the next academic year.

The analysis of the curriculum showed that the physical therapists showed a preference for both the L/E and U/E courses, while a strong majority of occupational therapists chose the U/E in preference to the L/E course. While the degree of preference will probably remain, both groups of therapists should be encouraged to take both courses. In support of this opinion. Miss Baethke wrote:

Certainly there are general principles of prosthetics common to each of the extremities which would provide the orientation the O.T. needs when a patient has a lower-extremity prosthesis, and the P.T. needs when the patient has an upper-extremity prosthesis. With orientation to these general principles the P.T. or O.T. should be able to transfer the detailed knowledge of prosthetics for one extremity for general use for the other.¹⁶

The heart of any university is its faculty. Its competences and genuine interest are inextricably interwoven into all aspects of university life. With the addition of new students and new courses, new faculty members will join the present list.

The full-time staff assists the faculty in administering the program by preparing course materials and processing applications. The growth of the program has made additional demands on the staff. During the past year. Miss Susan Hastings joined the staff to edit the publications of the faculty and to assist in administrative duties. Mr. Charles Fryer, an instructor in prosthetics and orthotics, joined the staff September 4, 1962, to assist in teaching the present courses and to develop new courses in the field.

The extra-University function is but an outgrowth of the need to disseminate principles and methods beyond the boundaries of the two Northwestern campuses. There are demonstrable signs that the University is making an impact upon the professions serving the disabled. Correspondingly, the University undergoes change as new ideas are imparted to it, as teachers return from the field. It is a continued process, with the faculty seeking out new seed, then returning to sow it. Henry Adams once wrote: "A teacher affects eternity. He never can tell where his influence stops." 17

The University continually enlarges its foundation, extends its boundaries and adds to its superstructure. A later look at this part of the University will show the form and manner in which another "new image" in professional education was shaped.

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¹⁵ A. Bennett Wilson Jr., Personal Communication, August 3, 1962.

 ¹⁶ Dorothy Baethke, op. cit.,
¹⁷ Quoted in Northwestern University Alumni News, op. cit., 11.