The title, "From Kinesiology to Adaptation," could have many interpretations, and I suspect that each of you has come with different expectations about what you will hear. From my point of view, it speaks to our need as professionals to know the basic sciences, and to interpret that knowledge through our media to allow the client to adapt to his or her status at any given point in time. Lorna Jean King spoke to us regarding a "Science of Adaptive Responses" in her 1978 Slagle Lectureship (1, p 429). She quoted Tinbergen, who said, "Adaptedness is a certain relationship between the environment and what the organism must do to meet it." (1, p 431) King then outlined four characteristics of individual adaptation.

1. The individual is active, NOT passive, in the process.
2. Environmental demands of needs, tasks, and goals evoke the adaptive response.
3. The adaptive response is organized at the subcortical level while the individual's attention is directed to the activity.
4. Successful responses feed back as reinforcers to meet the next challenge. (1, pp 432-433)

What Do We Need to Know

If these four tenets are true, and are based on neurophysiological principles, as I believe they are, then what do we need to know to put them into practice?

First, we need to know and understand those basic sciences that speak to how Man is "put together" and functions. These would include anatomy/physiology/kinesiology; neuroanatomy/neuropsychology; and psychology, including theories of development, stress adaptation, problem solving, and intra/interpersonal relationships.

Second, we need to have an overall, synthesized understanding about how all of these isolated bits of knowledge come together to make a whole person. In other words:

1. No one system operates in isolation but each is interdependent in order to have a functioning whole.
2. Each individual is a multitude of feedback processes with the distant and immediate past laying a foundation for the present, and the present being part of the foundation for the future.
3. If there is a breakdown for any reason in any of the multiple, interactive circuitry, then the foundation laid may be one of dysfunction that may then adversely affect future functioning.
4. The circuitry can be changed when appropriate demands for an adaptive response are provided. Thus, if the occupational therapist has the knowledge base to understand all of this processing, then the therapist is equipped to provide appropriate intervention, not only in the acute and chronic stages of dysfunction, but also at the level of prevention.

Third, we need to know our media that are activity based so that the adaptive response of the individual can be appropriately organized subcortically as the person is actively involved.

The Literature Review

In preparation for this presentation I took an enjoyable journey through the occupational therapy literature, from 1920 to 1980. My primary purpose was to determine whether or not our educational process provided us with a sound, basic science background—when did it start, what changes have been made, and what is the current status? General scientific knowledge has grown considerably since 1920, but listen to the vision and foresight of our founders and our leaders since 1918.

The Reconstruction Aides were trained as either physical therapy aides "to give massage and exercise and other remedial treatment," or as occupational therapy aides "to furnish forms of occupation to convalescents in long illnesses and to give patients the therapeutic benefit of activity." (2, p 11) Training courses were 6-to-12 weeks in length and included: psychology of the handicapped, fatigue and the work cure, personal hygiene, anatomy, kinesiology, ethics, hospital administration, crafts, and hospital work (2). Granted, in 6-to-12 weeks, there will not be great depth in any of these topics, but a cornerstone of the foundation was laid with the inclusion of basic science information and media.

By 1921 the Massachusetts Society for Occupational Therapy had established criteria for a 12-month training diploma course—9 months of didactic work and 3 months of...
hospital work. The didactic work included:

1. Forty lectures in anatomy, covering the brain, spinal cord, special senses and peripheral nerves; skeletal system; muscles; circulation; digestion, respiration; reproduction; skin; and genito-urinary and glandular systems.

2. Three lectures in neurology to cover functions of the central and peripheral nervous systems, tumors, and nerve injuries.

3. Two lectures on mental disorders that included normal function of the brain and organic and inorganic diseases.

4. Three lectures in psychology, including normal and abnormal, and intelligence tests.

Additional topics and lecture hours included: social service—6, personal hygiene—3, mental hygiene—3, hospital ethics and management—2, orthopedics—8, tuberculosis—6, syphilis—2, contagious diseases—1, clinical records and bookkeeping—1, and physiotherapy—3. The practical aspects of the course included instruction in and hospital practice with 12 major crafts and 16 minor crafts (3, pp 183-184). Once again the need for basic science knowledge was emphasized along with media.

In the same year that Dr. Brackett presented the above curriculum to the Fifth Annual Meeting of the National Society for the Promotion of Occupational Therapy, Dr. John Adams spoke to the physical, mental, and moral makeup of the competent occupational aide.

It is personality which makes the initial impression for good or bad on the varying types she will meet. . . . The picture she presents should be expressive of neatness in dress . . . cleanliness of skin and hands, an expression of cheerfulness and an attitude of confidence and faith in her approach." (4, p 188) He closed with It is our wish to establish a profession based upon the highest ideals, productive of the greatest efficiency in the application of therapy to the patient. (4, p 192)

At the Annual Meeting of the American Occupational Therapy Association in 1923, "Minimum Standards for Courses of Training in Occupational Therapy" were formally adopted (5). The minimum course length was 12 months (with no less than 6 hours daily) including 8-9 months of course work and no less than 3 months of hospital work. Not less than 75 hours was to be devoted to lectures for which 17 topic areas were listed. This was followed by

It is particularly desirable that adequate instruction shall be given in:

A. Psychology, normal and abnormal
B. Anatomy, kinesiology, and orthopedics
C. Mental diseases
D. Tuberculosis
E. General medical cases including cardiac diseases." (5, pp 297-298)

Practical work included 13 craft areas with the stipulation that it be covered in no less than 1,080 hours, which is equivalent to 6 months (5). Again the emphasis on psychology, anatomy, kinesiology, and media was spelled out.

It was to be another 12 years before the first Essentials of an Acceptable School of Occupational Therapy were ratified in 1935 in conjunction with the American Medical Association. Length of training was expanded to 100 weeks, with "not less than 64 weeks of theoretical and technical instruction and not less than 36 weeks of hospital practice." (6, pp 5-6)

Required subjects for the diploma programs were now described in semester hours and included the following:

1. Fifteen semester hours in the biologic sciences of: anatomy, kinesiology, neurology, physiology, psychiatry, and psychology—approximately 40 clock hours per subject for a total of 240 hours.

2. Four hours in the social sciences.

3. Four hours in the theory of occupational therapy.

4. Four hours in clinical subjects.

5. Three hours of electives.

6. Thirty semester hours in media for 960 clock hours.

Notice the increased emphasis on the biological sciences as knowledge expanded, and the decrease of 120 hours in media classes.

In 1949, the Essentials were revised to reflect changes in the practice of occupational therapy, expanding knowledge, and the fact that some programs were now granting a degree. The required length was still a minimum of 100 weeks split 64/36 as before. The 64 hours of didactic instruction was now further divided into 39 semester hours of theory and 25 semester hours of technical instruction in therapeutic activities. The curriculum breaks down as follows:

1. Biologic sciences now included anatomy, kinesiology, neuroanatomy (listed separately for the first time), physiology, and psychology, with an increase to 18 hours. The breakdown was approximately 58 hours per subject for a net increase of 18 hours.
2. Social sciences remained at 4 hours.
3. Theory of occupational therapy was increased to 8 hours.
4. Clinical subjects increased to 7.
5. Electives were decreased to 2.
6. Media were decreased to 25 hours for a total of 800 hours. (7, pp 208-209)

By the time of the 1965 Essentials revision, professional education was at the degree or post-degree levels of certificate or basic master's. The Essentials stated that "A broad base of natural sciences, behavioral science and humanities is the strongest foundation for the specialized professional subjects and required clinical experience." (8, p 7) Thus, with the allocation of credit hours, it is assumed that the student has already completed basic, introductory courses as prerequisites. The rationale behind the credit allocation included:

1. "To emphasize the importance of increasing course content in neuroanatomy and neurophysiology.
2. To effect a greater emphasis in the study of the behavioral sciences.
3. To increase interest in the development of core courses which would provide...skills in fine and applied arts.
4. To emphasize the need for organized instruction in equally important subjects such as prevocational evaluation, activities of daily living, etc." (8, p 8)

Curriculum content was divided as follows:
A. Biological sciences: 9 credits in principles of human motion (or kinesiology) and "human anatomy and physiology with emphasis on neuroanatomy and neurophysiology." (8, p 8)
B. Behavioral sciences: 9 credits, including "human development; personality development; group processes: interpersonal and interprofessional relationships." (8, p 8)
C. Physical and psychosocial dysfunction: 6 credits.
D. Occupational therapy skills: 9 credits for 288 clock hours.
E. Occupational therapy evaluation and treatment principles: 12 credits.
F. Clinical experience: 6 months minimum.

Thus, if you include the prerequisite courses in zoology, biology, physical sciences, psychology, sociology, and/or anthropology, plus the professional courses in biological and behavioral sciences, the total semester hours were up to 34 to 38 credits for approximately 640 classroom hours over a period of 4 to 6 years. Within 44 years, the number of classroom hours in basic sciences increased more than 12 times, whereas the emphasis on media was decreased by half! I believe that is a very forceful statement by the field regarding the necessity for and the importance of basic science content for effective therapy. We should indeed be grateful to our founders and leaders throughout the years for this emphasis on basic science, but what happened to our use of purposeful activity? This kind of comparison cannot be done with our present Essentials, adopted in 1973, because they include neither specific course content nor hours, but, instead, are built around terminal behavioral objectives. This leaves interpretation by any given educational program wide open and probably makes it difficult to evaluate consistently from program to program.

The April 1980 Report on Review of the Essentials (9) submitted by the ad hoc Committee on Educational Standards Review, chaired by Nancy Ellis, summarized the review of both the OTR and OTA Essentials. This review was conducted in 1979 and included most occupational therapy educators plus clinicians, students, administrators, and professional educators. My interpretation of this report's section on Basic Human Sciences content is that the Essentials is too vague, and guidelines need to be more definitive and correlated with the relevancy to occupational therapy. This kind of comment occurs throughout the report, pointing out many areas that need further clarification. Basically, the documents were believed to be adequate but problems of compliance do occur, especially with the OTR programs. In accordance with the Review Committee's recommendation, the process of Essentials revision is under way. The Role Delineation document before the Representative Assembly was the first step.

This document was passed at the March 1981 session of the Representative Assembly with only minor editorial changes. After a discussion with several of the Representatives and educators about what implications they thought this document might have for the educational Essentials and process, I came away with several concerns. Some Representatives seemed to be unaware that this document was
to be the foundation for revised Essentials. Some openly stated that they had not had time to thoroughly study the document but had voted for it. Is this the appropriate way to make major decisions that will affect our entire profession? Was there really time enough for adequate input by the membership when the document was not published until January?

Some educators think that the document won't make any difference because our Essentials are so vague anyway. Others think that this will turn our Essentials into "10,000" behavioral objectives that will place undue burden on the educational process. Others suggest that there seems to be confusion over the term "entry level." Does it mean the first day of the first job, or does it mean the last day of the first year on the job? A great deal of learning occurs that first year. If it means the first day, then as an educator I have grave concerns regarding this document and its implications for the educational process.

I believe that, if the Essentials document was more definitive, then:

1. There would not be as much confusion regarding compliance.
2. There would have been less time spent in the Curriculum Advisory Committee with a multitude of program directors on the problem of compliance. Thus there would have been more time for active program consultation by the committee.
3. There would have been better correlation between the self-study document (mandated by the federal government) and the accreditation document, which in their present formats have become a burden to almost every educator.

If we believe that basic sciences are requisite to our practice in physical dysfunction, psychosocial dysfunction, sensorimotor dysfunction, sensory-integrative dysfunction, or any other area of practice, then we had better make sure that the Essentials stipulate the level and minimal depth of knowledge required. I do not mean that it necessarily has to be stipulated in semester or clock hours, but it does need to be more clearly defined. I find it very disturbing to learn from some recent graduates that there are accredited programs that do NOT require a knowledge base in, for example, functional neuroanatomy/neurophysiology for graduation. These new graduates then try to work with multiply-handicapped or learning-disabled clients. They become frustrated because they don't understand what they are dealing with and cannot respond adaptively to the clients' needs. Thus they must return to the educational process to learn the basics they should have learned earlier in order to have something to build on, or they leave the field, or they stay in the field and provide poor service that does nothing to help our image. Any of these outcomes is an indictment of our educational process, which is based on vague Essentials. As educators we are responsible and we must accept the responsibility to effect change. We cannot blame it on "they."

**Occupational or Physical Therapy**

Another area I would address is currently causing concern for two professions. Are we occupational therapists or physical therapists? What is the difference and what difference does it make?

*The Differences.* Even though both professions have a strong emphasis on basic sciences in their educational process, the emphasis is different. The physical therapy emphasis is more on the physical and biological sciences and includes more physics and chemistry and less psychology. This knowledge of physics and chemistry is necessary in order to understand the correct use of and precautions for their modalities of heat, light, water, and electricity, including biofeedback and EMG. Generally speaking, much of physical therapy is either done to the patient—that is, massage, ultrasound, ultraviolet, diathermy, hot packs, passive range-of-motion, joint manipulation and paraffin, to name a few—or it is pure exercise without purposeful activity, or conscious control of movement, both of which involve the patient but does not call for organization of an adaptive response at the subcortical level. You can spend hours teaching Johnny to hold his head up or straighten his elbow voluntarily. He can learn to do it consciously. But, if you give him anything else to think about at the same time, he will not be able to hold his head up or reach for an object. I do not mean to imply that these modalities done by physical therapists are not important in the patient's recovery process because they are very important. But, they do not meet the basic tenets of occupational therapy of the "therapeutic benefit of activity" (2) or the four...
Adaptation

characteristics of individual adaptation outlined by Lorna Jean King as stated earlier.

The Difference It Does Make. In the June 1980 Nationally Speaking column, Mae Hightower-Vandamm spoke to the concern by both AOTA and APTA regarding the potential, overlap of occupational and physical therapy. A joint task force was to be established to “identify the role of the two professional groups” (10, p 370) with three specific client groups. An agreement was made by the two associations to develop standards of practice and ethics based on the recommendations of this task force. However, a letter from our President is very disturbing. I quote:

Unfortunately, we could never get agreement from membership regarding the type of questionnaire to use to do this study, and there was tremendous resistance to a continuation of the project. Therefore in late 1980, the Executive Board did vote to discontinue the project and APTA was so notified.

My fellow occupational therapists—What are we afraid of?

On March 8, 1981, at 4:31 p.m., the Representative Assembly passed a new motion regarding OT/PT practice that charges our Executive Board to establish a task force to study the following two issues.

1. Identify areas of difference and overlap, and needed SOPs and ethics.

2. Identify areas of collaboration and professional enhancement.”

A report is to be given to the Representative Assembly in 1982. It is a possible step forward but the process cannot be completed without collaboration with the APTA. I would sincerely hope that we do not let this opportunity be sidetracked as we did the last one.

And when are we going to look at the overlap with psychologists, social workers, group workers, child life specialists, nurses, etc.? I hope we never reach the point where we feel obligated to assume the responsibility for heart transplantation because there is no one else on the staff to do it!

Now back to the OT/PT issue. Mariän Eliason and Azela Gohl-Geise published the results of a survey of 76 occupational therapy clinical centers nationwide regarding modalities used by each clinic (11). Twenty-two activity modalities were listed including needle crafts, ceramics, woodworking, weaving, ADLs, homemaking, sensory integrative and sensorimotor techniques with activity. However, 13 nonactivity-directed modalities were also listed. These included physical therapy techniques of ultrasound, hot packs, paraffin, massage, joint manipulation, passive range-of-motion, and biofeedback. In addition, there were modalities listed that could be occupational therapy if used appropriately, but that appeared to be inappropriately used—that is, active range-of-motion without purposeful activity, resistive exercise without purposeful activity, bicycle saw without purposeful activity, loom exercise without purposeful activity, and sensorimotor techniques without purposeful activity. It has never made any sense to me for a client to spend time in physical therapy riding the bicycle to increase range and/or strength and then come to occupational therapy and ride the bicycle jigsaw without a saw blade and project! Or they use the wall pulleys in physical therapy and a loom without warp and weft in occupational therapy. That is not occupational therapy!

The consequences of this blurring of roles could be serious. First of all it could be dangerous to the client. Without understanding the rationale for and precautions associated with modalities such as ultrasound and hot packs the client could be burned. Passive range-of-motion with stretching could tear tissues causing permanent disability or at least a prolonged recovery. Second, since physical therapists are licensed in all 50 states, an occupational therapist who does physical therapy modalities without proper credentials is probably violating the law and therefore could be sued for practicing physical therapy. If such a suit does occur our professional liability insurance would not cover the damages. The insurance only covers those treatment procedures for which one has been adequately prepared. Third, even if the occupational therapist does not injure the client, third-party payors will not cover the cost of treatment for an occupational therapist to do a physical therapy modality. Why should they?

Granted, it is not possible to teach or learn everything one will ever need to know in one’s professional life in a basic curriculum. One must continue to learn and update knowledge and skills through the various mechanisms of continuing education. But as occupational therapists we must learn to discriminate between those things that are a natural extension of our body of knowledge and thus reasonably added to our treatment, and those things that are outside our realm and rightfully done by others. I believe that biofeedback is not a natural extension of our body of knowledge, but sensory integration is. If we continue to grab at anything and everything that goes by we will fulfill a prophecy by one of
our colleagues as reported by Josephine Moore at the 1966 Annual Conference:

As long as we were asked by someone to do something we agreed as we felt this was the way to increase our status. We have jumped on every bandwagon that has rolled by. One day the hearse will go by—we'll jump on it and not know the difference until it is too late. (12, p 12)

If we want to be physical therapists, then we must do what is necessary to meet their certification requirements. If we are to continue calling ourselves occupational therapists, then we had better stick to our own body of knowledge and treatment modalities and not be dabbling in other professions' territories.

Challenge for the Future
I suggest that we have no need to usurp the modalities of others since we already have one of the most versatile, unique, and exciting health professions ever to exist!

In 1947, at the Annual Conference, Sue Hurt said:

We know that our medium of treatment is normal activities. We know that normal activities are the basis for human development and well-being physically, mentally, psychosocially, and economically. We know, therefore, that O.T. logically touches every aspect of rehabilitation—the physical, the mental, the psychosocial and the vocational. Therefore, it is essential that the occupational therapist's training help her to be aware of this broad, many sided potential contribution and that it give her as much specific knowledge in each area as possible. (13, p 96)

Mary Reilly, in her 1961 Slagle Lecture, stated:

Because our profession is focused on influencing the health of people there will always be a need to include in our body of knowledge the fundamental material of anatomy, neurophysiology, personality, theory, social processes and the pathological states to which these fundamental areas are subject. . . . We should have as a special contribution a profound understanding of the nature of work. (14, p 6)

The wide and gaping chasm which exists between the complexity of illness and the commonplaceness of our treatment tools is, and always will be, both the pride and the anguish of our profession. (14, p 1)

She also stated that the hypothesis upon which our profession was founded was one of the great hypotheses of modern medicine: "That man, through the use of his hands as they are energized by mind and will, can influence the state of his own health." (14, p 2)

Alice Jantzen, in 1962, said:

Measures of excellence in technology are basically quantitative measures and are best suited to the study of technical data. Although in occupational therapy we use some scientific tools, our specialty is basically an art, and the subjective qualities with which we work are not scientifically predictable nor can they be measured with scientific accuracy. However, these subjective qualities, of which creativity is one, are the major factors which in the long run determine the benefits derived from all types of patient care. Forward thinking members of many medical specialties realize that improvement of patient care will come with increased emphasis on these qualitative factors if we are to realize the benefits of technological improvements. It is significant to recognize that occupational therapy is, and always has been, committed to a concern for these factors. . . . (15, p 125)

Isn't it exciting and challenging to be a part of that kind of service to mankind?

Elizabith Yerxa, in her 1966 Slagle Lecture, also spoke to our uniqueness.

Occupational therapy is unique because we use the choice of self-initiated purposeful activities to produce a reality-orienting influence upon the client's perception of himself and his environment so that he can function. (16, p 3)

This . . . takes more knowledge, skill and sensitivity plus more faith in the individual than an authoritarian role of 'you must do this because it is good for you.' (16, p 4)

She went on to say:

". . . self-initiated activity is both a response to sensory stimulation and a source of additional stimulation by which the individual develops patterns of adaptive behavior. Passive movements apparently do not result in the same degree of adaptation. The individual must respond dynamically to changed stimulus relationships in order to adapt." (16, p 4)

And how well she said it with:

"Exposure to our media means a confrontation with objects and an opportunity for the individual to discover what he can and cannot do with them. Exposure to our professional spirit means that the indi-
individually confronts both our knowledge of his capacities and our faith that he has the right to control what happens to him.” (16, p 6)

Gail and Jay Fidler, in a 1978 article, discussed the role of purposeful activity in self-actualization.

“Doing is viewed as enabling the development and integration of the sensory, motor, cognitive and psychological systems; serving as a socializing agent, and verifying one’s efficacy as a competent contributing member of one’s society.” (17, p 305)

It is through such action with feedback from both nonhuman and human objects that an individual comes to know the potential and limitations of self and the environment and achieves a sense of competence and intrinsic worth. (17, p 306)

Wilma West told the Representative Assembly in 1978, “That which makes us unique and is so crucial in distinguishing our service from that of others with the same goals and objectives is activity or occupation.” (18, p 11)

And finally, in 1980, Gary Kielhofner, Janice Burke, and Cynthia Igli summed it all up with this statement. “The idea that, by engaging in occupation designed as therapy, man can restore, increase, and maintain his ability as an occupational creature is the foundation of occupational therapy.” (19, p 778)

Although they use different words and phrasing, all of these leaders, plus many others over the years, have said basically one thing. Occupational therapy with its unique foundation of broad basic sciences that enables the occupational therapist to understand the functioning of the whole person and the importance of purposeful activity for health, can, by allowing clients the right to be actively involved in their program, help those individuals reach their maximum adaptive potential in whatever state of health and environment they may be through the use of purposeful activity. It takes an intelligent, creative, adaptive, risk-taking, secure, caring individual to be an occupational therapist. Have we got what it takes?

As we move into the 1980s are we willing to take the risks of:

1. Declaring that purposeful activity is our medium based on solid basic science data regarding human adaptive function?
2. Improving our educational Essentials and process where needed to meet the preceding statement?
3. Policing ourselves in all spheres of practice to do that which we say we do?
4. Explaining to others why we use commonplace activities and the knowledge upon which our practice is based without apology?
5. Expanding our sphere of practice only in those areas that are natural extensions of our knowledge base and stop jumping on everybody else’s bandwagon, or hearse, that goes by?

Our founders and leaders have given us a great challenge. Are we up to it? I believe that we are, and that we will not let die one of the greatest professions ever conceived.

With our eyes upon the Lord for his direction regarding the health of all, we "shall mount up with wings as eagles; . . . shall run and not be weary; and . . . shall walk and not faint." (20)

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