THE OPHTHALMOLOGIST’S ROLE IN NEW REHABILITATION PATTERNS

BY Richard E. Hoover, M.D.

Although the influence of several prominent ophthalmologists on new rehabilitation patterns has been sweeping, it has been largely unpublicized. It is the purpose of this thesis to present information on their role in order to enable other ophthalmologists to better equip themselves to assist in the development of rehabilitation programs.

One of the most sought-after workers for the blind is “the mobility instructor,” a highly trained professional whose importance is substantiated by a current shortage. There is no question that his competence and the philosophy which he represents are two of the most useful and hopeful resources brought to the service of blind people in our time. Again, it is certain that he is the direct product of programs which could not have begun or survived had not prominent ophthalmologists testified in the councils of government to the value of these experimental programs. Mobility instructors now graduating from Boston College and Western Michigan University were trained by instructors and resources developed at the Veterans Hospital at Hines, Illinois. The program itself went into operation against the advice of almost all officials, but upon the insistence of Dr. James N. Greetar,10 then chief consultant in ophthalmology at the Veterans Administration Department of Medicine and Surgery. In both concept and personnel it was the outgrowth of the United States Army Program at Valley Forge, Dibble, and Avon, which had been founded through the courageous insistence of Dr. Derrick T. Vail.18 As chief consultant in ophthalmology in the European Theater of Operations, Vail returned to the United States in 1944 to force through a dynamic, experimental program for blind soldiers, sailors, and veterans.

In exploring the usefulness of the “War Blind Group” of ophthalmologists, one must consider not only integrity and ability to command respect but also the methods which enabled them to enter this rather alien field successfully. Something, perhaps the large numbers of newly blinded people, caused them to reexamine what blindness

TR. AM. OPHTH. SOC., vol. 65, 1967
actually means in basic terms of eating and drinking and even making love. This permitted them a view quite different from that of the "agencies" which were "accustomed" to blindness. Many of these agencies had grown more preoccupied with the problems of administration than of blindness. For better or worse, the army's problems of administration were well in hand; this brought the problems of blindness into high relief.

However appalled ophthalmological colonels may have been by the realities on their wards (including cane pounding and spilled milk), they faced them and set out to find solutions. As Gowman\(^9\) and Greear\(^10\) have shown the chief remedy was the sighted G.I. who "taught" the blinded person how to be blind. The agencies, who had originally been cool toward the War Blind Group, were now horrified. By 1946 the idea of the blind leader of the blind, which was so brilliantly exploited in the last century by Sir Francis Campbell, had become so nearly sacred that in adult programs at least it was almost a fundamental principle that all instructors of the blind be blind themselves. As alienation from formal work for the blind increased, so did the opportunity for experimentation. It was in such environments, unencumbered by old rituals, that new patterns began to develop. In fairness, it must be said that the army had in large numbers one element which the agencies had always lacked: personnel. However, it is also true that army personnel were willing to encourage the independence of blind people with true zeal for freeing them from custodial care. They saw plainly that this involved everyday practicalities.

People in work for the blind expected that ophthalmologists charged with the War Blind Program in World War II would fail because the War Blind Program of World War I had been a failure. In the earlier program a revolution had been promised and none had ensued. It was whispered that ophthalmologists did not know how to handle the blind or what was best for them and that sooner or later ophthalmology would abandon the Blind Rehabilitation Program of World War II. The ophthalmologists made bad prophets of these skeptics. Two classic examples of this success were the World War II Army Program, the indisputable progenitor of the current peripatologists, and the Royal Normal College for the Blind, which would certainly not have come into being without the backing of Thomas Rodes Armitage, an ophthalmologist.

It has been a perplexing factor in the history of these important events in rehabilitation of the blind that the ophthalmologists who
played such important influential roles have been so ready to vanish when their good deeds were done. Though it has undoubtedly been the mark of statecraft for them to allow others to take credit for their achievements, its negative aspect has been the continuance of a discouraging view of the ophthalmologist's role in rehabilitation which antedated World War II and which seems to have a tendency to spring up for obvious psychological reasons. Unfortunately this often deprives blind people of important influences which might benefit them.

The schools, workshops, and centers for the blind with which the public is familiar may lead to the erroneous belief that all blind people are collected in these places, where their problems and those of society are solved. However, the people at these centers represent only a small proportion of the blind population. The majority of the blind are scattered and integrated in the community: "Almost never is society put at a disadvantage because large numbers of blind people have suddenly appeared in a particular place." This clarifies to some extent the diversified and often misinformed concepts found among many other ophthalmologists.

Simmons, after interviews with several ophthalmologists, divided these members of the profession into three broad groups on the basis of their awareness and knowledge of the problems of the blind. Group one included those who had never sent a patient for rehabilitation services during their entire practice. One doctor revealed that when confronted with a severe problem involving marked visual loss, he sent the patient to the National Institutes of Health or Johns Hopkins for further diagnosis and therapy, and further, that if he should have a blind patient, he would send him to the Braille School in Baltimore, although there never had been one to send in twenty years of practice. (In fact, no such school exists.) His philosophy was, as he phrased it, "A sick eye resides in a sick body." And he maintained that these people have a very poor prognosis. In group two were those who leave no stone unturned, sending their patients to the National Institutes of Health and various institutions, but who are actually unfamiliar with agencies and their functions. The physicians in group three could cite cases of successful rehabilitation; they were aware of the severe problems a blind person must face and frequently had favorite agencies to which they referred their patients.

Before he became a physician, the author had an opportunity as an instructor of the blind to observe at first hand the early changes in this field. Subsequent experience as a physician and an ophthalmologist has engendered the hope that ophthalmology might be more helpful
to blind people. In order to make the most humane use of his stature in the public mind and his access to blind people, the ophthalmologist should be familiar with certain basic information. All who enter this field wonder at first what is meant by talk of its multiplicity. In time they realize that blindness affects every aspect of human experience—the philosophy, theory, and technique of doing, thinking, and feeling, and always on an other-than-visual basis for performing.

THE PHYSICIAN

Exploratory studies reveal that 90 per cent of the blind seek medical care soon after the onset of serious eye symptoms. The eye physician, in addition to being one of the first professionals the blind person consults, symbolizes for the patient the ultimate in professional competence and knowledge in the area of visual impairment.

The ophthalmologist’s role is fundamentally one of treatment, restoration, and prevention. Nevertheless, in the total medical program an understanding of medical therapy, surgery, safety, heredity, and rehabilitation are all necessary. Through training and experience the eye physician is competent in areas of health care, but may not always be prepared to envision rehabilitation as a part of medical therapy. The ophthalmologist’s understanding of the area of visual impairment can be extremely beneficial to his patient. His potential power to encourage the use of rehabilitation services is great and his authority at a time of crisis may contribute significantly to future rehabilitative efforts. The patient senses his attitudes, expressed or unexpressed, and responds to them.

Information about condition and prognosis should be given as early as possible. The importance of this early timing must be emphasized. Hope for recovery or a miraculous cure when it is not justified is usually detrimental to the patient. The physician should not consciously or unconsciously feel guilty about the patient’s visual condition or feel he has “let the patient down” if he cannot prevent loss of or restore vision. Yet such feelings may cause him to withhold a diagnosis of irreversibility and arouse a dangerous false hope.

The ophthalmologist should be able to envision rehabilitation as well as medical and surgical care. He need not equate poverty with the need for service or think only in terms of jobs or vocational training. His understanding should encompass training in social services, recreation, education, home care, child care, self care, communicative
skills, mobility, and vocations. The lack of such knowledge is inevitably reflected in the care and counselling of the blind patient. The ophthalmologist need not be a psychologist or a psychiatrist, but he should be aware of the need for psychological security. Carroll2 has designated as threats to this security losses affecting physical integrity, confidence in the remaining senses, reality contact with the environment, visual background, and light security.

THE BLIND

The most widely accepted definition of blindness in the United States had its inception in the deliberations of the House of Delegates of the American Medical Association in its 85th Annual Session held in Cleveland, Ohio, in June 1934. The definition states: “A person shall be considered blind whose central visual acuity does not exceed 20/200 in the better eye with correcting lenses or whose visual acuity, if better than 20/200, has a limit to the central field of vision to such a degree that its widest diameter subtends an angle of no greater than twenty degrees.” Like all aging covenants, it must be respected till the world can negotiate a better formula.12 It has become firmly entrenched in the lives and thoughts of physicians and the public. Yet, an honest analysis of the definition reveals its inadequacies as a means of identifying with any degree of preciseness those who are visually disabled, since it leaves the physician without guidelines to predict and direct rehabilitative services. To determine statutory blindness, only two visual characteristics need to be measured. These are the best corrected visual acuity for distance or the central fields, if the visual acuity is better than 20/200. There is no requirement concerning standardization of lighting, test charts, or distances for visual acuity, and no mention of size, color, or distance of test objects in determining field capacity.

In other words since the definition specifies no levels of disability, it implies that all have the same visual impairments, or that all good doctors have such rapport that uniformity is automatic. Since this is not the case, the physician must assess disability as well as impairment, without prior standards of visual measurement to help determine visual ability or disability. It is comparatively easy to assess someone as totally blind and thus totally visually disabled. It is often difficult to evaluate visual ability or disability in the person who has less than total loss of the sense of vision.
Peckham says: “The potential ability of the partially sighted for peripheral response, either of rods or cones or both can provide a guide in attempting to assist the patient with visual aids. Subjective estimation of the remaining visual capability is quite difficult to obtain: The patient cannot explain why he cannot see. . . . Our usual habit of depending upon macular vision and of assessing all visual response by macular response is fallacious. . . .” He recommends objective tests to assess the retinal response of the rods, cones, and ganglion cells differentially.

The customary definition embodies two dictionary definitions—the blind who have no sense of vision, and the cecutients who are visually impaired. The blind are also either masculine or feminine. They are either congenitally or adventitiously blinded. If they have been adventitiously blinded, it could have occurred at any age after birth and existed for any length of time. They can be of any age and any intelligence, and have additional handicaps, other medical problems, and a wide diversity of training, aptitude, interests, and experience.

An increase in blindness is predicted. Even if it were not, it is such an important world health problem that interested physicians should understand the rehabilitative as well as the medical and surgical care of these people. In this regard, they should realize that there is a “how” they see and a “what” they see, since only about one-quarter of the estimated 500,000 “blind” are totally so. The practical and psychological problems associated with “blindness” are significant and intimately affect medical and rehabilitative care.

**THE PROBLEMS OF THE BLIND**

The totally blind (those without useful light perception) are much easier to categorize than the cecutients (those with partial sight) and so in most ways are easier to mold into a rehabilitative pattern. The cecutient is faced with a myriad of visual problems, as well as the social, psychological, and financial problems and basic skill losses he holds in common with the totally blind person.

In view of the tendency to play down one’s own inadequacies and disabilities, whatever they may be, it is surprising how little sympathetic understanding people extend to those with severe sensory deprivation (such as severe visual loss) who may not wish to be labeled “handicapped” or “blind.” Although their protests are not always eloquent, many are so sensitive that they might go hungry rather than accept the gratuities for the blind. In certain areas the habit of apply-
The word “blind” to those who have useful vision persists. Physicians and service workers alike have an obligation to respect the feelings of those who see poorly, but who do see. They are not without the sense of vision and usually do not want to be considered sightless, which denies the blessing of whatever sight they have. Blindness is the ultimate of visual loss which the person with sight fears with a special intensity.

When his blindness occurs the permanently blind person loses his ability to manage in the world by visual means. It is a devastating impairment; but the sooner he is informed, and understands, recognizes, and accepts this total irreversible loss, the sooner he will become efficient in his management of a dark world. The cecutient, however, loses his ability to manage by visual means many times during the day, month, or year. Nevertheless, on occasion and under certain conditions he uses vision. People who retain even a small remnant of the sense of vision use it for certain tasks no matter how inefficient or painful it becomes.

It is a rehabilitation maxim that one can only be rehabilitated at the level of the impairment. Failure to consider those with severe but not total visual loss in the aid to the “blind” has had subtle effects on medicine, program planning, and services. It is a partial denial of the basic principle that people are individual in their problems and needs. A visually impaired person cannot be rehabilitated as totally blind. All processes must unite to incorporate the remaining vision into as effective and efficient a system of personal management as possible. The dynamics of emotional adjustment are very similar in all cases, however, differing primarily in intensity, duration and stability of adjustment.

It is important to recognize that the cecutient has a built-in ambiguity: he must be brought to realize that it will be difficult for the public, friends, associates, and professionals to fully understand his needs for special aids and techniques in certain areas and situations when in other areas and at other times he apparently functions as a normally sighted person. There is a body of ophthalmological knowledge which can help these people identify areas and situations in which special aids and techniques are necessary. Such a person must become skilled in interpreting his impairment to others when situations demand it.

There are three avenues open for the cecutient, but only one offers a reasonably serene and full life. If the cecutient withdraws into a familiar and unchanging environment which can be well controlled
with his visual capacity, he restricts his potential unnecessarily. If he continues to live the full life, enduring the hardships, inconveniences, dangers, and misunderstandings which are an integral part of his life, he is labeled at times "a charlatan," "a fake," "a maling erer," even "a drunk." The emotional and physical drain often causes him to operate physiologically on a razor's edge. It adversely affects his sense of well-being, creates great anxiety, and can jeopardize both his personal safety and that of others. The only truly effective course is for the person to maintain an objective viewpoint toward the restrictions and assets his vision affords him and to reorganize his attitudes, skills, techniques, and aids. The informed physician and trained rehabilitation personnel should direct therapy to this end. The patient's success depends on the practicability of the overall reorganization. It is not an easy task and takes his maximum efforts as well as continued professional interpretation of the nature and extent of his impairment.

The totally blind person unquestionably has losses which not even the cecutient faces to the same degree. His disability is psychologically more shattering because of its finality and threat of lifelong duration. There are a myriad of repeated frustrations in the daily life of the totally blind which reemphasize the helplessness and dependence of the condition. It is "soup with a fork" thousands of times during the working day. Eating, alone, can cause so many problems, embarrassments, and frustrations it is a wonder more blind people do not give up the effort to eat normally and revert to the bib and fingers. As Carroll says,2 "try it yourself sometime—the blindfold dinner technique. It won't teach you about blindness, but it will teach you about this phase of blindness." Acts of personal hygiene, dressing, shaving, grooming, shopping, telephoning, running a house, keeping accounts, putting away the groceries, sorting the mail, lighting a cigarette, finding the ash tray or the waste paper basket, cleaning the desk or the room are just a few of the problems which force dependence and the embarrassment it engenders.

Of the twenty losses described by Carroll2 there are two which are particularly significant in the practical scheme of everyday living. They are the loss of mobility and orientation skills, and the loss of communicative skills as ordinarily performed with a normal sense of vision. Unless one can continue to move from place to place and to read and write, one's world becomes woefully constricted and restrictive. These losses are of different degree, intensity, and direction, but they do occur and constitute major losses for both the cecutient and the
blind. The ophthalmologist is in a key position to direct and encourage therapy beyond the usual concept of diagnosis, medicine, and surgery.

COMMUNICATIVE SKILLS

A variety of solutions to the problems of blindness have been available for some time and new ones are always being proposed and requested. It takes precious development time to put scientific principles to work in routinely usable instruments. Consequently, by the time responsible investigators are ready to try a few reliable prototypes in the field, technology has advanced to a point where the prospective users know or dream of something smaller, lighter, more informative, and cheaper. Frequently, the product is felt to be obsolete even before a good analysis of its worth is attempted. Known ways of circumventing the loss of vision rely heavily on use of auditory or tactile senses, but one cannot interfere with the other and one cannot present information in a less efficient way than is practical and pleasant.*

In spite of this mass of technical knowledge, there are still many potential devices which would be simple and useful to the blind in their everyday lives but which are not yet available. Frequently requested are methods and devices for the following purposes:

- to make pie dough of uniform thickness;
- to cook pancakes, eggs, and various types of meats in a frying pan;
- to indicate when the typing is within three or four lines of the bottom of a page;
- for a blind typist to make erasures and corrections;
- for a blind person, living in a rural environment, to find the gate to his yard when returning home, or to locate the gate so he can shovel a path in the snow from his front door to this gate in the winter time;
- to center a piece of material for turning on a lathe;
- to make duplicate turnings on a lathe;
- to solder materials, such as wires in electrical equipment;
- for reading the volume control on the microphone when recording material on tape;

*For the most up to date international listing of educational, household, personal, recreational, vocational, and medical devices including thermometers, insulin syringes, hygrometers, and optical probes, the reader is referred to Proceedings of International Congress on Technology and Blindness, Volume 4, Catalogue Appendix, New York, The American Foundation for the Blind, 1963.
to indicate when a blind person is reaching the end of a spool of tape when recording on it;

to join narrow boards together and thus make a wide board for a table top, shelf, or similar project;

to enable a blind craftsman to sharpen his own chisels, hand or planer blades;

to enable a blind person to cut materials in wood or metal, using a pattern as a guide;

to read a level manually and by ear.

Students and blind persons in professions want a braille stylus that will not cause as much muscle fatigue as the present instrument when they have to write braille for several hours at a time under conditions where it is impractical to use the braille writer. Blind persons operating precision equipment in factories need micrometers, calipers, and various types of gauges that will enable them to measure materials at very close tolerances. Such tools should be suitable for a blind person of average ability, not just the exceptional individual.

There is enough familiarity with the typewriter, the talking book, the tape recorder, large type print, and braille that depth discussion here would not be meaningful. At the same time, the great need to provide the blind with a far greater wealth of literature than can ever be made available by any of the above methods must be emphasized. A device to translate the written or printed word and present it to the blind in the form of auditory or tactual information in a pleasantly acceptable manner and at a practical rate of speed would be exceedingly worthwhile and useful. The idea has been under study at various times during the past 50 years. It received new impetus during and after World War II and the Veterans Administration deserves credit for keeping interest and research active in this area.

There are two broad approaches being intensely explored. One is a direct coding machine which converts printed text scanned by a photoelectric sensing device into sound patterns bearing some relationship to the letter shapes. The reader has to learn to recognize the sounds and associate them with the printed letters. So far, machines of this type have been cumbersome, unreliable, and tedious and have not gained common acceptance. The other type of machine widely considered differs from the first one in that the machine itself is responsible for recognition at the letter level and could possibly produce spelled speech sounds or connected speech at the output. It is quite apparent that a machine producing ordinary speech is the best solution, but at the moment technical and economic difficulties make
it unlikely to be available for personal or private ownership for many
years to come.16 Until then, the time-honored and well-tested reading
and writing methods of braille, talking books, tape recorders, and the
typewriter must suffice for those whose visual ability is insufficient to
resolve the written and printed word.

ORIENTATION AND MOBILITY

For those who are deprived of the visual ability to maintain control
of physical position and movement from place to place, the loss of
orientation and mobility is probably the greatest. Historically, the
stick, staff, or cane has been the most common tool to help overcome
this loss.11 However, certain animals have contributed their skill and
services as guides, and from the beginning of time the seeing people
have, of course, acted as guides for those who could not see.

The author intends to develop this subject rather thoroughly since
developments in a hospital setting during World War II were
directly responsible for the advances since 1960 in the graduate
training of mobility and orientation instructors (peripatologists) to
propagate techniques and aids in travel. These new ideas and training
methods at first met great resistance but have now proven to be one
of the greatest contributions to new rehabilitation programming.

Experience at Valley Forge General Hospital during World War II
where a large number of people with severe eye injuries were grouped
for eye care and rehabilitation purposes emphasized the need for expert
ophthalmological guidance in all skill areas. Probably the earliest of all help for the blind in this realm is the human helper,
companion, or guide. Even today, the human guide has an important
role in the orientation and mobility life of the blind, whether he is the
physician in the office, the nurse or aide in the hospital, the parent or
kin in the home, or the friend or stranger on the street and in the
bus, plane, or cab. Yet few people know the principles and philosophy
of guiding, directing, or moving with the blind. This became such a
monumental problem in a hospital setting that a basic set of principles
and techniques were developed by Hoover, Bledsoe, and Tigani14 for
use by those who would be with the blind.

A uniform method of protection was adopted to eliminate the
natural inadequate attempts at groping to which so many people
without sight resort. Either the right or the left arm can be used: the
upper arm is held at right angles to the shoulder and parallel to the
floor, while the forearm is held parallel to the floor at right angles to
the upper arm with fingers extended and relaxed to protect the far side of the body. For even the most awkward this method gives adequate protection against door jambs, posts, and half-opened doors which might damage the face or eyes.

No one should assume that he knows more about the patient than the patient himself does. It must always be remembered that the blind person did not lose his wits when he lost his sight. If he is treated as though he had, it will be reflected in this loss of respect for the doctor and for himself. People have a tendency to shout at those who cannot see. This, of course, is unnecessary. On the other hand, one must not mumble; since the patient depends on his hearing, one should speak distinctly. One knows that he is not doing this if the patient keeps asking one to repeat what was said.

The individual's medical condition should be the physician's primary concern. No matter how well qualified in this area, he should not talk on unexplored subjects. Compensation benefits, state benefits, methods of learning braille, and typing may or may not be foreign, but there are people who know about these things and know how to explain their usefulness. One should especially avoid careless talk about "the wonderful things science is doing." A newly blinded individual may need help in certain areas, but one should remember to give only as much help as is necessary.

It is discourteous to speak to the patient through his kin or through a friend, unless the patient is a child and does not understand the implications of what is being said.

Strangers will often speak to the patient through the doctor if the opportunity arises. If this occurs, the physician should always refer the question to the blind person; this usually can be done very diplomatically.

If the patient is to be guided, the proper procedure is for the guide to ask the patient to take his arm. If it is necessary to make some slight movement to get out of the way or maneuver into position, to sit down or get up, he must direct the patient in doing it. This is not done by shoving, or by propelling. One does not take his hand and move it for him unless it is necessary to show him some particular object, at which time the action is prefaced by saying, "Let me show you."

In directing a patient or person who is blind to do something in the hospital or office, one should be particularly careful to picture carefully what move the patient is about to make in order that exact directions may be given. Special care should be taken to avoid mixing right and left. This is frequently done when one is facing a
person and can cause much confusion. If a patient has been guided to a place and left alone, one should be sure that he understands his location. It is usually better, under such circumstances, to establish some point of contact, such as a counter, chair, table, or wall.

Rarely is anything done well in confusion, particularly in the case of people without sight. This should be kept in mind and pains should be taken at all times to avoid mix-ups, indecision, and upheavals in plans.

The patient or client is as capable of observing the rules of courteous behaviour as he always has been, even though he cannot see. He will expect to shake hands on being introduced but since he will not see an offered hand, it must be presented to him in a way which is comfortable and convenient for him to locate. It should always be made clear when one is leaving a person who cannot see; one should never leave the person talking when he is not there; and he should always tell the patient when he comes back.

The expressions “over there,” “over here,” and “right there,” should be used sparingly. Instead, one uses “Let me show you,” to fill up the time lag until one can establish contact between the patient and the object or chair to which he is directed.

One must be careful in offering examples of what other blind persons can do. An individual must learn about this in a natural way from general conversation. One never knows to what level an individual may rise; therefore, it is unwise to underline the achievements of others in such a way that he feels inferior.

Articles should not disappear from a patient’s reach as if by magic. If it is necessary to move his personal belongings, or some object which he uses regularly, he must be told it is being moved and where.

If entering a confined space such as a small examining cubicle, an examining chair, or an automobile, a person can engineer his own actions better if one hand is placed on something like the door handle or some other familiar object and the other in an area where he might accidentally bump his head. Then the situation will be familiar enough to suggest the whole picture to him. If he becomes confused, further information can be given, but no more than one person should take over in such cases. In public places or in noisy places where there is confusion, a person will need much more help than in quiet, familiar surroundings. Many of the things he ordinarily does with ease in his own environment will become difficult in a different place.

Many well-meaning people try to help the person who is blind but do not know how. Frequent questions of people without sight are,
"Where will I be able to find you?" "How will I get hold of you?" and "Will you be there?" It is very unpleasant for a patient who cannot see to be kept waiting, since he cannot scout for himself when there is a delay. One should always be definite in making appointments, be prompt in meeting him, and give the patient an alternative course of action in case of an emergency which might prevent one from meeting him.

As one observes patients in the hospital setting who have both eyes patched after surgery, are totally blind, or have serious eye trouble so that they cannot see, one notices that eating becomes a great challenge. The nurse or aide should always tell the patient when she delivers the tray to the bed and when she removes it. The tray should be removed as soon as possible after the patient has finished eating. When the tray is brought the patient should be told what is on his tray and where it is. This should be done slowly enough that the patient has time to visualize what is there.

For a new patient food should be served bite size and whatever is not cut in this manner should be so cut by the person who delivers the tray. The plate should be turned so that starchy foods form a wall for slippery foods. Usually this means keeping the starchy food at the left or at the back of the plate. For new patients, bread should be buttered, and, as desired, sugar should be placed in the beverages. Cereals from boxes should be placed in a bowl and sugar and cream put on them; food should be salted and peppered as desired. Although a patient is to receive the service just described, a person who does not regain vision eventually will have to learn to serve himself. Eating skillfully by touch consists mainly in doing things just as seeing people do, but taking pains and paying far more strict attention. Certain tricks common among people without sight may be shown to the patient, although in the main he will develop his own. Suggestions in regard to doing more complicated things for himself may be given to a patient by people who are experts—not while he is eating, but in casual conversation between meals followed by a practical demonstration later. In sugaring food, the patient will find it helpful to let his hand travel ahead toward the dish about to be sugared. This will not only give direction, but the height of the cup or dish toward which he is aiming.

Cutting meat is the most difficult operation for the blind person to perform at the table. Most people who are well-informed on the subject agree that it is not an undue surrender of independence for
this service to be done by someone else, especially if the knife is dull and the meal is to be enjoyed. Food may be salted and peppered by dusting salt and pepper through the fingers extended over the dish. Other people prefer to pour the salt into the palm and scatter it. To avoid the use of fingers, a piece of bread may be used as a backstop in the left hand while the food is taken up onto the fork.

It is usually impossible for a blind person to have a reliable human guide at his beck and call and the only other travel aids in common use are the dog guide or cane. In the west the earliest written evidence of the use of dogs as guides is an account by Trevisa in *The Olde English Translation* (1398) from the comments of a monk named Bartholomew on contemporary life about 1260: “The unfortunate conditions of a blind man are so great, that it makes him not only subject to being led by a child or by a servant but also by a dog.”

The modern story of dogs as guides for the blind originated with Dorothy Harrison Eustis, who bred and trained dogs for specialized duties in the Swiss army and who in 1927 wrote an article for the *Saturday Evening Post* telling of her observations on the use and training of shepherd dogs in Germany to lead blinded German veterans of World War I. Mrs. Eustis trained the first dog to be used by a blind American. Her article entitled “The Seeing Eye” so caught the fancy of the public that most people refer to all dogs guiding blind people as seeing eye dogs.

There are about a dozen guide schools in the United States, but the largest and best of its kind in the world is The Seeing Eye, Inc. at Morristown, New Jersey. Only its trained dogs can be correctly termed Seeing Eye dogs. The Seeing Eye, Inc. is in its thirty-eighth year and has placed approximately 3100 trained dogs with blind travelers. Even if all schools were of equal duration and caliber, it is apparent that there is still need for travel aids and techniques to accommodate the many thousands newly blinded each year. In 1960 the Research Center of the New York School of Social Work prepared a study called, “The Demand for Dog Guides and Travel Adjustment of Blind Persons.” This study points out the desire of most blind people to improve their travel performance and the lack of active plans on the part of most to accomplish this. It further demonstrates a surplus of facilities for dog guide programs, while cane programs are in insufficient supply to meet existing needs.

The use of electronic, ultrasonic, and mechanical equipment as guiding devices for the blind appeals to the motorized and mechanized
public so that considerable effort and publicity has gone into the research and possible development of such aids, either as supplements to or replacements for the human, dog, or cane as travel guides and aids. The original research began as a result of early experiments by the author and Colonel Gordon Chambers in the use of an interrupted light source which directed its beam at an object. The reflection of the light source was captured and transformed into audible signals which by proper coding could measure (within certain limits) the distance of an object from the traveler. This idea was transferred to the Signal Corps of the United States Army and under the supervision and direction of Cranberg and his colleagues, the first prototypes of this device were produced and field tested. At about this same time, in January of 1944, the Committee on Sensory Devices of the National Research Council, under the chairmanship of George W. Corner, had its first meeting. This committee arranged contracts with the Brush Development Company, the Hoover Company, the Stromberg-Carlson Company, and the Franklin Institute of Philadelphia, each of which developed portable instruments of sufficient power to permit ranging for later testing at Haskins Laboratories. From this simple beginning has stemmed a large and complex research and development program.

In general there are two types of device being studied: energy radiating devices, which must be very thrifty in their expenditure of energy, and passive or ambient devices which require less energy but have high false alarm rates. Current devices are experimental and must be recognized as environmental sensors or object detectors which might become especially useful as supplements to the cane or dog guide.

The proper cane used correctly can be the most valuable aid yet available to the majority of the “blind.” One must remember it is only an aid, and that to travel competently from place to place, the blind cane user must not only be familiar with the cane touch technique but must be able to listen and use what he hears. Most blind travelers say that hearing is the most valuable orientation sense. Underdevelopment or lack of such clues either from ignorance, pathology, or unawareness prevents top-quality orientation to one’s surroundings. The tactile

sense transmitted primarily through the fingers, hands, and feet and through the cane to the fingers and hand is also a valuable orientation and travel tool. It must also be isolated, developed, and taught. It is obvious the olfactory sense can also be useful. Many establishments such as bakeries, markets, barber shops, flower stands, and candy and peanut shops can give valuable orientation clues to the blind travelers. Proper training techniques can also improve the use of this sense.

Even if all senses are exceedingly acute and superbly trained, the blind traveler still needs to know first whether there is a safe platform on which to step and whether there are objects in the path which would lead to injury or embarrassment if undetected and negotiated. This is just what the correct cane properly used can tell him.

In trying to teach techniques in the use of the cane as a travel aid to hundreds of the newly blinded it was soon discovered that the customary white cane was inadequate. Similarly, individual systems developed by some blind travelers could not be universally adopted. An attack on these two problems was made by the author and his staff. The design and characteristics of the perfect cane were analyzed. First of all, it should be just long enough to inform the user of a safe spot on which to place his next step, a length that will differ with each traveler. It must be light in weight so as not to cause fatigue. There should be a grip, crook, or handle which allows ease of handling and perfect control without finger cramps, palm sweating, or annoyance from extreme temperatures. There should be a durable tip which does not wear too rapidly or stick too badly when being touched to terrain, but which dampens none of the desirable tactile and audible information it should be reporting. The shaft itself should be durable and properly conductive—transmitting tactile and audible clues but avoiding undesirable or dangerous conduction such as electricity, cold, heat, and unnecessary noise. It would be convenient if it were telescopic or easily collapsible to allow for easy storage when not in use—as in trains, buses, planes, restaurants, and china shops. If possible it should be attractive. The color is individual and not necessarily white. The white cane, such a popular image of the blind in this country, was adopted as a national promotion project by the International Lions Club Convention in Toronto in 1931. As a result local ordinances and state laws have been passed concerning their use and significance. But blind persons who wish instead to use canes of other hues are at liberty to do so, and their own skill and judgment in managing the cane can be much more dependable than the dubious advantage of being spotted by a motorist on a modern highway. The
cane is currently regarded as a symbol of independence and not one of dependence. Its value now lies in its proper use and not in its specific color.

After more than twenty years of interest and probably less than fifty dollars in direct research there is not yet the utopian cane. However, through the interest of the Somerill Tubing Company's executives and engineers at Norristown, Pennsylvania, canes were designed, built, and supplied in numbers to the eye service at the Valley Forge General Hospital. The canes met most of the necessary specifications; however, modifications and innovations of this original design have been numerous.

The problem of finding a technique that made the best use of a good cane remained. The user needed to determine the presence of a safe platform on which to step, to avoid all dangerous and embarrassing objects from the waist down, and to determine steps down and steps up. The cane makes no claims to find objects hanging from above, to maintain balance and direction, to plan directions, or to otherwise fulfill the requirements of muscle, nerve, hearing, smell, or touch other than that immediately conveyed as the cane touches the terrain with each step taken. It can be used as a bumper in certain areas and under certain conditions and there are designated techniques for this specialized use. Its real value is in negotiating ever-changing and unfamiliar environments.

When the cane is used in an uncontrolled environment the hand gripping the cane is dropped in a natural position to the side. The dorsal aspect of the elbow is then rotated inward slightly so that it rests firmly on the hip bone, and the hand holding the cane moves to a comfortable, moderately relaxed position in the very center of the body slightly below waist level and very close. The cane is held at the proximal end with the weight supported comfortably against the thenar eminence and guided largely by the thumb and index finger. With the forearm remaining stationary the hand moves back and forth pointing the cane so that the tip describes an arc before the user. This arc should never rise more than one or two inches above the ground and should always touch the spot where the advancing or rear foot is about to be placed, thus ensuring that there is no obstruction but solid safety for the advancing foot.

If a traffic intersection is to be negotiated the orientation and techniques are very specific and involved and will not be detailed here. However, since ascending or descending steps is often a hair-raising
experience even for the normally sighted, the somewhat condensed description of technique is included to show the logic and safety involved.

When the tip of the cane indicates the presence of a drop or a step down, the first thing which must be ascertained is the depth of a step. This should be done by putting the cane down on the second step and moving forward until both toes extend over the edge of the step the same distance when the heels are parallel. In this way good direction is obtained. If there is a succession of steps, the next important thing is the width of the tread, which is found by moving the tip of the cane forward until the edge of the second step is located. Then, it is important to know if there is a margin of safety on either side in order that one may not step off the side in case there is no wall or banister. This is done in one sweeping motion of the tip of the cane along the edge of the second step from about twelve inches past the left side of the body to approximately twelve inches past the right side of the body. Now the traveler is ready to descend, with the hand holding the cane falling naturally at the side and the tip of the cane extending past the edge of the second step and two or three inches in front of it. The cane and hand are held motionless, the traveler tilts the head forward as if looking where he is going, for this gives better balance, and descends with a relaxed, normal gait. If the cane and hand have not been moved during the descent, the tip of the cane will touch when the bottom of the steps has been reached. The foot/cane rhythm is then resumed.11

This does not complete in detail all the intricacies of cane use, but it is specific enough to familiarize the physician with the mechanics and notion of the cane's design, characteristics, and effectiveness.

So important has this concept of orientation and mobility become that in 1960 the Vocational Rehabilitation Administration of the Department of Health, Education, and Welfare sponsored the first school of peripatology to be founded—in the School of Special Education at Boston College. This educational program and training leads to a master's degree in special education. Since then, departments have also been established at Western Michigan University and California State College at Los Angeles. Others are in prospect and interest in undergraduate training in this speciality is also beginning to prosper. This means that qualified instructors with master's degrees will soon be available in agencies, schools, centers, and hospitals to supervise, direct, and teach these important skills.
The literature is scant concerning the role of the ophthalmologist in relation to the social and emotional adjustment of his patients. Cholden\textsuperscript{3} presented one of the few systematic treatments of this problem. The Research Center of the New York School of Social Work, Columbia University, attempted to determine by questionnaire if there was fairly consistent agreement among ophthalmologists on a core of rehabilitative concepts and principles. The profile of majority concepts listed below could be used as a set of standards for the ophthalmologist interested in rehabilitation care.\textsuperscript{7}

1. A broad concept of the role of the ophthalmologist is held, one going beyond specifically medical concerns. Positive attention to the long-range social and psychological adjustment of blind persons is held to be an ophthalmologist’s concern.

2. The ophthalmologist has awareness and concern for such problems accompanying blindness as economic need, impaired travel ability, psychological difficulties in adjusting to blindness, and difficulties in relating to people.

3. Information to patients as to the condition of blindness should be given early, so that rehabilitative measures may be begun as soon as possible. The manner of informing patients should keep individual characteristics and situations in mind.

4. Hope for recovery should not be left when the condition of blindness is clear and irreversible, as it will interfere with readjustment and rehabilitation.

5. The ophthalmologist has the major responsibility for informing the patient of his condition, though he may also enlist the aid of others.

6. Expectations for the social role of blind patients should be similar to those for sighted persons, with optimism as to the possibility for reasonably happy and useful living. Specifically, economic self-support, emotional independence, and satisfactions in work and in relations with others are held to constitute elements of the satisfactory adjustment of blind persons, just as they do for sighted persons.

7. Active referral of patients for social rehabilitation services of various kinds, including travel training, is favored. Guidance, referral, and continued interest in the adjustment of blind patients are considered to be important accompaniments of practice in informing patients of blindness.

Cultural stereotypes of the blind man either make him out a beggar, a complete dependent, social and economic inferior, or portray him
as a blind genius who can tell colors, has facial vision, can do "the most extraordinary and wonderful things," and has unusual hearing, tactile, and perceptive abilities which the seeing do not have. Unfortunately, the first stereotype is the most prominent so that sighted people feel that life and social position as a blind man may be untenable.

The doctor may feel blindness to be a loss of his own self-esteem and prestige or a damaging reflection to his professional reputation. It is certainly important that the ophthalmologist's attitude toward blindness should be clear; otherwise, it will further confuse the already devastating picture blindness has for the patient. It is difficult to tell a person he is irrevocably blind. It is easier to insinuate or hold out a hope that the person may some day see again through a medical or surgical miracle. Hope for recovery, so important therapeutically in most aspects of medicine, is a cruelty to the permanently blind and a major deterrent to his adjustment.

The physician is by training and service a humanitarian, and his motivation in holding out a hope of seeing is quite humanitarian. He does not want to be cruel at any time, and especially in the intimate confines of the hospital room or office, he finds it cruel to condemn anyone to a blind person's life of dependency. At the same time, he is in a key position to inspire the blind person to improve or rebuild his life. This he must do with knowledge, courage, conviction, and simplicity. The patient can sense a doctor's attitudes and convictions. With the secure knowledge that there are ways, means, devices, and activities with which the blind can continue to be socially and economically productive and emotionally stable, he need not view a blind man's lot as one of uselessness.

CONCLUSION

In conclusion, it should be reemphasized that the ophthalmologist can have an important role in developing new concepts for the rehabilitative care of the visually impaired.

The departure from traditional approaches to rehabilitation therapy for the blind as experienced and performed in a hospital center in the 1940s met with opposition, especially as it related to the need for improvement in communicative and mobility skills.

With support from a few ophthalmologists and the use of new techniques and aids centered around orientation and mobility, the blind section at the Veterans Administration Hospital, Hines, Illinois, operates
as the living proof of the merits of this new concept and of the value of this new therapy. Its current dynamic importance is reflected in plans by the Veterans Administration to open other centers of a similar kind. It is further demonstrated by the organization of graduate schools of orientation and mobility at Boston College, Western Michigan University, and California State College at Los Angeles and by the persistent demand for graduates of these programs as instructors in schools, communities, agencies, hospitals, workshops, and rehabilitation centers.

REFERENCES

15. Peckham, R. H., The Visual Responses of the Partially Sighted, Division of Vocational Rehabilitation Administration of Department of Health, Education, and Welfare, Contract no. RD 1382-S.