Journal of Gerontology: MEDICAL SCIENCES
2004, Vol. 59A, No. 11, 1132–1152

History

A Brief History of Geriatrics

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> ''History is the high point of advantage from which alone men can see the age in which they are living.''
>
> —*G. K. Chesterton*

IN the end, each of our endeavors is only a product of those who went before us trailblazing the path to the present. For this reason, I believe it is useful to reflect on the history of the origins of geriatrics. Any such history that is to be compressed into an article must perforce be truncated. In addition, history is always seen as interpreted through one's own perspective, and history is not always as it appears. Finally, I have lived an active role in much of the last two decades of American geriatrics, providing me, to some extent, with a biographer's viewpoint, rather than that of an uninvolved student of the field.

Mythology and the Development of Anti-Aging Theories from Ancient Times to Cloning

> ''Then the Lord God said, ''See! The man has become like one of us, knowing what is good and what is bad! Therefore, he must not be allowed to put out his hand to take fruit from the tree of life also, and thus eat of it and live forever.' The Lord God therefore banished him from the Garden of Eden, to till the ground from which he had been taken. When he expelled the man, he settled him east of the Garden of Eden; and he stationed the cherubim and the fiery revolving sword, to guard the way to the tree of life.''
>
> —*Genesis 3:22–24*

Since the beginning of time, myths concerning the aging process, and the struggle to overcome or accept death, have been a component of the oral history of *Homo sapiens*. Thus, when Prometheus stole fire from the Gods, and brought it to earth, he was punished by being hung from a cliff where the vultures pecked at his liver. However, because of the regenerating powers of the liver, he survived, eventually to be set free. For accepting the gift of fire, the Gods punished humanity by sending Pandora with her box. When insatiable curiosity caused the box to be opened, plagues, diseases, and old age were released among humans.

Another tale is that of Gilgamesh, the Babylonian demigod, who, when he aged, and began to fear death, was told that he could survive forever if only he could master sleep by not sleeping for 7 days. When he failed to do this, the gods told him that he could find a plant underwater that, if he ate it, would make him immortal. Gilgamesh found the plant but was enjoying swimming so much that he left the plant on the shore while he continued swimming. A snake came along and ate the plant. The lesson to be learned was death is inevitable.

Both Taoism and Ayurvedic medicine had their anti-aging theories. The Taoists believed that if you learned to undertake effortless action, take vital breaths, ''starve the three worms,'' and eat magical foods, such as ginseng, you could slow down the aging process. Ayurveda comes from Ayus meaning ''life'' and veda meaning ''science.'' Ayurvedic medicine taught that transcendental detachment together with certain herbs would postpone aging. In modern times, Deepak Chopra has utilized these tenets to write a best selling anti-aging book (1). In ancient Egypt, the ''Edwin Smith'' *Surgical Papyrus* (600 B.C.) included ''the book for the transformation of an old man into a youth of 20.''

Mythology has also pointed out the problems of immortality in the story of Tithonus (Figure 1). Tithonus was the morning lover of the goddess of dawn, Aurora. He was apparently so good at what he did for her that she went to her father, the god of gods, Zeus, and asked if Tithonus could have eternal life. Zeus, being a doting father, immediately granted Tithonus immortality. The problem is that she had not asked for eternal youth. So, over time the aging process took its toll and when Tithonus reached 100, he had mild cognitive impairment and went around Aurora's castle babbling incessantly. She no longer loved him and one day she turned him into a grasshopper (cicada). So today when we hear the chirping of cicadas, it is just a group of old men babbling incessantly!

Three origins of the concept of the Fountain of Youth are found in the literature. The first was the belief that a river of immortality flows from the Garden of Eden. The second was the Indian story of Ayavanna who, in return for teaching religious secrets to the demigods, the Asvins, was shown the Pool of Youth. This legend was the origin of the early 20th century novel about Shangri-la and the more modern story that the people of Hunza lived to an excessive old age. The third story is that of the cook of Alexander the Great who, while preparing a fish in a river, saw it miraculously restored to life. This river became known as the ''water of life.'' But the cook refused to show it to Alexander and was put to death! Tales such as this led Ponce de Leon, the governor of Puerto Rico, to search for the ''Fountain of Youth'' on the magical isle of Bimini (Figure 2). Instead, he found Florida, and many of my patients clearly believe he was successful,

as during the winter months they eschew the care of the good doctor and flee south to the warmer climate in Florida!

In 1975, Alexander Leaf published his book on how persons living in Georgia (Russia), Hunza in the north of the Asian subcontinent, and Villacabamba in Ecuador, lived for extraordinarily long times (2–4). He attributed their survival to exercise and good eating habits, creating the wave of dietary restriction recommendations for longevity. Unfortunately, it turned out that the reputation of these folk for longevity was based perhaps in part on hard work, a Spartan diet, regular exercise, regular fiber and little cholesterol, but most important, the inability to count correctly! Birth certificates were found to be wrong and age based on crude and inaccurate counting practices.

The first anti-aging dietary regimen was invented in Battle Creek, Michigan, in the 19th century by two competitive preachers. Kellogg and Post both invented their cornflakes as a food that would prevent the travails of aging and bring ''man closer to God.'' This was around the period that the Reverend Alcott was preaching that an infirm old age was God's punishment for sinning.

Other anti-aging theories of note during the 20th century include that of Elie Metchnikoff, the Nobel prize winner who believed aging was due to bacterial toxins released from the intestine. He believed that Bulgarians lived especially long lives because they ate yogurt. He thus touted yogurt as an anti-aging medicine. These theories survive today in the modern science investigating the utility of probiotics to treat disease (5). Metchnikoff coined the erroneous term ''gerontology'' for the science of aging. *Geronte* is French for ''man'' and thus has nothing to do with aging. The appropriate term would have been ''geratology,'' as pointed out by Professor Grimley Evans (6).

Cell therapy (parenteral injection of fetal cells) was invented by Paul Niehans in Switzerland. It was tried by such luminaries as Winston Churchill and Pope Pius XII to ward off the aging process. In 1949, Ana Aslan in Roumania invented Gerovital H3, a procaine-based medicine that inhibited the aging process. With the money she made from this invention, she founded the Institute of Geriatrics in Bucharest in 1952 and became a well-respected member of the international gerontological society (7).

In 1934, Clive McKay published on the ability of dietary restriction to prolong life in rodents (8). This anti-aging concept was explored in detail by Edward Masoro and his colleagues (9). Modern studies have examined its utility in primates (10) and in humans (11). In 1957, Denham Harman proposed the free radical theory of aging (12). This theory has many proponents today with numerous scientific studies suggesting that free radical inhibition may slow the aging process (13–15).

Perhaps the greatest impetus for the modern ''merchants of immortality'' came from Len Hayflick's finding that there were a finite number of times a fibroblast could divide in vitro. This eventually became known as the ''Hayflick Limit.'' The original article by Hayflick was rejected by the *Journal of Experimental Medicine* with a scathing letter from the editor that stated, in part, ''The largest fact to have come from tissue culture research in the last fifty years is that cells inherently capable of multiplying, will do so indefinitely if supplied with the right milieu *in vitro*.'' It was eventually published in *Experimental Cell Research* in 1961 (16). It was these findings that led, in 1985, to Carol Greider and Elizabeth Blackburn discovering telomerase (17). This led to the foundation of Geron, the first anti-aging mainstream pharmaceutical company by Michael West (18). Subsequently, we have seen the cloning of the sheep, Dolly (19), and claims that ''scientists rewind the aging clock in cloned cows'' (20). Claims by a quasireligious sect, the Raelians and their biotech company (Clonaid), that they cloned a human being, while sensational, have not been shown to be scientifically valid.

Today the anti-aging industry is alive and well, utilizing a number of scientific facts blended with quasiscientific truths and driven by the continuous quest for the ''Holy Grail of Immortality.'' Numerous complementary and alternative medicine products and techniques are regularly used by older persons (21–23). The Journals have published a number of articles pointing out the pitfalls of the anti-aging industry (24–26). However, it would seem that, as long as humans are unprepared to ''go gentle into that good night,'' the anti-aging industry will continue to be driven by market forces (27).

Prehistory of Geriatrics

The hieroglyphic for ''old'' in ancient Egypt (2800 B.C.) was a bent person leaning on a staff—perhaps the first depiction of the ravages of osteoporosis. In 1550 B.C., the Ebers Papyrus suggested that ''debility through senile decay is due to purulency on the heart.''

Hippocrates felt that old age was cold and wet. This was perhaps driven by his recognition of the effects of cardiac cachexia and understanding that cardiac failure occurred commonly in old age. Galen (10 A.D.), whose theories were to hold sway through many future centuries, felt that old age was cold and dry. Cicero expounded on old age in *De Senectute*. He offered much common sense advice and was most probably first to recognize the syndrome of anorexia of elderly people (Figure 3) (28).

Roger Bacon (c. 1214–1294), a Franciscan friar, wrote a book on aging where he suggested that old age could be warded off by eating a controlled diet, proper rest, exercise, moderation in lifestyle, good hygiene, and inhaling the breath of a young virgin (29). This belief most probably came from the biblical story of King David sleeping between two virgins when he was old to restore his youth. Benjamin Rush in 1805 published the articles, ''On the Condition of the Body and Mind in Old Age'' and ''Remarks on the Diseases of Old People.'' George Edward Day (1815–1872) wrote a common sense book from the physician's perspective on aging in 1848. He complained that other physicians had little interest in caring for the ills of the aged (Figure 4). This refrain still rings true during the first few years of the 21st century. Charcot's ''Clinical lectures on Senile and Chronic Diseases'' is often cited as being a seminal text in geriatrics. This, I believe, is more related to the importance of Charcot than the quality of the text. Table 1 lists a number of texts on aging published through the middle of the 20th century.

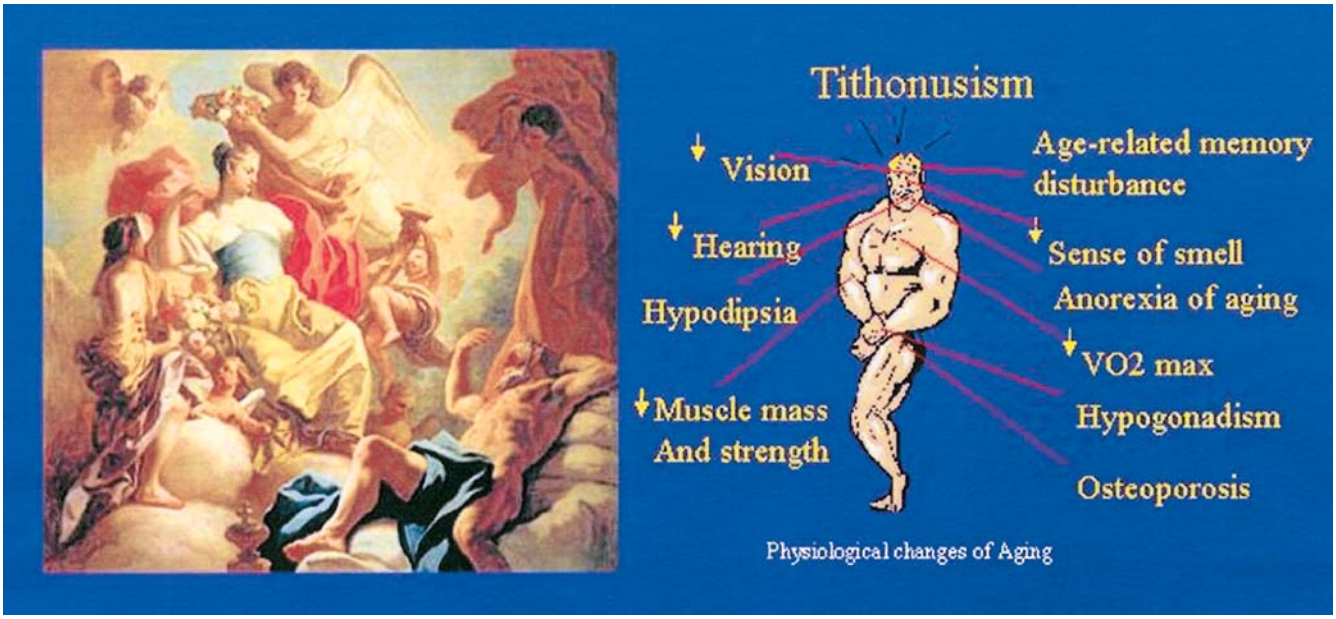

Figure 1. (**Left**) Aurora, goddess of the morning and Tithonus, Prince of Troy painted by Francesco de Mura in the 18th century. [Reprinted with permission of the National Museum of Castel Sant'Elmo, Naples, Italy.] (**Right**) Tithonusism or the physiological changes of aging.

Toward the end of the 19th century, the concept of hormonal reversal of aging processes began to develop (30). In 1886, Victor Horsley felt that older persons resembled myxedematous monkeys and that thyroid deficiency could result in ''mere senility'' (31). Horsley was a neurosurgeon who did the first laminectomy for spinal cancer, and the transcranial approach to the pituitary gland. He also played a major role in the eradication of rabies from England.

Brown-Sequard, at the age of 70 years, found that he was getting tired at night and introduced the first testicular extract injections for rejuvenation (Figure 5). This led to Victor DeLespinasse at the University of Chicago doing human testicular transplants. The shortage of humans wishing to donate a testis to be transplanted led to Serge Voronoff introducing ''monkey-gland'' transplants to rejuvenate the aging rich. In Kansas, Brinkley tried goat testicular transplants (32). These are the historical precursors to the modern use of testosterone replacement therapy for the andropause (33,34).

The Birth of Geriatrics

Modern geriatrics was born with the invention of the word ''geriatrics'' by Ignatz Leo Nascher (Figure 6). Geriatrics was derived from the geronte, a group of men over 60 years who ran the legislative council (gerousia) of Athens. Nascher was born in Vienna in October 11, 1863. He graduated as a pharmacist in 1882 and then obtained his medical degree from New York University in 1885. He wrote a number of articles on geriatrics (35,36) and a book, published in 1914, *Geriatrics: The Diseases of Old Age and Their Treatment*. He retired in 1929 at the age of 66. His interests in geriatrics and his development of treatments for older persons almost certainly came from visits to Austria where care of elderly people was blossoming at the time.

Nascher's interest in geriatrics is even more astonishing as he was a contemporary of William Osler, the famous Canadian physician who was chairman of medicine at Johns Hopkins in Baltimore. Osler appeared to be remarkably ageist as shown in his final address called, ''The Fixed Period,'' where he stated that men over 40 years were relatively useless, as they were beyond the golden age of 25 to 40 (37). Men over 60 years were considered absolutely useless, and chloroform was not a bad idea for this age group. This address is said to have been responsible for a number of suicides. Whether or not Osler meant his address to be taken seriously is unknown. He was a notorious practical joker who, writing as Eggerton Yorrick Davis, created a number of mythical medical syndromes such as ''vaginismus''—a condition in which the female vaginal muscles captured the male organ (penis captivis), not allowing it to escape following intercourse (38).

The Development of Modern Geriatrics—The United Kingdom

Marjory Warren (1897–1960) is given much credit for the development of modern geriatrics. In 1935, she took over the aged beds at the West Middlesex Hospital (39). Among her innovations was to enhance the environment, introduce active rehabilitation programs, and emphasize increased motivation on the part of the older person. She wrote 27 articles on geriatrics (40).

Lionel Cosin was an orthopedic surgeon who worked in Orsett in Essex. He became successful at rehabilitating older persons after surgery for hip fracture. His motto was ''bed is bad'' (41). The first daycare hospital was introduced in Oxford in the 1950s (42). The problems associated with immobility were encapsulated in a poem by one of his contemporaries, Richard Asher (Figure 7). Eric Brooke at

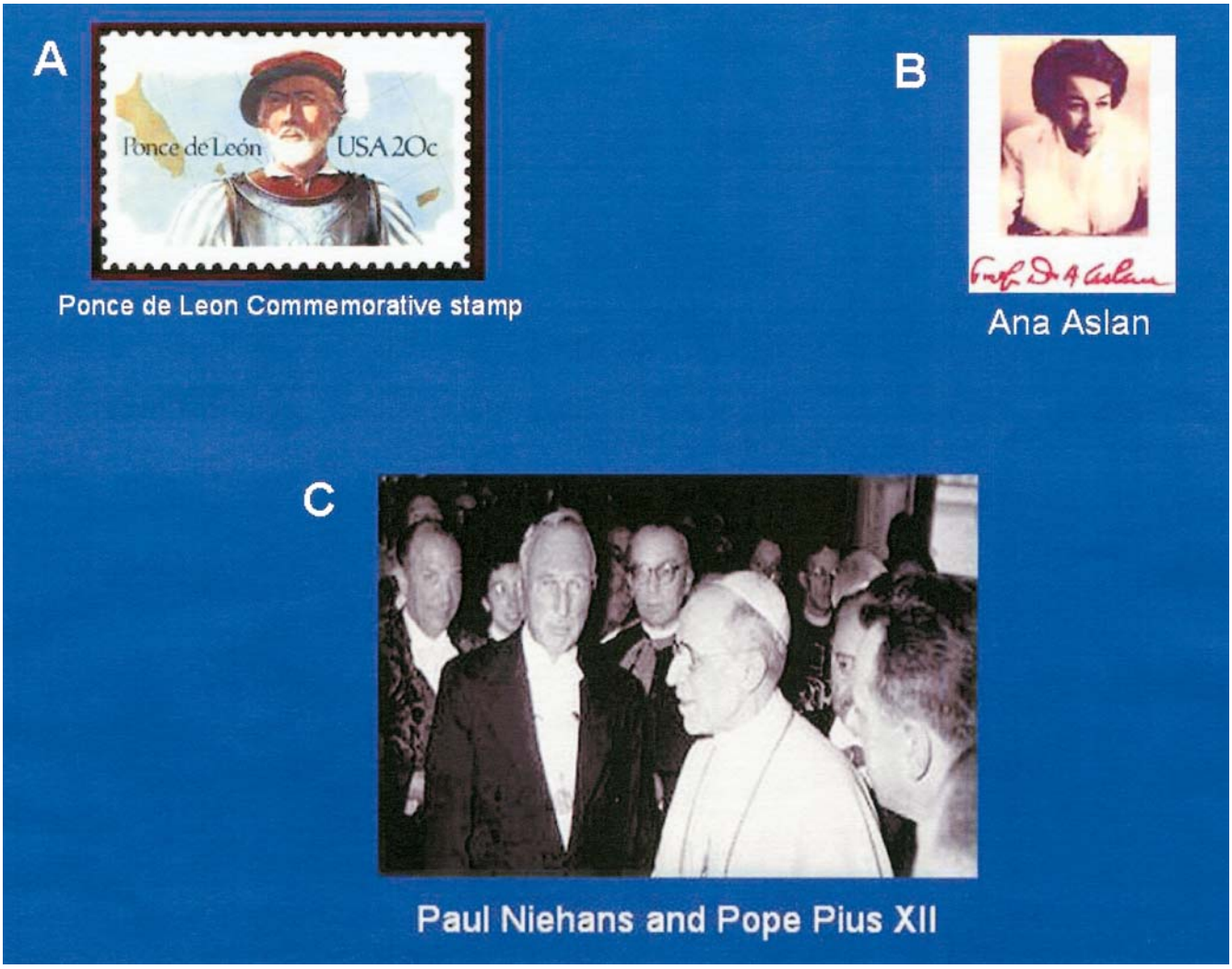

Figure 2. (**A**) Ponce de Leon stamp; (**B**) picture of Ana Aslan and her signature; (**C**) Paul Niehans and Pope Pius XII.

St. Hellier Hospital in Charston introduced the concept of domicillary (home) visits for rehabilitation of elderly persons. Trevor Howell, while working at the Royal Hospital Chelsea, published his research on the physiology of aging in 1944 in a book entitled *Old Age* (43).

Joseph Sheldon (1893–1972), while working at the Royal Hospital in Wolverhampton, undertook a survey of 583 old people, which he published in his book *The Social Medicine of Aging* in 1948 (44). He introduced home physiotherapy and promoted environmental modification to prevent falls.

A seminal event in British geriatrics occurred in 1946 when Lord Amulree and Dr. Sturdee addressed the Houses of Parliament on the care of the aged and chronic sick. This led to the inclusion of the care of the aged as part of the National Health System. The travails of the social care of elderly people in the United Kingdom have been recently reviewed in a Future History article in the Journals (45).

The first meeting of the ''Medical Society for the Care of the Elderly'' was called by Trevor Howell (46). The others in attendance included Eric Brooke, Alfred Mitchell, Lawrence Sturdee, Thomas Wilson, George Adams, Lionel Cosin, and Marjory Warren. Lord Amulree was elected president and remained in that position for the first 25 years. In 1959, the society changed its name to the British Geriatric Society.

The first chair for geriatrics in the world was the Cargill Chair at Glasgow University awarded to Dr. Ferguson Anderson in 1965 (47). It was Brocklehurst and Pathy who separately codified the basic principles of geriatrics in their textbooks (see Table 2 for the major modern geriatric texts). Bernard Isaacs (1924–1995) not only led the development of stroke units (48), but also created the term the ''Giants of Geriatrics'' to designate the major geriatric syndromes, viz., instability, immobility, intellectual impairment, and incontinence (49). Alex Comfort, more famous perhaps as a novelist and for writing *The Joy of Sex* (1970), was the great propagandist for aging research in Europe in the middle of the 20th century (50). His early research was on aging in *Drosophila* and thoroughbred horses. He then attempted to determine biomeasures of physiological aging (51,52). In 1965, he became the founding editor of *Experimental Gerontology*.

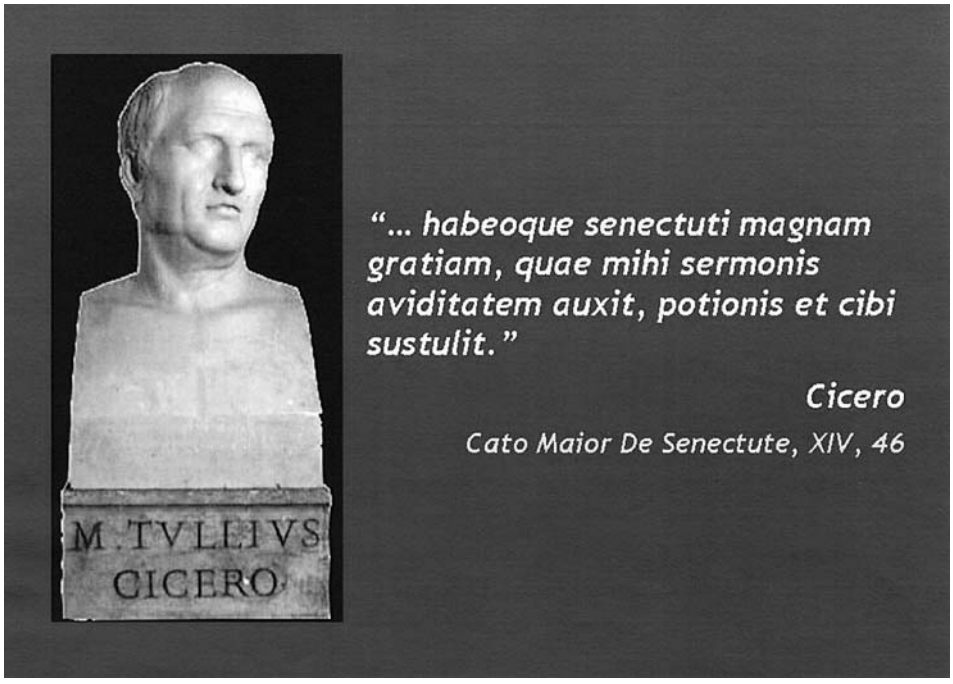

Figure 3. Cicero together with the first quotation recognizing a physiological anorexia of aging. ''I am grateful to old age as it has made me less interested in good food and more interested in good conversation.''

Thus, while the term ''geriatrics'' had been birthed in the United States, it was the British who created the basic principles of the discipline. However, it was to take researchers in the United States to provide the scientific validation of the British methods and provide the next steps forward in the development of the sciences of geriatrics.

The Development of Modern Geriatrics—The United States of America

Before reviewing the development of modern geriatrics in the United States, it is of use to review a number of key early events in the social condition of elderly people. These start with the military pension scheme in 1861 associated

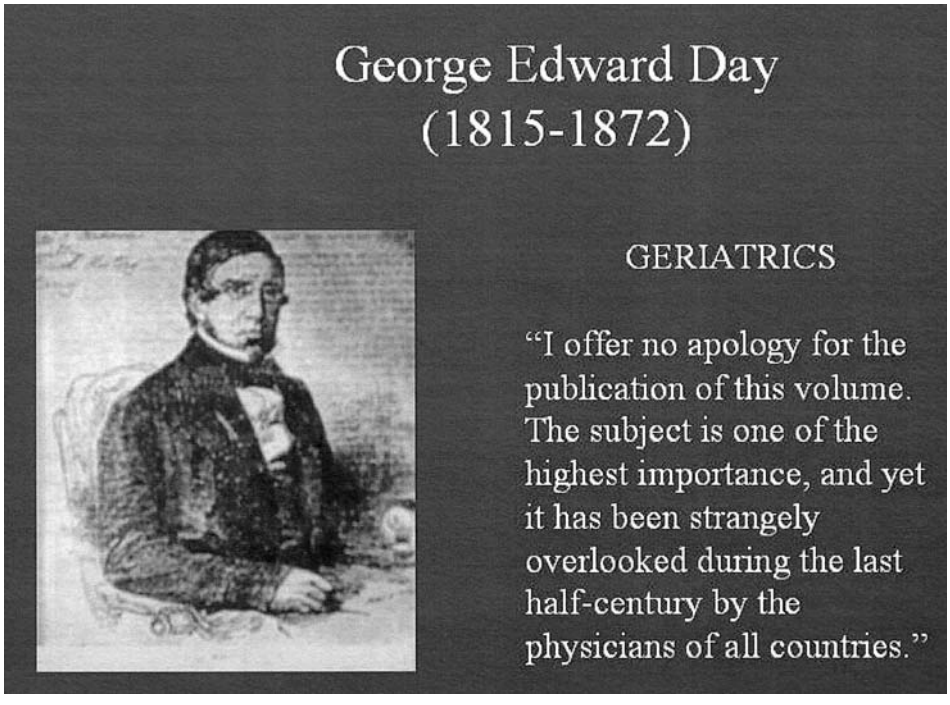

Figure 4. George Edward Day (**A**) and a quote from his book *Disease of Advanced Life* (1848) (**B**).

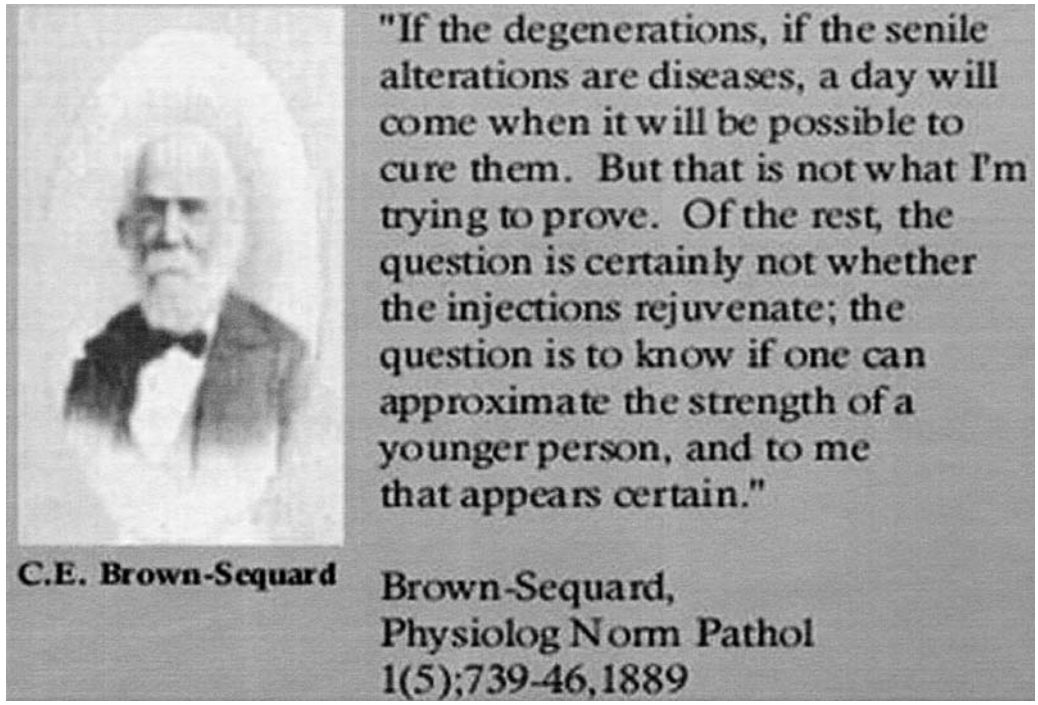

Figure 5. Brown-Sequard and a quotation from his article on the effects of testicular injections.

with the Civil War. The Great Depression led to large numbers of elderly poor in the United States: 30% in 1930 and 66% by 1940. This was slowly rectified by the passage of the Social Security Act in 1935 under President Roosevelt. In 1950 the first National Conference of Aging was called by President Truman and it was followed in 1961 by the 1st White House Conference on Aging. At this time, the Senate Special Committee on Aging was established, but only obtained permanent status in 1977. In 1965, Medicare and Medicaid were introduced, providing finances to drive high-quality medical care for older persons.

Edmund Vincent Cowdry (1888–1975) was born in MacLeod, Alberta, Canada (Figure 8, Table 3). He received his BA from the University of Toronto in 1909 and MD from the University of Chicago in 1913. In 1936, he was appointed a Professor of Cytology at the Washington University in St. Louis. He was active in aging research, particularly as it related to atherosclerosis (53). In 1939, he edited *The Problems of Ageing: Biological and Medical Aspects*, and produced two other books, viz., *The Case of the Geriatric Patient* (1958) and *Aging Better* (1972). He was a champion of the special medical needs of elderly persons and opposed the American Medical Association by advocating special care needed for geriatric patients.

The Club for Research in Aging was established in 1939 with support from the Josiah Macy Jr. Foundation. When Mrs. Kate Macy Ladd formed the foundation, she chose aging as one of the five areas to be focused on for future support. Its leadership included V. Korenchevsky and Cowdry. (As an aside, Korenchevsky, who was born in Russia in 1880, also played a major role in the development of geriatrics in Britain by convincing Lord Nuffield and his foundation to fund geriatric research units at Oxford, Cambridge, and Leeds.) As we will see, the development of geriatrics has depended heavily on support of private foundations. Out of this group grew The Gerontological Society of America, which was founded in 1945 with 80 members (54). William MacNider was the first president. *The Journal of Gerontology* was first published in 1946 and, in 1988, was split into four separate sections under one cover, representing the diverse interests of the membership. In 1995, it was split into two separate covers, with biological and medical sciences coexisting as one volume and psychological and social sciences as the other. *The Gerontologist* was first published in 1961. The winners of the medical sciences section, Joseph T. Freeman Award, are listed in Table 4.

The American Geriatrics Society was organized on June 11, 1942, at the Hotel Brighton in Atlantic City by Malford W. Thewlis. The first annual meeting was held in 1943 with Lucien Stark of Norfolk, Nebraska, as president. In 1953, the *Journal of the American Geriatrics Society* was published under the editorship of Willard O. Thompson (55,56). *Geriatrics* had been first published in 1946 with an association with the American Geriatrics Society, but the publisher held title to the name and the journal continues to be published today. The winners of the Nascher/Manning Award for Lifetime Achievement in Geriatrics, given by the American Geriatrics Society, are listed in Table 5.

In 1940, Edward J. Stieglitz was appointed the first head of the Unit on Aging with the Division of Chemotherapy at the National Institutes of Health. The unit was originally funded by a $10,000 grant from the Josiah Macy Jr. Foundation. The following year, the unit moved to

Baltimore City Hospital under the leadership of Nathan Shock. This lead to the establishment of the Baltimore Longitudinal Study on Aging in 1958. For many years, this program was successfully led by Reuben Andres, who created a generation of geriatric researchers (57,58). In 1941, Thomas Parran, the Surgeon General, formed the National Advisory Committee on Gerontology. In 1948, the gerontology branch was moved under the National Heart Institute. Dr. Henry Simms had tried hard to have an Institute of Aging established with Heart as a subsidiary, but this failed, as a physician to the Senate stated, ''We don't need research on Aging. All we need to do is go into the library and read what has been published'' (59). This contrasts with Nathan Wetherwell Shock's own viewpoint enunciated first before his death in 1989: ''I would remind you that we were formed and nurtured in the firm belief that the biological phenomenon we call ''aging' was worthy of scientific pursuit. We have achieved some degree of success. I would caution, however, that our future will be determined only, and only, by the quality of our scientific research on understanding the basic mechanisms of aging processes'' (60).

In 1959, James E. Birren was appointed the first head of the Section on Aging of the National Institute of Mental Health. On May 31, 1974, the Research on Aging Act (PL93-296) established the National Institute on Aging (NIA) with Robert Butler becoming the first director. T. Franklin Williams became the second director in 1983. Gene Cohen was acting director for 2 years before Richard J. Hodes became the third director in 1993. The first two directors of the NIA had a major national impact, whereas Hodes, a basic scientist, has been much less prominent on the national scene.

The true giant of medical geriatrics in the United States was clearly Les Libow (Figure 9) in New York at the Jewish Home and Hospital for the Aged. He was responsible for creating the first fellowship in geriatric medicine at City Hospital Center (a Mount Sinai School of Medicine affiliate) in 1966 (61,62). He introduced resident rotations in geriatrics and started a teaching nursing home in 1967 (63–66).

Perhaps the single most important institution in the development of geriatrics in the United States has been the Veterans Administration (VA) (67). This was due to recognizing the marked increase in aging veterans and its potential effects on the veteran's health care system. The first Geriatric Research, Education and Clinical Centers (GRECCs) were opened in 1976. Paul Haber was responsible for Congress authorizing the creation of the GRECCs. These institutions played a major role in developing geriatric faculty, science, and education at major universities throughout the United States (68). They also supported the first geriatric fellowships in 1976 and were later responsible for geriatric psychiatry fellowships. They developed interdisciplinary team training programs in geriatrics. They subsequently introduced geriatric evaluation and management units throughout most VAs in the United States (69). They have played a leadership role in the development of palliative care (70). Numerous teaching nursing homes were developed in the VA (71).

Table 1. Early Texts on Aging Up Until the Middle of the 20th Century

Author	Title	Date
Cicero	De Senectute	44 B.C.
Roger Bacon	The cure of age and the preservation of youth	1214–1294
Stromer	Decreta Medica de Sene	1537
Hier Brinenus	Geracologia	1585
Andreas Laurentius	A discourse on the preservation of sight, of melancholike diseases, of rheumes and of old age	1599
Anselmus	Gerocomua, suede senum regimine	1606
John Smith	The portrait of old age	1666
Luigi Cornaro	Sure and certain methods of attaining a long and healthful life	1704
Sir John Flower	Medicina gerocomica or the galeric art of preserving old men's health	1724
George Cheyne	An essay of health and long life	1725
Christoph Huffland	Macrobiotic: art of prolong life	1796
J.A. Salques	Hygiene for old people	1843
George Edward Day	Disease of advanced life	1848
Bernard Van Oven	On the decline of life	1853
J.M. Charcot	Clinical lectures on senile and chronic diseases	1874
Arnold Lorand	Old age deferred	1910
Ignatz Leo Nascher	The disease of old age and their treatment	1914
Alfred Worcester	The care of the aged, the dying, and the dead	1940
Edward J. Stieglitz	Geriatric medicine: diagnosis and management of diseases in the aging and in the aged	1943
Alex Comfort	The biology of senescence	1956
James E. Birren	Handbook of aging and the individual	1959

The first professorship in geriatrics was created at Cornell University in 1977. In 1982, the first Department of Geriatrics was created at Mount Sinai Medical School with Robert Butler as its first chairperson. In 1988, the first certifying examination in geriatric medicine was offered and, at the same time, the Accreditation Council for Graduate Medical Education accredited 62 internal medicine and 16 family practice programs to offer geriatric fellowship programs. Many of these programs were extraordinarily weak and had a dearth of faculty.

From the 1980s, two distinct schools of geriatrics developed. The east coast school consisted of the programs at Mount Sinai, Harvard, Yale, Johns Hopkins, and Duke. In 1979, John Beck began to develop the UCLA geriatrics program, ably assisted by David Solomon. This program had the advantage of being associated with two GRECCs (Wadsworth and Sepulveda). This produced the west coast school of geriatrics, which, at present, has produced the directors of geriatrics programs in Seattle (Abrass), Emory (Ouslander), Mount Sinai (Siu), Cleveland Clinic (Palmer), Saint Louis University (Morley), Rush (Gorbien), University of California, Los Angeles (Reuben), and Northwestern University (Sier). Also, Robert Kane has been closely associated with the development of geriatrics in Minnesota. The annual UCLA geriatrics meeting can claim credit for spreading geriatrics widely throughout the United States. In the Midwest, the University of Michigan geriatrics program developed under the leadership of Jeffrey Halter, the

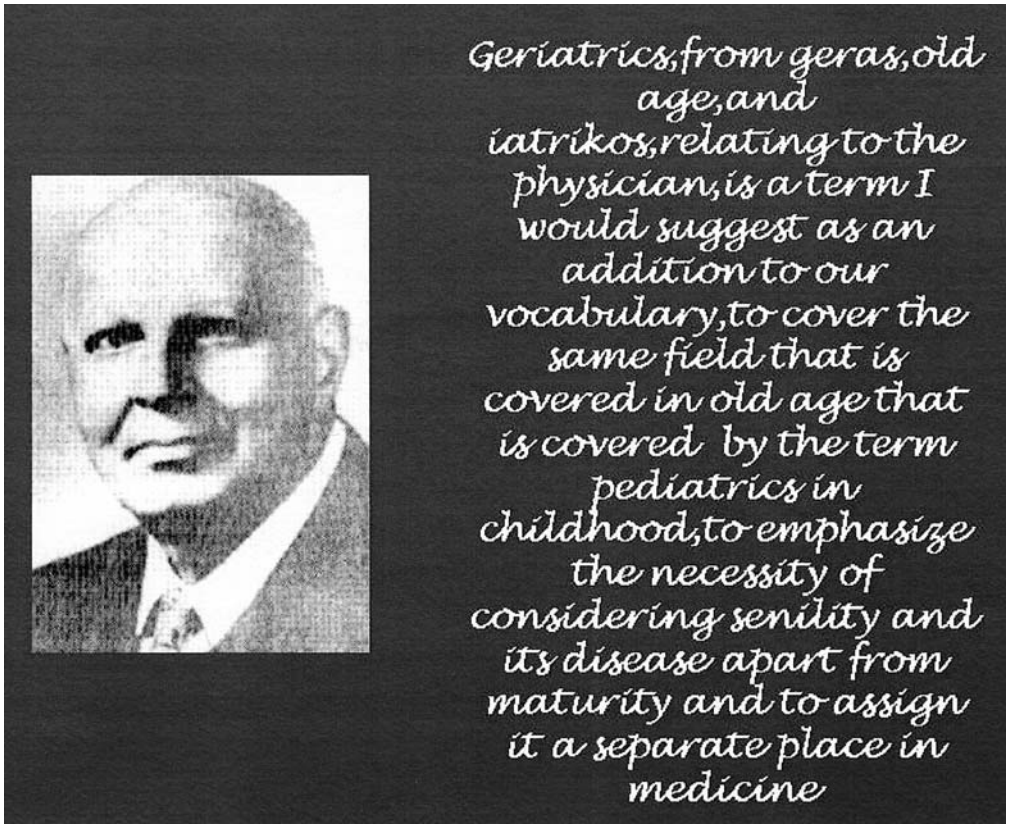

Figure 6. Ignatz Leo Nascher and his quotation arguing for the use of the term geriatrics.

program at Case Western Reserve under Jerome Kowal, and the University of Arkansas program under David Lipschitz. The Saint Louis University program was inaugurated in 1989 (72). Prior to this, it had one of the earliest GRECCs (1977) and a University-wide interdisciplinary geriatrics program under the leadership of Rodney Coe (1972). The program has played a major role in geriatric education throughout the Midwest with its geriatric conferences, scholars program, and its newsletter, *Aging Successfully*. The geriatric psychiatry division at Saint Louis University under the leadership of George Grossberg was established in 1980. The leading academic (teaching) and hospital programs in geriatrics based on the *U.S. News and World Report* rankings are listed in Table 6.

In 1995, the 2-year fellowship requirement was lowered to 1 year. This was created predominantly by the work of William Hazzard and John Burton (73). I am on record as strongly opposing this move (74), mainly because I thought then, and still do, that it takes longer than a year to train a geriatrician and that it would lower the prestige of geriatrics in internal medicine programs. Others believe that this has been a positive move (75). On the other hand, Robert Kane has argued that we have failed to develop a niche for geriatrics and geriatricians should move to nonchronic disease hospitals (76). Many disagree vehemently with this viewpoint (77–84). As of 2001, there were 122 accredited fellowship programs with 259 first year fellows and 79 second year fellows (85). Of the trainees, 55.3% were International Medical Graduates.

Second to the VA, the John A. Hartford Foundation, under the leadership of Donna I. Regenstreif, has been the major force in the development of geriatric programs (86). Their early program on midcareer faculty retraining was an inspiration that provided senior faculty early in the development of geriatrics (87). Their centers of excellence program allowed many struggling geriatric programs, including ours at Saint Louis University, to get off the ground. Their medical student summer research program has allowed many students exposure to geriatrics that will remain with them throughout their career. They also provided financial support to provide exposure to home visits for medical students. Among the many successes of this program was the development of the student-run geriatric home visit program at Saint Louis University (88). Increasing geriatric awareness in other disciplines has also been successful, particularly their program for emergency department physicians (89–93).

The Donald W. Reynolds Foundation has started to provide large grants to medical schools. In 1977, this resulted in the formation of the D. W. Reynolds Center on Aging at the University of Arkansas and, later, a department at the University of Oklahoma. The Bureau of Health Professionals, through its Geriatric Education Centers and its physician and dental fellowship programs, and, more recently, the Geriatric Academic Career Awards, has been an important leader in geriatric education.

Most direct care for older persons is provided by nurses. Nurses have been leaders in providing and developing home

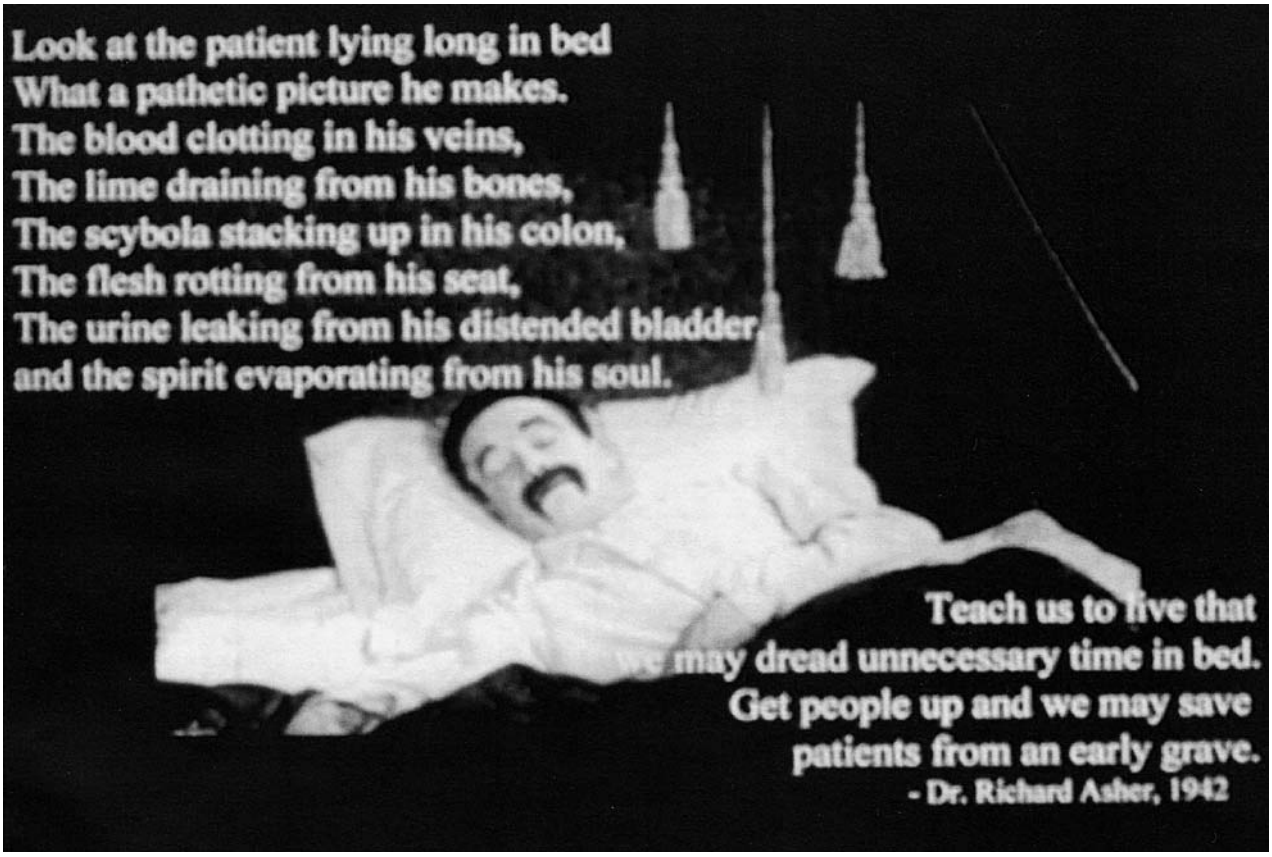

Figure 7. Poem written by Dr. Richard Asher in 1942 on the hazards of bed rest.

care services. In 1962, the American Nurses Association held a focus group on gerontological nursing that led to the formation of the gerontological nurse practice group in 1966. The first geriatric nursing standards were published in 1968. This led to the certification of gerontological nurses. Gerontological nurse practitioners have a master's degree and have become leaders in improving care in nursing homes. The research work of Evans and Stumpf has played a key role in reducing restraint use for confused older persons (94), leading to a recent call in the Journals for the abolition of physical restraints (95–97). The modern development of nursing was recently reviewed in a Future History in the Journals (98).

The History of Nursing Homes

The concept of support and comfort for the old comes from the Bible (Ruth 4:15), and shelter for the aged from the Talmud (Talmud B.B.8b). By the 11th century, these exhortations had led to the development of Jewish Homes in France and Germany to house the aged. Prior to this,

Table 2. Major Texts on Geriatrics in the Last Half of the 20th Century

Year	Title	Editors
1971	*Clinical Geriatrics*	Isadore Rossman
1973	*Textbook of Geriatric Medicine & Gerontology*	J. C. Brocklehurst
1978	*Clinical Aspects of Aging*	William Reichel
1981	*The Core of Geriatric Medicine*	Leslie S. Libow & Fredrick T. Sherman
1984	*Essentials of Clinical Geriatrics*	Robert L. Kane, Joseph G. Ouslander, & Itamar G. Abrass
1984	*Geriatric Medicine*	Christine K. Cassel & John R. Walsh
1985	*Principles of Geriatric Medicine (later and Gerontology)*	Reubin Andres, Edwin L. Bierman, & William R. Hazzard
1985	*Principles and Practice of Geriatric Medicine*	M. S. John Pathy
1985	*Practical Geriatric Medicine*	A. Norman Exton-Smith & Marc E. Weksler
1986	*The Practice of Geriatrics*	Evan Calkins, Paul J. Davis, & Amasa B. Ford
1991	*Medical Care in the Nursing Home*	Joseph G. Ouslander, Dan Osterweil, & John E. Morley
1992	*Oxford Textbook of Geriatric Medicine*	J. Grimley Evans & T. Franklin Williams
2000	*The Science of Geriatrics*	John E. Morley, H. James Armbrecht, Rodney M. Coe, & Bruno Vellas

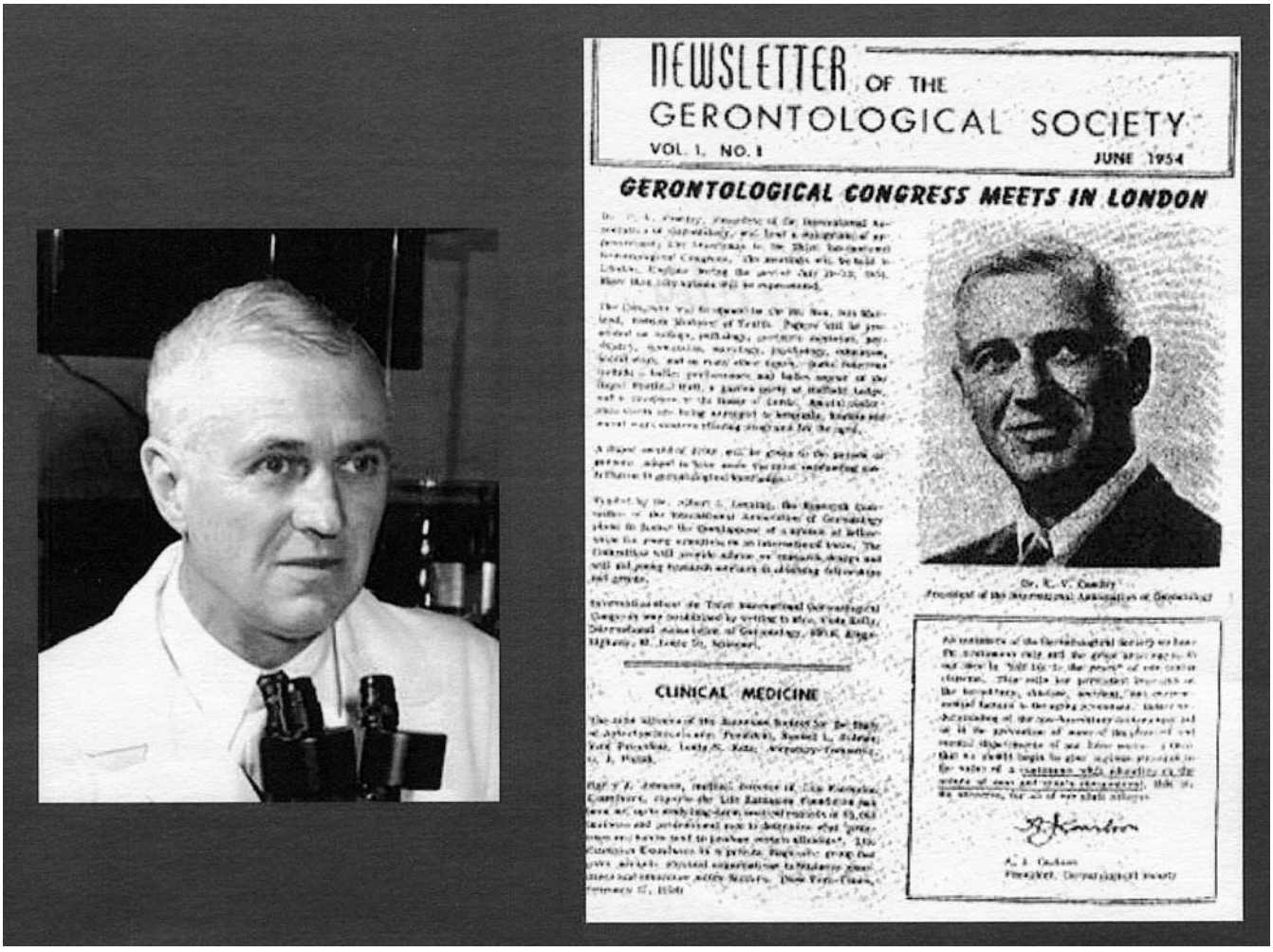

Figure 8. Vincent Cowdry and an early edition of *The Gerontologist* with his photograph in it.

during the Byzantium (324–1453 A.D.), the care of older persons was undertaken in welfare institutions known as ''gerocomeia.''

In England, the Poor Law Act of 1601 created Almshouses (workhouses). In part, this was based on Sir Frederick Eden's comment that ''A bare sustenance for the aged poor is no more than the fair right of those who have spent their best days and exhausted their strength in the service of the public. The workhouse policy was to make the old and infirm as comfortable as they can and the able-bodied, if dissolute characters, as uncomfortable as they can.'' The New Poor Law of 1834 was enacted to make life harsher for those living in workhouses so that they would prefer to be elsewhere. In 1947, the Nuffield Committee felt that the character of workhouses needed to change and that elderly persons should be accommodated in small homes to enhance their care (99).

The concept of convalescent (rehabilitation) homes was developed in France with the opening of Hotel Dieux in 1640 and the Charitie Hospital 10 years later. The first convalescent home in the United States was opened in White Plains, New York, in 1915.

The first nursing homes in the United States were charitable institutions run by Catholics or Jews. Lafon Asylum of the Holy Family opened in New Orleans in 1842, and, in 1855, the Home for Aged and Infirm Israelites opened in St. Louis, and the Sisters of the Third Order of St. Francis opened a home in Buffalo, New York. In 1853, Charless House, a charitable institution, was opened as a home for the friendless in St. Louis. While intended to look after women of all ages, the persons admitted were predominantly older widows. Other elderly people were housed in poorhouses or rural poor farms. In 1920, relatively weak state licensure programs for nursing homes were put in place. In 1950, Federal matching funds to nursing home vendors were made available, stimulating nursing home growth. With the enactment of Medicare/Medicaid in 1963, there was a doubling of nursing home beds. Quality was generally poor and, in 1971, President Nixon called for tougher regulation (100).

In 1986, the Institute of Medicine issued a report entitled ''Improving Quality of Care in Nursing Homes.'' This led in 1987 to a variety of nursing home regulations being tacked on to the Office of Budget Reconciliation Act (OBRA).

Table 3. Ode to Dr. E. V. Cowdry (Author of our Textbook of Histology)

[To the tune of the Wheaties commercial]
Have you tried Cowdry? The best Histo Book in the Land! Have you tried Cowdry? The best Histo Book in the Land!
It is thin, It is clear, It is written with force, You can use it in the bathroom When you've finished the course!
Have you tried Cowdry? The best Histo Book in the Land!
From his affectionate and thoughtful Washington University medical students in Freshman Anatomy, 1948 (Provided by John D. Davidson, MD)

These included the need for physician services, nursing aide training, restraint and psychotropic drug reduction, and guidelines on reducing polypharmacy. The guidelines on polypharmacy have generally followed those set out by Mark Beers—the so-called ''Beers' List'' (101), most recently revised in 2003 (102). In addition, OBRA '87 mandated the development of a resident assessment instrument (RAI) that is now widely utilized throughout the world. In 1997, many Californian nursing homes were considered to be substandard by the Office of the Inspector General leading President Clinton in 1999 to increase fines on, and add surprise inspections to, nursing homes. By the turn of the 20th century, lawyers had found nursing homes to be a lucrative hunting ground where taking cases on contingency and forcing settlements because they were, in general, cheaper than litigation became their *modus operandi*. While OBRA '87 resulted in some improvements in care, further legislation and legal action has become a drain on the money and time available to provide care. The RAI competed with the much simpler French version called GERONTE (Figure 10) for the hearts of legislative bureaucrats (103). Needless to say, the more complex RAI has won, despite questions of its validity as a tool that is useful for individual patient care (104).

The American Medical Directors Association (AMDA) was formed in Hilton Head in 1978 by James Pattee and Herman Gruber, with William Dodd from Georgia being elected its first president. In 1988, it moved to Washington, D.C. It has developed a certified medical director program, which requires completion of coursework but no examination or observed training. It produces the *Journal of the American Medical Directors Association* (which was, for a time, the *Annals of Long Term Care*). The latter journal is now produced under the auspices of the American Geriatrics Society. AMDA has a membership of nearly 7500, which is the largest of any of the aging societies.

Physician-Directed Home Care and Hospice

The oldest home care medical service was begun in 1875 from the Homeopathic Medical Center, which went on to become Boston University Medical Center (105). In the 1930s, the service was mainly obstetrics, by the 1950s, 70% was pediatrics, and by 1975, 62% was geriatrics. Under the leadership of Knight Steel, this service blossomed into the model for geriatric home care services by a physician.

In 1947, E. M. Bluestone and Martin Cherkasky had developed a home rehabilitation service associated with Montefiore Hospital in New York. They found that to rehabilitate patients at home cost $3 per day compared to $12 to $15 a day for hospital (106). A similar cost differential was the driving force for the short-lived development of subacute care centers in the 1990s, which were touted to be the ''primary care hospitals'' of the future for elderly persons but, unfortunately, died with the introduction of the Prospective Payment System for long-term care (107). In the 1970s, Brickner developed the Chelsea Village Program of St. Vincent's Hospital. This home care program had patients with an average age of 80 years. Half a century ago, house calls made up 40% of all physician–patient encounters while, by 1980, this had shrunk to 0.6% of all encounters (108). The 1990s has seen the development of telemedicine for homecare (109).

Marie Lou Ansak developed the OnLok model in Chinatown in San Francisco (110). The success of this

Table 4. The Joseph T. Freeman Award of the Medical Sciences Section of The Gerontological Society of America

Year	Recipient
1980	Robert N. Butler
1981	Isadore Rossman
1982	Manuel Rodstein
1983	R. Knight Steel
1984	Joseph T. Freeman
1985	T. Franklin Williams
1986	Charles M. Gaitz
1987	John W. Rowe
1988	Eric A. Pfeiffer
1989	Saul Kamen
1990	John C. Beck
1991	Evan Calkins
1992	Christine K. Cassel
1993	Reubin Andres
1994	Steven R. Gambert
1995	Richard W. Besdine
1996	Lissy Jarvik
1997	David H. Solomon
1998	Harvey Jay Cohen
1999	William Hazzard
2000	Mary Tinetti
2001	Robert J. Luchi
2002	Larry Z. Rubenstein
2003	Itamar Abrass

Table 5. The Nascher/Manning Award for Lifetime Achievement in Geriatrics Given by the American Geriatrics Society

Year	Recipient
1987	Leslie S. Libow
1989	Amasa Ford
1992	Paul Haber
1994	Leo M. Cooney, Jr.
1996	T. Franklin Williams
1998	Joanne D. Lynn
2000	Peter Boling
2002	John E. Morley

Figure 9. Leslie Libow teaching medical residents in a nursing home.

model led to the development of the capitated day-home care model known as PACE (program for All-Inclusive Care of the Elderly) (111).

Hospice, as a form of palliative care for the dying, was first developed in 1967 when St. Christopher's Hospice was founded by Cicely Saunders in London. In the United States, Hospice Inc. was founded in New Haven, Connecticut, in 1976. In North America, the first palliative care unit was opened at the Royal Victoria Hospital in Montreal, Canada, in 1977. The National Hospice Organization was established in 1977. Palliative care remains undertaught to physicians in the United States, with most hospice organizations being run by nurses and social workers. Recently, there has been a push to extend palliative care from the last 6 months of life to include all persons in the last 2 years of their life. Unfortunately, physicians are notoriously inaccurate at predicting the time to death, making this a difficult road to follow. The national Study to Understand Progress and Preferences for Outcomes and Risks of Treatments (SUPPORT) has shown major failures in our ability to provide appropriate end-of-life care (112).

Continuous Quality Improvement and Geriatrics

The concept of Continuous Quality Improvement was introduced to industry by Deming (113). As the motor industry in Detroit rejected his advice, he went to Japan and used his principles of quality control feedback and empowerment to build industry in Japan to the high standards it now displays.

In 1989, Don Berwick introduced the concept that continuous improvement was an ideal paradigm for health care (114). In the early 1990s, Schnelle began to publish articles on the use of quality control techniques for reducing restraints and managing incontinence (115–118). In 1992, Morley and Miller (119) wrote an editorial in the *Journal of the American Geriatrics Society* espousing total quality assurance as an important step in improving quality for older individuals. In 1994, Saint Louis University and the St. Louis VA GRECC held a major conference on developing Continuous Quality Improvement in Geriatrics (120). This led to the publication of ''Total Quality Management in Geriatric Care'' in 1995 (121). A recent attempt to mold critical pathways to be useful for older persons led to the development of Glidepaths for outpatient care (122). Recently, the importance of the computerized medical record and error management has again highlighted the role of continuous quality improvement in geriatrics (123–125).

The Development of Geriatric Psychiatry

As mentioned, geriatric psychiatry had its birth in 1805 with the articles written by Benjamin Rush. Sigmund Freud,

Table 6. *U.S. News & World Report* Rankings in Geriatrics for Medical Schools and Hospitals

Medical Schools	Hospitals
1. Johns Hopkins University	1. UCLA Medical Center, Los Angeles
2. University of California (LA)	2. John Hopkins Hospital, Baltimore
3. Mount Sinai School of Medicine	3. Mount Sinai Medical Center, New York
4. Duke University (NC)	4. Massachusetts General Hospital, Boston
5. University of Michigan–Ann Arbor	5. Duke University Medical Center, Durham
6. Harvard University (MA)	6. Mayo Clinic, Rochester
7. University of Washington	7. Yale-New Haven Hospital, New Haven
8. University of Arkansas Med Sci	8. University of Michigan Med Ctr., Ann Arbor
9. Yale University (CT)	9. St. Louis University Hospital, St. Louis
10. St. Louis University	10. Cleveland Clinic, Cleveland

in his forties, stated that ''with persons who are too far advanced, it (psychoanalysis) fails because owing to the accumulation of material. . .'' In 1927, Abraham disagreed with Freud and felt that psychoanalysis could still work with older persons (126).

Alois Alzheimer was born on June 14, 1864, in Markbreit Am Main in Germany (127–129). He finished his medical studies in 1888 and worked at the Municipal Mental Asylum in Frankfurt, where he collaborated with Franz Nissl on histopathological staining techniques. In 1903, he moved with Emil Kraepelin to the Max Planck Institute in Munich. He died in 1915. His first patient with the disease that was eventually to carry his name was Auguste D., a 51-year-old woman. She presented with jealousy to her husband, paranoia, memory impairment, and, toward the end of life, loud screaming. On November 3, 1906, Alzheimer presented the histopathological findings including ''several fibrils and numerous small military foci.'' In 1910, Kraepelin, in the 8th edition in his textbook of psychiatry, stated that presenile dementia should be called Alzheimer's disease. His decision to do this was most probably motivated by a desire to give credit to his institute rather than historical accuracy. Dementia had been clearly described clinically by Pinel and Esquirol. Senile plaques were first described in Paris in 1892, and then by the Prague group (Arnold Pick and Oscar Fisher).

In 1906, Gaupp pointed out that most psychiatric disorders of late life were not due to dementia (130). He provided the first clear differentiation of dementia from depression. In 1922, G. Stanley Hall, a psychologist at John's Hopkins University, published his seminal work, *Senescence: The Last Half of Life*.

Felix Port was appointed as a geriatric psychiatrist at Bethlehem Hospital in 1947 (131). He developed a ward devoted to persons older than 60 years who had psychiatric disorders. In 1955, Sir Martin Roth described the onset of late-life paranoia. David Kay linked cerebrovascular disease to depression in 1962.

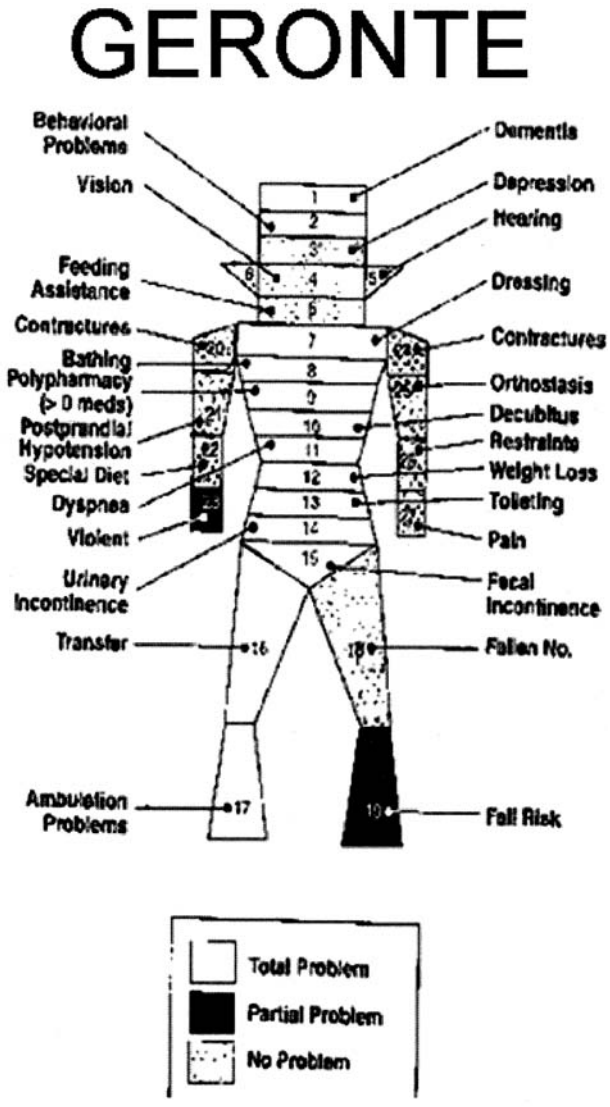

Figure 10. A version of the French nursing home assessment tool ''GERONTE'' as used by us in St. Louis.

In the United States, geriatric psychiatry developed at Duke in the 1950s. Ewald Busse led this program that produced Eric Pfeiffer, Adrian Verwoerdt, Dan Blazer, Burton Reifler, and Murray Raskind, among others. Their success was spurred by the Duke Longitudinal Studies on Aging, whose results began to be published in 1954 (132,133). Carl Eisdorfer moved from Duke to the University of Washington as chairman of the Department of Psychiatry. There he built a particularly strong geriatric psychiatry program. This program was responsible for the training of luminaries such as Murray Raskind and Burton Reifler.

The group for the Advancement of Psychiatry published the first geropsychiatry monograph, ''The Problem of the Aged Patient in the Public Psychiatric Hospital'' in 1950. In the mid-1960s, the American Psychiatric Association established the Committee (later Council) on Aging. Around the same time, the Boston Society for Gerontologic Psychiatry was established, and, in 1967, began to publish

the *Journal of Geriatric Psychiatry*. The American Association of Geriatric Psychiatry was established under the leadership of Sanford Finkel in 1978. The International Psychogeriatric Association was formed out of the Nottingham 1980 club, which had been created as part of a 2-week course on psychogeriatrics developed by Tom Arie. It publishes *International Psychogeriatrics*. The Alzheimer's Disease and Related Disorders Association is a consumer organization, formed in 1979, which has played a major role in improving care, research, and political lobbying for patients with dementia. Two books written for the public have had a major influence on increasing awareness of the needs of patients with dementia. They are *The 36-Hour Day* (Peter Rabins and Nancy Mace, 1981) and *Patient Care: A Common Sense Guide to Adult Children* (Lissy Jarvik and Gary Small, 1989). Lissy Jarvik was born in the Hague, Holland, and moved to the Brentwood VA and UCLA to develop one of the earliest psychogeriatric units.

Geriatrics in the Rest of the World

The development of geriatrics in Europe has been somewhat helter skelter with programs developing and then regressing, depending on the leadership. At the start of the 20th century, Austria was a powerhouse of the emerging field of geriatric care. It was the Austrian system that inspired Nascher to coin the term ''geriatrics.'' The Austrian geriatric school's teachings were codified by Dr. Arnold Lorund in his book, *Old Age Deferred,* which was published in 1910. He felt that the causes of aging were arteriosclerosis, problems with immunity leading to increased infections, and abnormalities of the secretions of the ductless glands. He felt that being married and having a religious belief were important components in prolonging life. He pointed out that alcohol in small doses may be regarded as a ''precious gift,'' ''an excellent stimulant for the nervous system and the circulating system.'' On the other hand, large doses of alcohol were deleterious to the whole body. Finally, he concluded that no ''faulty habit'' would ''produce so rapidly the premature appearance of old age in young women as smoking.''

In Sweden, the first chair and department of long-term care medicine was established at Uppsala University in the 1960s and the second at Goteborg University in the 1970s (134). Geriatric specialty training takes 5 years, and a voluntary examination for specialization was first offered in 1990. The longitudinal population study of persons 70 years of age was established in Gothenburg in 1970–1971 (135–137). The success of this project was largely due to Alvar Svanborg and Bertil Steen.

In the medieval period in Italy, the Catholic church established ''Ricoveri'' (old people's homes) (138). Eventually, in these homes, an area to care for infirm and disabled older persons developed, which was called the ''infermeria.'' At the beginning of the 20th century, hospital departments aimed especially to care for older and chronically disabled persons were developed. These were often considered to be ''a waiting room of death for lonely disabled patients.'' In the middle of the 20th century, these departments were upgraded with the introduction of rehabilitation units and day hospitals. ''Lungo degenza'' (long staying) hospital units and ''infermeria'' in the ''casa di reposo'' (rest homes) enhanced the level of chronic care. The Geriatric Society in Italy was founded in 1949 under the chairmanship of M. Ascoli. Most medical schools in Italy have a chair of gerontology. Two major longitudinal studies of aging in Italy are the Italian Longitudinal Study on Aging (ILSA) (involving eight centers) started on March 1, 1991 (139), and, more recently, the InCHIANTI (Invecchiare in Chianti) study (140–142).

In Geneva, psychogeriatric consultation was developed by Dr. J.-P. Junod, in 1962, who later became the first Swiss professor of geriatrics (143,144). In 1966, an ambulatory geriatric unit called CICPA (Centre d'Information et de Coodination pour les Persommes Agees) was formed. This was followed by the opening of the Hospital de Geriatric (320 beds) in 1971. In 1984, the University Geriatric Institutions of Geneva was formally instituted, and this metamorphosed into the Department of Geriatrics in 1995 under the leadership of Jean-Pierre Michel. Jean Pierre Michel also played a major role in developing the European academy for training of young geriatric faculty (EAMA) in Sion (145). EAMA has been emulated recently in the United States (Saint Louis University Geriatric Academy, SLUGA), and in Central and South America.

The Spanish Society of Geriatry and Gerontology was founded in 1948 (146). In Spain, a limited number of persons receive high-quality care from geriatric hospitals, geriatric units, inpatient geriatric consultation services, and geriatric home care teams (147). Geriatrics was recognized as a medical specialty in 1978. The training program is of 4 years' duration.

Geriatrics has not played a major role in France, although the first geriatric society was formed in 1939 under the chairmanship of A. Baudouin. The exception has been the development of geriatrics and gerontology in Toulouse (148). The University of The Third Age was developed by Professor Vellas. Subsequently, under the leadership of Professor Albarede and the younger Bruno Vellas, geriatric care focusing on nutrition and Alzheimer's disease was developed in the department of internal medicine and the gerontology clinic at CHU Purpon-Casselardit. Bruno Vellas has played a major role in increasing geriatric awareness throughout Europe.

In 1936, Copenhagen's largest nursing home, called the Old People's Town, had Torbein Gill as medical director (149). His work led to the establishment of a medical specialty in long-term care. The Danish Society of Geriatric Medicine was established in 1972. Geriatric medicine was recognized as a subspecialty of internal medicine in Denmark in 1986. General practitioners have historically carried out home visits for older persons. Denmark has been a leader in home visit research (150,151).

Japan has been slow to recognize the specialty of geriatrics, despite the fact that it has the world's longest mean life span and over 110,000 centenarians. Most older persons are accommodated in acute hospitals where the length of stay has traditionally been very long. Many hospitals have lacked adequate rehabilitation facilities. Tokuyo (special homes for the care of the elderly) are run at public expense. The Tokyo Metropolitan Institute of

Table 7. Screening Tools for Geriatric Assessment

Date	Scale	Reference
1955	Barthel Index	212,213
1963	Activities of Daily Living	214,215
1969	Instrumental Activities of Daily Living	216
1975	Mini-Mental Status Examination	217
1983	Geriatric Depression Scale	218
1984	Functional Independence Measurement (FIM)	219
1986	Get Up and Go	220
1986	Performance Orientated Assessment of Mobility	221
1994	Mini Nutritional Assessment	222
2000	Androgen Deficiency in Aging Males (ADAM)	223

Gerontology was founded in 1972 (152). This Institute focuses on interdisciplinary research on aging, with two thirds being in the biomedical area and the rest in social science and nursing. The Institute is associated with the 700-bed Tokyo Metropolitan Geriatric Hospital. In 1995, the National Institute of Longevity Science was established. Overall, aging research in Japan is relatively poorly funded with under $20 million being available in 2000 (153). The development of the senescence-accelerated mouse (SAM) models by Professor Takeda at Kyoto University has been a major contribution to aging research (154). These models have been particularly useful for exploring memory deficits (155–160). These mice are particularly good models of mitochondrial dysfunction and free radical damage (161–164). The SAMP8 mouse appears to produce its memory deficit due to an excess production of amyloid precursor protein (165–168). As can be recognized from the above references, James Flood and I have particularly benefited from Professor Takeda's generous donation of SAMP8 mice.

The First International Congress of Gerontology was held in Liege, Belgium, under the chairmanship of Professor Lucien Brull on July 10, 1950. Again, Dr. Korenchevsky had played a major role in stimulating its development. There were attendees from 14 nations. This first Congress focused on the definition of aging, the dichotomy between aging and disease, and the social aspects of aging. The second International Congress was held in St. Louis, Missouri, in 1952 under the presidency of Dr. Cowdry. There were 655 attendees from 51 countries. These included six from Argentina, who had formed their formal geriatrics society in 1945.

Geriatrics is also strongly developed in other parts of the world such as Canada, Australia, and Hong Kong. There is also an increasing need for geriatrics in the developing countries of the world (149).

Modern Advances in Geriatrics

The first major advance in modern geriatrics has been the codifying of the geriatric assessment into a number of widely used screening tools (Table 7). The first of these was developed by Dorothea Barthel, a physical therapist at Montebello State Hospital in Baltimore, in 1955. All patients undergoing rehabilitation at the hospital had the Barthel Index measured, leading to a number of publications utilizing it as the ''gold standard'' for functional evaluation. Tables 8 and 9 list the articles in the *Journal of the American Geriatrics Society* and the *Journal of Gerontology* that have been cited 200 or more times. These give a broad view of the areas that have had the most impact from the gerontological literature. It should be noted that few of the papers on Alzheimer's disease or depression have been published in these journals.

The evidence that geriatric assessment and management units are effective (169–173), and that geriatric assessment in the home also can improve outcomes (174–177), perhaps represents the major component of the success of geriatrics in the last half of the 20th century. Within hospitals, the development of units for Acute Care of the Elderly (178) and innovative approaches to the management of delirium appear to be the sentinel geriatric events (179).

From the therapeutic viewpoint, the importance of exercise therapy, especially resistance exercise, would appear to be the major impact area (180,181). The role of hormone replacement, both positive and negative, has occupied a large amount of the geriatrician's time (182,183). Somewhat biased, I believe that the understanding of the basis of the ''anorexia of aging'' has been important (184–186). Certainly the coining of the term

Table 8. Articles in the *Journal of The American Geriatrics Society* That Were Cited 200 or More Times

Citations	1st Author	Article Title	Year;Vol:Pp	Reference
1158	Pfeiffer E	A short mental status quest-organic brain deficit	1975;23:433–441	224
506	Tombaugh TN	The Mini-Mental State Examination	1992;40:922–935	225
389	Tinetti ME	Performance-oriented assess, mobility problems	1986;34:119–126	221
305	Folstein M	The meaning of cognitive impairment in elderly	1985;33:228–235	226
294	Podsiadlo D	The timed ''Up & Go'': a test-funct. mobil.	1991;39:142–148	227
278	Linn BS	Cumulative illness rating scale	1968;16:622–626	228
255	Rudman D	Growth hormone, body composition, and aging	1985;33:800–807	229
245	Shader RI	A new scale for clin assess in ger. pop: SCAG	1974;22:107–113	230
244	Whipple RH	Rel. knee/ankle weakness to falls—NH resid.	1987;35:13–20	231
219	Cohen-Mansfield J	Agitated behaviors... II. prelim. results cogn.	1986;34:722–727	232
217	Colerick EJ	Predictors institutionalization among caregivers	1986;34:493–498	233
215	Harman D	The biologic clock: the mitochondria?	1972;20:145–147	234
211	Vinson JM	Early Readmission of elderly pts w/CHF	1990;38:1290–1295	235
202	Pahor M	Long-term survival/use of antihypertensive med.	1995;43:1191–1197	236
200	Cohen-Mansfield J	Agitated behaviors in the elderly I. Review	1986;34:711–721	237
200	Morley JE	Testosterone repl. therapy—hypogonadal males	1993;41:149–152	238

Table 9. Articles in *The Journals of Gerontology* That Were Cited 200 or More Times

Citations	1st Author	Article Title	Year;Vol:Pp	Reference
1108	Harman D	Aging: theory based on free radical/radiation chem.	1956;11:298–300	12
821	Neugarten BL	The measurement of life satisfaction	1961;16:134–143	239
554	Larson R	Thirty years of research—well-being—older Amer.	1978;33:109–125	240
552	Rowe JW	Effect of age on creatinine clearance in men	1976;31:155–163	241
480	Coleman GL	Pathological changes during aging in barrier-reared Fischer 344 male rats	1977;32:258–278	242
401	Lawton MP	The Phila. Geriatr Center Morale Scale-Revision	1975;30:85–89	243
354	Lawton MP	Research/service oriented multilevel assess. instru.	1982;37:91–99	244
307	Poulshock SW	Families caring for elder sin residence. . .burden	1984;39:230–239	245
292	Novak LP	Aging, total body potassium/fat-free mass/cell mass	1972;27:438–443	246
272	Harman D	Free rad. theory-aging..mortal. rate-male LAF mice	1968;23:476-482	247
235	LaRue A	Health in old age: physician ratings/self-ratings	1979;34:687–691	248
229	Campbell AJ	Risk factors for falls—community-based study	1989;44:M112–M117	249
229	Robinson BC	Validation of a caregiver strain index	1983;38:344–348	250
222	Deimling GT	Mental impair. among elderly-effects-caregivers	1986;41:778–784	251
212	Borkan GA	Assess boil. age using profile of phys. parameters	1980;35:177–184	252
210	Maeda H	Nutr influences on aging-Fishcer 344 rats: pathol.	1985;40:671–688	253
210	McGandy RB	Nutrient intakes/energy expenditure in men	1966;21:581–587	254
208	Murray MP	Walking patterns in healthy old men	1969;24:169–178	255
207	Edwards JN	Correlates of life satisfaction: a re-examination	1973;28:499–502	256
202	Helderman JH	Response of arginine vasopressin to intravenous ethanol and hypertonic saline—man: impact—aging	1978;33:39–47	257
200	Lemon BW	Activity theory of aging: types & life satisfaction	1972;27:511–523	258

''sarcopenia,'' the understanding of its pathophysiology, and the emergence of the obese-sarcopenic (''fat-frail'') syndrome represent another key area of geriatric endeavor (187–190).

Of the seminal theoretical underpinnings of modern geriatrics, I believe we should identify Fries' theory of compression of morbidity (191–193), Rowe and Kahn's successful aging hypothesis (194), and the controversial emergence of frailty as a syndrome (195–198).

Finally, the enormous advances of medicine in general in the treatment of diseases from cardiovascular diseases (199–201) to neuropsychiatry conditions (202–204) has had a tremendous impact on the care of the older person. In this century, we will hopefully obtain the evidence-based medicine necessary to allow us to make appropriate treatment choices for 70, 80, and even 90 year olds. The increasing studies on the factors (genetic and environmental) that allow centenarians to age successfully will certainly be one of the major scientific successes in the next 50 years (205–211).

Conclusion

It is hoped that this brief review of the history of geriatrics, together with the commentaries that follow, will provide a foundation for geriatricians of the 21st century to view their origins. Like all histories, this one is somewhat epochcentric, focusing on the last 50 years. However, in the case of geriatrics, this is less of a problem, as the flourishing of geriatrics has been a relatively recent phenomenon. For those wishing more detail of more distant history, I recommend *Roots of Modern Gerontology and Geriatrics: Fredric D. Zeman's ''Medical History of Old Age and Selected Studies by Other Writers,''* edited by Gerald J. Gruman (New York: Arno Press, 1979). This history focuses on the physician history, and geriatrics is clearly *par excellence* an interdisciplinary endeavor. As such, there is a need for a future history that provides a less physician-centered viewpoint. Finally, this history is somewhat geocentric, focusing on the Anglo-American development of geriatrics and, to some extent, a Californian-Midwestern perspective. It is hoped that the commentaries will help to offset some of these shortcomings.

Acknowledgments

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