intense inspection of issues requiring specialized attention. The special committee had only fact-finding and reporting responsibilities; it could not receive bills and report them for Senate action. In addition, the Committee was to submit its final report a year later and "cease to exist." In short order, however, the committee issued a number of reports and took other actions causing its members and other senators to see the advantage of continuing the committee. It was extended regularly on a year-to-year basis until 1977, when it was made a permanent unit.

A prominent committee function is to issue reports after hearings or other research. An annual committee report, summarizing policy actions and exploring emerging or continuing issues, has been described as "a major policy document" and a "remarkable storehouse" of information (Rich & Baum, 1984). Individual Committee members—many of them prominent in authorizing, appropriations, or budget committees—often sponsor bills recommended or suggested by Committee on Aging studies. Thus, the committee often serves as a catalyst for legislative action. The committee also provides authoritative statistical information useful to the Congress, specialists, and the general public. For example, in 1985, it issued *Aging America: Trends and Projections. 1985-86 Edition,* in cooperation with the American Association of Retired Persons, the Federal Council on the Aging and the Administration on Aging.

The House Select Committee on Aging, established in 1974 after years of effort by individual House members to establish a counterpart to the Senate aging unit, performs similar functions. Following the Senate pattern, the House committee has no legislative jurisdiction and cannot report out bills. Its investigative and other oversight functions are often performed through hearings, in Washington DC and in the field, through studies by staff or guest experts, and regular communication with federal agencies and informed individuals throughout the field. It "endeavors to be a one-stop information source not only for members of the House but also for private individuals" (Rich & Baum, 1984). It has persistently paid intensive attention to long-term care issues, including development of readily accessible home care services. In 1985, a series of reports drew attention to the

In summary, the Congress continued a pattern of fragmentation in legislative authority on matters related to aging. The House and Senate Committees on Aging promote communication, and where possible, coordination. They also act as advocates to assure that public programs serving all age groups give adequate attention to the needs of older Americans. The steady rise in the numbers of old and very old Americans makes it likely that this pattern will continue, steadily striking a balance between specialization in aging and the relationship of aging concerns to total governmental concerns.

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See also

GOVERNMENT PROGRAMS: FEDERAL
HEALTH CARE POLICY
OLDER AMERICANS ACT
POLICY ANALYSIS
SOCIAL SECURITY
WHITE HOUSE CONFERENCES

CONNECTIVE TISSUES

With increasing biologic age, animal connective tissues undergo a variety of changes. For example, skin becomes thin, rigid, and less elastic. In blood vessels, the walls thicken and the lumen widens (Hall, 1976). In rats, tendon obtained from the tail loses elasticity and tensile strength (Vogel, 1978). Although biochemical events leading to such changes are not completely understood, studies of age-related changes in collagen and elastic fibres have furnished some clues.

Collagen

Collagen is the major structural protein of the body. It is not a single molecule, but consists of at least five types, each present in different tissues in different amounts (see table). The basic collagen molecule is long and narrow, measuring 3,000 Å by 15 Å, with an approximate molecular weight of 285,000 daltons. Each molecule consists of three chains, known as alpha chains, which are held together by hydrogen bonds and wound together like the strands of a rope. Except for short segments at each end

of the alpha chain, every third amino acid is glycine. Collagen is synthesized in precursor form called procollagen, which undergoes further modifications that result in formation of stabilizing crosslinks between individual chains (Pinnell & Murad, 1983).

Aging collagen undergoes a variety of structural alterations. Collagen fibrils from skin, tendon, cornea, sclera, and meninges thicken with age. Wide-angle x-ray diffraction studies of chorda tendinae and Achilles tendon have shown age-related increase in degree of order within the collagen fibril (Gross, 1961). Changes in various physical properties also occur with aging collagen. For example, old tendon fibers show enhanced thermal shrinkage, being able to contract with greater strength upon being heated (Gross, 1961). Collagen from lung (Kohn, 1959), tendon (Kohn & Rollerson, 1958), and myocardium (Kohn & Rollerson, 1959) show an age-dependent decrease in osmotic swelling. In addition, aging collagen becomes stiffer, less soluble in salt solution, more difficult to extract with acetic acid, and more resistant to proteolytic attack by bacterial collagenase (Balazs, 1977).

The resistance of aging collagen to external influences is believed to be a result of formation of crosslinks between collagen molecules. In a hypothesis proposed by Cerami (1985), these crosslinks result from interaction between glucose and proteins. In a series of reversible, nonenzymatic reactions, the amino group of a protein interacts with the aldehyde function of glucose, forming a Schiff base that undergoes Amadori rearrangement. The Amadori product then undergoes further irreversible rearrangements to result in crosslinking of the involved proteins. One example of such an advanced glycosylation endproduct is 2-furoyl-4(5)-(2-furanyl)-1H-imidazole, a condensation product of two glucose molecules and two lysine-derived amino groups (Cerami, 1985). Such protein crosslinks are believed to confer rigidity and stability to aging collagen.

Formation of crosslinks may also explain the fluorescent properties of aging collagen. Collagen obtained from human Achilles tendon shows an age-dependent increase in a substance that fluoresces at 406 nm (Labella & Paul, 1965). This is believed to result from progressive crosslinking of peptide chains (Balazs, 1977).

Elastic Fibers

In contrast to collagen, elastic fibers make up only a small proportion of human skin (0.6% of dry weight). They are abundant in ligamentum nuchae, aorta, lung, Achilles tendon, and cardiovascular system. Electron microscopy has shown that elastic fibers consist of an amorphous component called elastin, which is surrounded by microfibrillar protein. Elastin consists of linear polypeptides with a molecular weight of approximately 72,000 daltons. Its content is high in alanine and valine, but it is devoid of hydroxylysine, tryptophan, histidine, and methionine. As in collagen, glycine accounts for one-third of the amino acids, but is unevenly distributed along the polypeptide chain. A unique feature is the presence of desmosine, a compound formed by covalent linkage of four lysine residues and which serves to connect individual elastin polypeptides. Microfibrillar proteins are thin fibers that surround elastin. Their contents are high in cystine, methionine, and histidine, but low in alanine, glycine, and valine (Ryhanen & Uitto, 1983).

Although less is known about aging of elastic tissues than about aging of collagen, a variety of age-related changes are well recognized. In the skin, wrinkling and laxity with advancing age are believed to result from loss of the vertical, subepidermal fine skeins of elastic fibers (Kligman, et al., 1985). In contrast, elastic material located deeper in the dermis shows the opposite change. Here, elastic fibres become thicker, more numerous, and more branched and disarrayed (Kligman, Grove, & Balin, 1985). In sun-damaged skin, there is massive accumulation in the dermis of an amorphous material that takes up elastic stains. Although previously thought to result from degenerating collagen, this substance has been shown by electron microscopic studies to represent degenerating elastic fibers (Lavker, 1979). Although it has been shown that concentration of desmosine in sun-exposed skin is four times that of sun-protected skin, this increase is felt to be insufficient to account for the massive deposition of elastotic material in the dermis (Kornberg, Matsouka, & Uitto, 1985).

The composition of elastic fibers changes with age. During embryologic development, newly developed fibers contain microfibrillar protein almost exclusively. With increasing age, an amorphous component (elastin) appears (Ryhanen & Uitto, 1983). The mature elastic fiber consists mainly of elastin surrounded by microfibrillar protein (Ryhanen & Uitto, 1983). Like collagen, elastin exhibits increasing fluores-

cence with age. In addition, elastin becomes increasingly calcified and becomes yellow (Balazs, 1977). It is possible that like collagen, elastin also undergoes progressive crosslinking with age (Kohn, 1977).

Ground Substance

Although ground substance makes up less than 0.2% of dermal dry weight, it may be important in determining rheologic properties of the skin. Because of its extraordinary capacity to hold water, hyaluronic acid is thought to be responsible for the normal turgor of the dermis (Kligman, Grove, & Balin, 1985). In addition, the ground substance provides a pathway for diffusion of nutrients through the interstices of the dermis, and probably functions as a lubricant by allowing collagen fibers to slide past each other (Kligman, Grove, & Balin, 1985).

Between newborn and infancy, a significant reduction in soluble fraction of dermal glycosaminoglycan (GAG) has been noted. Dermal GAG level remains stable through middle age and drops further during old age (Fleischmajer, Perlish, & Bashey, 1972), probably as a result of decreased synthesis (Fleischmajer, Perlish, & Bashey, 1973). It has also been suggested that age-related changes of collagen may result from the interaction of GAG and collagen (Heikkinen, 1973; Jackson & Bentley, 1968).

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See also
BIOLOGICAL THEORIES OF AGING

CONTINUITY THEORY

Continuity of personality has two meanings. One refers to the life course itself, defining continuity as small, imperceptible changes over the whole course of life, in contrast to sudden changes from one stage to another; the other refers to the maintenance of some unity of the person throughout life, even if this course itself is subject to abrupt changes. Using the first meaning, continuity or discontinuity can apply to a whole population in the course of life; here many abrupt changes can be considered to be gradual, if a sufficiently fine measurement is employed (e.g., gradual retirement, gradual leaving of home by the children). Stages then become a more convenient categorization, although at some times complete reorganization may take place. Individual continuity, however, can be maintained over quite abrupt changes or can be lost in gradual changes; determination of this kind of continuity is an ancient and yet still relevant problem. Both definitions consider the underlying identity of the self throughout life as the essential concept for the student of the life course. This identity underlies the (possibly normal) abrupt changes in life as well as the changes in the more superficial measures over time, which must be interpreted in relation to the essential self. The problems raised by the two meanings of continuity theory can be treated together.

Permanence of the self has been an ancient problem of philosophy; its manifestations reach to personality measurement and the prediction of adjustment in aging. In all developing organisms some change, as a function of intrinsic and extrinsic conditions, can be expected as well as some constancy, as long as we talk about the same organism. Neither continuity nor its opposite can be taken as an absolute statement. Consistency will be determined by the kind of measurement, the topics to be covered, and the conceptual basis on which this development is to be considered.

Correlational analysis of personality traits over an extended period of time can compare the relative positions of individuals in a population on one or another trait. If the range of possible values is considerable to begin with, stability (high correlation) will be shown even with considerable absolute changes. Studies of this kind have led to claims of continuity (Thomas, 1980). Qualitative studies, however, examine changes purely on the basis of individuals. If there are changes in the situation, measures of the same variables have different meanings for the individual and show changes. Here interpretive techniques have to be used to reflect the different ways in which the same basic trait can be expressed. Maris (1978) has contrasted young persons who try to adjust the world to their own needs with older persons who have to find new ways to maintain themselves in the face of relatively more powerful surroundings. Actions in both cases may be quite different but reflect continuity in maintaining the valuable part of the self.

The differential variability in different measures showing continuity cannot be discussed in