

GERONTOLOGY

Live Longer and Happier

Research is leading to control of heart disease, arthritis and the rheumatic ailments—even cancer—so that longer life may mean happier life, Faye Marley reports.

► BEHIND the noisy political furor over medical care of the aged, hundreds of quiet research programs are pointing the way to more comfortable and enjoyable old age.

Many of the more than 17 million persons 65 years and older can look forward to healthy, alert years provided they follow their doctors' advice concerning diet, treatment of chronic conditions and mental outlook.

Nutritional Needs

The basic nutritional needs of the elderly are not much different from those of other adults, Dr. Fredrick J. Stare of the Harvard School of Public Health advises. A variety of such foods as fruits, vegetables, meats, fish, dairy products and cereals will provide the necessary nutrients without the addition of expensive food fads. Dr. Stare praises the enrichment of basic foods, such as bread, milk, rice and breakfast foods, which assures both old and young of good nutrition by way of the ordinary grocery.

Fluoridation of water also is important to those of advancing years, the nutritionist points out, not only because of its lasting effect on tooth enamel, but in the possible prevention of osteoporosis, a common bone disorder of the elderly.

Problems of nutrition among old people are rarely caused by difficulties of absorbing food into the body but are more commonly caused by a lack of interest in eating, which results in poor dietary habits. Poor dentures and lack of money to buy proper food also cause problems.

Health racketeers preying on elderly arthritis sufferers at a cost of some quarter billion dollars a year were the subject of hearings on frauds affecting older people early in the 1963 congressional year.

There is no scientific evidence that specific items in the diet of the average arthritis patient will either cure or benefit his condition, yet food supplements along with numerous other "quack" treatments attract victims who are willing to pay any amount to get relief.

Reduction and control of the chronic diseases that plague the aging are progressing through research. The National Institutes of Health, Bethesda, Md., today is providing more than \$20 million for over 850 projects in aging in medical schools, hospitals and other research institutions in this country and abroad.

The Government's center for aging research at the National Institutes of Health is attempting to increase the healthful enjoy-

ment of the longer life that is now being lived in America. Dr. Eugene Byrd, acting director of the center, told SCIENCE SERVICE that progress is being made in all phases of aging, but the aim is not primarily to increase the human life-span into years that might be fraught with senility.

Exploration of the possibilities of the extension of human life up to 140 years has not shown that such years would be vigorous and enjoyable, but quite the contrary.

Many old people are not interested in living beyond 100, or even beyond 70 or 80. Research scientists viewing the problems dispassionately are inclined to agree with them.

What causes aging is a matter of debate and controversy. Modern research cannot accept the simple concept that loss of cells in non-dividing tissue is the only answer. Much biological research is investigating the cellular changes that cause cellular death.

Dr. Nathan W. Shock of the National Health Institute's gerontology branch, Baltimore City Hospitals, implicates the breakdown of nerves and glands as well as other factors.

Theories on Aging

One theory is that the slowing down of enzyme activity is directly or indirectly related to the aging of bones. Preliminary findings of Dr. E. A. Tonna at the Hospital for Special Surgery, New York, indicated that there is a drastic reduction in the activity of the enzymes after sexual maturity. This may affect the periosteum (fibrous membrane covering) surrounding the bone and cause aging.

Collagen, the most abundant protein in the body, has been reported to age steadily from one month before birth until the age of about 60. Dr. Seymour Bakerman of the University of Kansas Medical Center said this change follows an orderly process that can be described mathematically.

Many possible approaches to discovering the cause of aging and its arresting and possible reversal have been suggested.

One of these is advanced by Dr. Johan Bjorksten of Madison, Wis., a chemist who has established his own research foundation. He is enthusiastic about controlling aging, rating the chances better than the outlook for abolishing cancer.

His theory of aging, not widely accepted, is that it is due to cross-linkage of molecules. If cross-linkage of protein and nucleic acid molecules initiates the aging processes, Dr. Bjorksten reasons, it should be possible to control and, within limits, reverse aging. This would be accomplished by a therapy that would break down the cross-linked groups and thereby free the space they occupied for synthesis of new normal molecules.

Cross-linkage, Dr. Bjorksten says, is like what would happen in a large factory with
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Live Longer and Happier

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thousands of workers, if someone slipped a pair of handcuffs on one hand of each of two workers to tie them together. Since such tying up of large molecules into pairs and even larger groups or aggregates occurs in every cell, it explains the fact that no human tissue is free completely from the effects of aging.

Some soil bacteria, the chemist believes, must be able to break down the cross-linked aggregates. Otherwise, the earth would be covered with fossil proteins that now occur only as rarities.

The importance of this unproved cross-linkage theory lies in the mechanism of the science of aging itself, the cause of progressive resistance loss, which, more than any single disease, results in death.

Research on the nature of the genetic material deoxyribonucleic acid, or DNA, is another approach to understanding the science of aging.

The inherited characteristics at birth and the genetic changes that occur during a lifetime are believed to be determined by DNA, which may also be capable of determining a person's rate of decline and aging characteristics.

NIH Research

The gerontology branch of the National Heart Institute includes researchers trained in zoology, biochemistry, embryology, physiology, biophysics, medicine, nutrition and psychology. With qualified technicians, this staff investigates all aspects of the science of aging, beginning with basic biologic processes and continuing through the effects of aging on the total performance capacity of the individual.

A current study of about 400 men between the ages of 24 and 99 years shows no evidence for sudden breakdowns in performance capacity at a certain age. Age changes accumulate slowly over the entire life-span. Disability is not necessarily associated with aging. Although the amount of blood pumped by the heart grows less, it is adequate for normal purposes.

If older persons have the necessary elements in their diets they can form new tissue and replace calcium in their bones. Reduction in muscular strength is partly due to disuse. Muscles that are exercised daily show little change with age.

The slowing of mental processes and behavior in the aging can now be measured by an apparatus called the psychomet, designed and constructed at the National Institute of Mental Health, Bethesda, Md.

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the psychomet in aging studies on 160 civil air pilots and air traffic controllers, with surprising findings on the appearance of aging trends in relatively young and healthy men. But the older individuals show general slowing of psychomotor performance.

As the tested persons press keys in response to various simple and complex stimuli shown on a panel of ten lights, the psychomet scientifically measures the speed of reaction in a broad range of tasks.

Prediction of length of life and physical disease may be possible as a result of further studies.

The nerves of the aging degenerate to a certain extent, but as a whole they appear to remain intact if there is no actual disease affecting them.

There are approximately 20 million nerve cells in the brain, and changes do take place in a number of them, but the brain does not appear to undergo any atrophy. Some cases of a beautifully preserved brain have been found at a very advanced old age.

Emotional disturbance and minor mental illness in the elderly need not progress to the status of treatment in a mental hospital. The family physician soon differentiates between the patients who need treatment for physical ailments and those chronic complainers who need an interest outside themselves.

Regardless of retirement at 65, the aging person who has accepted work and work substitutes in the form of constructive activity has a scientific basis for normal living.

• Science News Letter, 83:55 January 26, 1963

PUBLIC SAFETY

Home Accident Check List Shows Danger for Aged

► ACCIDENTS occur at home, and now a check list has been issued that itemizes 69 danger points exclusive of the family car. Thirty-one of them are aimed directly at those over 65 years of age.

Beginning with the general household, attention is directed to causes of accidents, some of which killed 13,600 older persons last year.

Here are a few of the important directions for safety in kitchen and laundry, basement, bathroom, yard and porch:

Hang clotheslines above head height.

Install along each stairway strong bannisters or railings high enough to prevent a person from toppling over them.

Provide good and continual lighting.

See that corners on cabinets are rounded or protected.

Wipe up spilled grease immediately.

See that aprons are plain—no loose ties, fancy pockets or trailing sashes.

Use wheeled carts for transporting dishes, laundry and trash.

Use short or close-fitting sleeves when cooking.

Avoid heavy lifting.

Use non-slip rubber mats in the bath tub and shower.

Keep hazardous tools and firearms locked.

Copies may be ordered from the National Society for Crippled Children and Adults, 2023 Ogden Avenue, Chicago 12, Ill.

• Science News Letter, 83:62 January 26, 1963