

Survival Past the Century Mark

By NATHANIEL WEYL

Man's quest for longevity antedates both Genesis and Greek mythology. It has roots as universal as man's consciousness of the inevitability of his own death.

From the Greek heroes to the Hebrew patriarchs, the dream of longevity has involved prolongation of physical, sexual and mental vigor—an intensification of the quality of life rather than the mere prolongation of senility and pain.

Death is an essential part of the evolutionary process. Given the fact that the biosphere cannot accommodate an infinite number of human beings, the old must die if the newly born are to find ecological niches in which they can survive. If death ever took a holiday, birth would also have to go on furlough. Victory over death would mean suspension of the evolutionary development of the human species; prolongation of the lifespan would involve retarding man's evolutionary adaptation to his habitat.

OUTSTANDING SURVIVORS AND ACHIEVERS

In his challenging book, *Age and Achievement*, Professor Harvey C. Lehman found that most great scientific discoveries are made before age 35. The more intellectually demanding the field, the lower the age of peak creativity. The decline of mental power with age is most rapid and most decisive among those poorly endowed. Highly intelligent people tend to retain a large part of their mental ability into advanced old age.

Alexander von Humboldt (1769-1859) published the first two volumes of *Kosmos*, a work designed to epitomize and co-ordinate all the scientific knowledge of his time, when he was 76 to 78. The third and fourth volumes appeared when Humboldt was 81 and 89.

Dr Charles Greeley Abbott, secretary of the Smithsonian Institution and a world authority on the astronomy of the sun, designed one of the first solar energy power systems at 64 and was a pioneer advocate of the use of solar energy to desalinate the earth's deserts and thus increase world food supply. He was still working part-time on 31st May 1972 when his hundredth birthday was celebrated.

Liberty Hyde Bailey's *Standard Cyclopaedia of Horticulture*, published by Macmillan in 1900, brought him fame as perhaps the first American to treat that subject as an applied science. At a Sunday morning cocktail party in Georgetown, British Guiana, in 1948, Dr Bailey, who was then 90, complained to the writer that he was no longer able to cut his way through the bush with

his machete, but had to hire a Negro for that purpose and ride behind him on a donkey. When he finished his work on the palm trees of the world, he added, he would retire and give younger men a chance. When Dr Bailey died at 96, he had published 63 books, edited four encyclopaedic works in his field, headed a government commission, written two volumes of poetry, and published articles on formal philosophy.

Another great survivor was Titian, who was supposedly at work on a canvas in his Venice studio when the plague carried him off at 86. Benjamin Franklin swam every day until 80, dying at 84. Inaugurated President at 57, John Quincy Adams sometimes began his official day by stripping to the buff and swimming the Potomac from the White House Lawn. Peyton Rous received the Nobel Prize in 1956 at age 87 for his classic earlier experiments which showed that some animal cancers are virus-linked.

When one considers that grandmaster chess is a young man's game because it probably involves more intense and sustained brain work than any other human activity, the case of Wilhelm Steinitz is remarkable. An Austrian Jewish genius who struggled all his life against destitution and died in a poor house, Steinitz held the world chess championship for 27 years. When he lost it, part of his mind cracked. He carried on conversations on an invisible telephone and believed that he was playing chess with God, giving the Deity pawn-and-move handicap. Confined to the Morossow sanitarium in Moscow, he wrote a friend: "Like all lunatics, I imagine the doctors are crazier than I am." The remarkable thing about Steinitz is that, when released from the sanitarium, he went back to tournament chess and defeated Emmanuel Lasker, the world champion.

In athletics, extreme longevity is rarer. Here the aged are generally, but not always, confined to contests requiring neither speed nor strength. Thus, C. Arthur Thompson may be the only golfer to have shot a score lower than his age. He shot 96 at age 97.

In 1955, Jerry Ameling (83) and Joseph Lehnbeutter (82) competed in an American Bowling Congress tournament. The oldest Olympic medalist was Oscar G. Swahn of Sweden who took a silver medal in 1920 at age 73 for shooting running deer. Pierre Etchbaster's achievement required more vigor. For 27 years he was undefeated world amateur tennis champion, retiring in 1955 at age 60. Then there was 55-year-old William E. Barnie who swam the 21-mile wide English Channel in 1964.

Kings, clergymen and politicians chalk up more impressive records for longevity in office than athletes and intellectuals. Senility appears to be a less insurmountable barrier to the performance of their duties.

Pepi II, an Egyptian Pharaoh, ascended the throne at age six in B.C. 2272 and held down the job for 91 years. Both Christian Hornsrud, a Prime Minister of Norway, and Josef Madarasz, who held the same office in Hungary, lived to see their 101st birthdays. El Hadji Mohammed el Mokri, a Grand Vizier of Morocco, died in 1957 at the alleged age of 112. And in Clinton County, Missouri, Albert R. Alexander retired from his duties as magistrate in 1965 at the age of 105 years eight months.

The princes of the Roman Catholic Church are outstandingly good at surviving according to the data in that invaluable compendium the *Guinness Book of World Records*. Elevated in 678 A.D. at the reputed age of 103, Pope St Agatho served for three years. A more solidly evidenced case is that of Leo XIII, named Pope in 1878 and deceased 25 years later at age 93. In 1972, the College of Cardinals had a 92-year-old member, Cardinal Bishop Paolo Giobbe. Bishop Alfonso Carinci held office until his death in 1963 at age 101. Herbert Welch, Bishop for Japan and Korea of the United Methodist Church, died at age 106 in 1969.

What this shows is not that "you are only as old as you think," but merely that a few individuals are able to perform competently at physical, mental or bureaucratic tasks well beyond the normal age of retirement. Observed variations in the relationship of chronological age to senility and loss of physical and mental powers seem no greater than the range of variation between one person and the next in such other measurements as height, strength, dexterity, musical perception, intelligence and sexual vitality. Establishing the fact that some people have been productive at ages when most of their contemporaries were invalids or dead does not prove that everyone can follow their example. We do not know the extent to which differences in capacity for survival are genetically determined. Even if we should find that environmental forces are primary, it would not necessarily follow that the average adult can retain physical, sexual and mental vigor by transplanting himself to a more favorable environment nor would doing so guarantee adding to his lifespan.

THE DUKE UNIVERSITY STUDY

After an in-depth study of the aging process in a North Carolina sample of 502 healthy subjects aged 46 to 70, the Duke University Center for the Study of Aging and Human Development concluded that heredity sets the limits of lifespan, but that 38 environmental variables determine the extent to which these limits will be approximated.

Key elements in vigor and survival were work satisfaction, a positive and optimistic approach to life, general health, and regular exercise. Retirement and cessation of physical activity tended to hasten death as did the psychic stress of being moved into a new environment.

Intact marriages and "high intelligence" were two characteristics of long-term survivors. On the Wechler Adult Intelligence Scale (W.A.I.S.), long-lived women had average I.Q.s 31 points higher than those with short lifespans. For men, the spread was 25 I.Q. points in the same direction.

Those who lived longer had on average four more years of schooling. Class differences worked in the same direction. Manual workers constituted 60 per cent of those who died early, only 30 per cent of those who died late. Among women, manual workers were 24 per cent of those with long lifespans, 71 per cent of those with short lifespans.

Those who stayed married lived significantly longer than the divorced, separated, widows and widowers. Sexual activity tapered off with increasing age. At 56-60, 51 per cent of the men had intercourse at least once a week; at 61-65 only 37 per cent and at 66-71 a mere 28 per cent. Reflecting the preponderance of widows over widowers, sexual activity among the women studied was even more infrequent.

Physicians and gerontologists stress that sexual activity among old people is normal and that its repression can be physically traumatic. On the other hand, there is no convincing evidence that members of the Catholic clergy had shorter lifespans than their noncelibate Protestant counterparts.

THE SEARCH FOR CENTENARIANS

Aging, a U.S. Government periodical, reported in 1971 that there were 5253 centenarians on Social Security, an increase of 2053 in two years which was probably attributable to better reporting. New York State led the nation with 542, followed by California with 498, Pennsylvania with 388, Illinois with 286 and Michigan with 196. Florida had 148. The geographical distribution may reflect past, more than present, population since the very old are not mobile. The editors concluded that there may be as many as 15,000 centenarians in the nation.

On the other hand, Robert J. Myers, Chief Actuary of the Social Security Administration, analyzed the available records on 10,000 self-styled centenarians and concluded that only 3,700 were genuine. An analysis of the 1901 and 1911 censuses for England and Wales indicated that the very old tend to advance their age from 15 to 17 years every decade.

The most reliable available documentation on Americans born more than a century ago is the records of the Union Army in the Civil War. They show that by 1945 only 210 of the approximately 2.1 million men who served were still drawing pensions. These survivors were probably between 15 and 20 at the close of hostility in 1865, the lower age applying to drummer boys. The indicated ratio checks with the estimate of 15,000 centenarians in the present U.S. population.

The last Union Army veteran died at age 110. His Confederate counterpart, John B. Salling, died in 1959 a day after celebrating his 115th birthday. If the Southerner lived longer, the reason may be that Confederate records are less accurate.

There are not only great survivors, but great prevaricators and an inbetween group of unknown veracity. On 13th October 1972, *Life* magazine published an article by former slave, gambler, bootlegger, and outlaw, Charlie Smith of Bartow, Florida, who claimed to have just celebrated his 130th birthday. In a more sceptical treatment of the same subject five years earlier, *Time* noted the big gaps in Charlie's story of having been lured on to a slave ship in Liberia and put on a New Orleans auction block in 1855: "None of the evidence specifically mentions him or proves he was born when and where he says he was." Charlie Smith's recipe for passing the century mark was to eat raw sausages and crackers and drink 7-Up. "I never drank green (raw) milk—only chocolate," he told reporters.

The *Guinness Book of World Records* observes that there is a positive correlation of 0.83 between "the claimed density of centenarians in a country and regional illiteracy." This can be interpreted as evidence that the very old lie unconscionably about their age or alternately as signifying that civilization brings death-hastening ecological damage together with literacy.

Preposterous claims to longevity are as old as man's ability to use language to conceal the truth. One of the best known cases is that of Christian Jakobsen Drackenberg, a seventeenth century Norwegian who allegedly lived 145 years and 326 days. The "oldest man on earth," according to a 1933 Peking news dispatch, was Li Chung-yun who was supposedly born in 1680 and lived for 256 years. The author of this dispatch should have delayed filing it until 1936!

On the basis of careful study of the birth and death statistics of the very few countries which have accurate records stretching back a century in time, actuaries have concluded that there seem to be formidable barriers to extending human life beyond 115 under the conditions prevailing in civilized countries in the nineteenth and twentieth centuries. Sweden is the only nation which has systematically investigated the longevity claims of all of her

very old citizens. Not one has been found who lived beyond 110. The accurate records of the British peerage disclose only one who passed the century mark. Actuaries have placed the chance at living to 115 as about one in two billion. If so, two such people should exist today and fewer than half a dozen in the entire history of *Homo sapiens*.

ABKHASIANS AND HUNZAKUTS

If there is any inherent reason for the 115 barrier, we do not know what it is. Moreover, while we know that it applies to advanced nations, the belief that it also limits more primitive peoples is mere inference.

Against the pessimistic actuarial view, we have a good deal of testimony, much of it from highly reputable physicians of unquestioned integrity, concerning enclaves of almost perpetual vigor and vitality where death comes longer after the century mark and where the greater killer-diseases of modern society are either rare or unknown.

These havens of arrested aging are generally in rather remote portions of the world or in areas with a topographical, linguistic or ethnic barrier between natives and outsiders. The two most important areas of reputed super-longevity are Abkhasia in Soviet Georgia and the Hunza country at the northeastern extremity of Pakistan in the giant Hindu Kush mountain ranges where Pakistan, Afghanistan, Sinkiang and Soviet Asia meet. There is also the small Vilcabamba montane valley in southern Ecuador.

The 1970 Soviet Census states that there are 4500 to 5000 centenarians in the Caucasus, of whom 1844 live in Georgia and 2500 in Azerbaijan. This gives 39 centenarians per 100,000 in Georgia and 63 in Azerbaijan against a corresponding U.S. figure of about eight. The Russians also claim possession of a citizen named Shirali Mislimov, who is stated to have been 168 years old in 1973 and hence probably the world's oldest living human being. Mislimov reportedly rides horseback and still tends his orchard. However, no Western correspondents, medical men, or scientists have been permitted to see him.

The immense age of the Hunzakuts is supported merely by the oral statements of those now living. The 40,000 inhabitants of this mountain region speak Burushaki which "bears no relationship to any other language on earth." No written records exist. The Hunza country began to attract world attention about 50 years ago because of the exceptional health of its old men and women. The collective image of immense longevity stems from this fact. We have no hard evidence which would reveal whether the claims are true or false.

The Vilcabamba region is a small, isolated, impoverished valley boxed off by mountains on all four sides. The 1971 Ecuadorean Census claimed that it possessed nine individuals over 100 in a total population of 819. This would correspond to more than two million centenarians in the United States. The Vilcabamba claims were based on baptismal records and on the testimony of friends and relatives of the super-aged.

ARE THEY REALLY THAT OLD?

Unfortunately, human beings are not trees. Since they do not add growth rings every year not even autopsies provide a basis for verification or disproof of claims to great longevity.

Scepticism concerning Hunza and Abkhasian longevity is based on the fact that no radically new environmental component has been found in these habitats that might explain a decisive breaching of the 115 age barrier. This does not mean that none exists.

If there is no authenticated record of any human being reaching 115, that does not mean that we can assume that human life is programmed for this upper limit. We do know that transplanted human connective cell tissue will subdivide exactly 50 times, then die. If the cell division process is artificially interrupted, then after a hiatus resumed, mitosis still stops at the 50th division.

But we cannot infer from this that the 50-division limit is built into the human life process. Nor do we know that it corresponds to 115 chronological years. Even if both statements should be true, we do not know whether there are environmental factors which might radically change the picture.

The vital importance of knowing whether the Hunzakuts and the Abkhasians have pierced the 115 barrier is that an answer would give us a better idea of just how rigid and inductable that programming for death is, assuming that it exists at all. Should we establish that it has been breached, we would want to know the extent to which genetic and the extent to which environmental factors are responsible. And if environmental conditions play a major rôle, we would want to know what they are and whether or not they can be replicated.

The Ecuadorean case for super-longevity is probably the weakest. The members of this toiling, almost destitute community—food intake averages 1200 calories or close to the hunger level—have gained international attention and probably material rewards from their claims. The Vilcabamba achievement is a source of national pride to Ecuador. Under these circumstances, we cannot overlook the possibility that birth and baptismal records have been altered. An alternate explanation is that we are dealing with one inbred familial strain of super-survivors, in short a case of genetic drift.

The Hunza case may be similar. Longevity claims are based on oral testimony. Topographical and linguistic isolation is combined with ethnic pride and unwillingness to mix their genes with those of their neighbors. The Hunzakuts boast partial descent from the soldiers of Alexander the Great who passed through their region in B.C. 328. The more isolated and self-contained a society, the greater its ability and perhaps its temptation, to deceive outsiders.

The Abkhassians are by no means inaccessible since they inhabit a portion of Soviet Georgia which descends from the Caucasus range to the shores of the Black Sea. Here the barrier is one of stock and language. The Abkhassians are largely endogamous. Their language contains 50 to 56 consonant phonemes, the sounds of which "cannot be represented by any combination of letters in an Indo-European alphabet." Their speech, which sounds like "gentle explosions" and includes "a wavering trill, whistling noises, and a prolonged buzz," is an unbreakable code for most foreigners. Until the Bolshevik Revolution of 1917, they had no written language. This communications barrier would enable Abkhassians to pretend to greater longevity than they in fact possess with little fear of detection.

The Soviet Government developed an interest in Abkhassian longevity by the mid-thirties. More recently, age documentation has been under the direction of G. E. Pitzkhelauri of the gerontological center in Tbilisi (formerly Tiflis), Georgia. He and his staff gave primary weight to such documentation as attestation of birth year by Moslem imams or Greek Orthodox priests. Other documentation included "letters or even carvings on doors," an intriguing observation since no Abkhassian alphabet existed until 1922-23.

Following the Soviet 1959 Census a detailed study was made of the oldest Abkhassians. The Soviet investigators asked the informants their ages at such important times as the outbreak of the 1878 war with Turkey, winters with unusually hard freezes, the dates of birth and marriage of their children, etc. If the answers yielded a reasonably coherent pattern, it was assumed that the respondents were telling the truth. In the example given by Dr Alexander Leaf, the answers given indicated that the person queried was between 131 and 142. This range of error seemed satisfactory to the American medical visitor. The underlying assumption was that the Abkhassians were mentally incapable of adding 20 to 50 years to their ages and coming out with reasonably consistent replies.

Is the whole thing a hoax? Not entirely. We have hard and convincing evidence that these people are singularly vigorous and

amazingly free from the most lethal diseases of old age. More than half a century ago, this gave them and the Hunzakuts an international reputation for exuberant health and hence for extraordinary longevity.

The first reason to suspect the reports of Abkhasian longevity is that these people provide a propaganda show window for the Soviet régime. Despite the fact that the Abkhasians owe whatever health and longevity they enjoy primarily to living conditions under the Czars, distinguished foreigners are periodically invited to Georgia to marvel at the vigor of these simple Soviet citizens.

The discovery of Abkhasian superlongevity began in the 1930s when the Stalin terror was getting under way. For a Soviet scientist to have publicly entertained doubts about the legions of Georgia centenarians in that era would have indicated a strong death wish. Under present conditions, scientists who advance negative evidence would not face equally dire reprisals. But since all publication outlets and academic and research positions are monopolized by the Soviet state such a sceptic would not only be jeopardizing his career and chances of advancement; he would probably be unable to publish his findings.

On the Abkhasian side, the motives for deception are equally compelling. Their reputation as Methuselahs has brought them droves of foreign and domestic visitors, flattering attention, fame and perhaps more material advantages. A dissenter would be deemed a betrayer of his people. The inbred character of the population, its possession of a language that hardly anybody else understands, and its patriarchal institutions are all conducive to successful deception.

As for the American and other Western scholars who have accepted the Soviet claims, there is no evidence that they were given opportunity to study the raw data from the interviews or that they had the linguistic competence to do so.

Thus, the Soviet claims concerning the advanced ages of their Abkhasian subjects should be viewed with scepticism. The similar Hunza claims are based on oral evidence. Those for Vilcabamba also seem dubious.

This does not negate the fact that the Hunza and Abkhasian regions are undoubtedly characterized by vigorous health and a comparative freedom from disease at advanced ages that the West lacks. An inquiry into the causes of that condition is potentially of great importance for the peoples of modern, industrialized societies.

PORTRAIT OF SHANGRI-LA

Diets are low in calories and lower in meat, fats and sugar than American and other Western norms. Either whole-grained

or coarse-ground cereals form the basis of nutrition. Hunzakuts and Abkhasians eat a great deal of fruit and vegetables, generally consuming them raw. Both peoples consume yogurt-like preparations: the buttermilk of the Hunzakuts and *matzoni*, a fermented preparation from the milk of sheep, goats and cows, of which the Abkhasians drink two or three glasses daily.

The average American adult consumes 3300 calories daily according to a U.S. Department of Agriculture study—100 grams of protein, 157 of fat and 380 of carbohydrates. In 1968, the National Academy of Sciences recommended that men over 55 consume 2400 calories with 65 grams of protein.

By comparison, a study of 55 adult male Hunzakuts by Pakistani nutritionist Dr S. Maqsood Ali showed average intake of 1923 calories with 50 grams of protein, 36 of fat and 354 of carbohydrates.

The Abkhasians are heavier eaters. Dr Pitzkhelauri found that a sample of over a thousand people, aged 80 and over and including more than a hundred reputed centenarians, averaged 1700 to 1900 calories. Moreover, 30 per cent of their calories came from meat and dairy products. There is a conflict of testimony as to whether they “have meat and wine every day” or meat only “once or twice a week.” While obesity is virtually unknown in Vilcabamba and the Hunza country, Dr Leaf encountered “an overweight centenarian, a phenomenon I would not have thought possible.” He also found an Abkhasian who claimed to be over 130 and to have smoked a packet of cigarettes daily for the previous 62 years.

One possible clue is Spartan eating habits during early life. In pre-Soviet times, the region was poor. Under Turkish domination, the Abkhasians lived on beans and other vegetables. Animal experiments indicate that a low-calory diet in the growth years stretches the lifespan.

In Abkhasia, married couples live considerably longer than celibates, separated persons, widows or widowers. Sexual life continues until old age. Dr Leaf, after talking to a large number of Abkhasians, concluded that they consider that a normal man loses his potency at 100.

“The general opinion of Abkhasians,” writes cultural anthropologist Sula Benet, “is that regular sexual relations should start late in life because abstinence will prolong sexual potency and promote well-being.” Men are supposed to postpone marriage till 30 and abstain from sexual intercourse until then. This practice probably contributed to the rugged health of the present generation. In a time of incessant feuds, brigandage, invasion, and endemic diseases, young men were prevented from siring children until they reached an age at which the weak, the slow, the incom-

petent and the unintelligent had been largely killed off. This tended to confine reproduction to the best and the sturdiest.

Abkhasians never retire. They continue to do field and farm work until advanced ages, choosing lighter tasks as they age. They die soon after they stop work. This may mean that the psychological impact of retirement is lethal or, perhaps more probably, that they are supposed to keep on working until their condition is terminal.

All sociologists, political scientists and cultural anthropologists who investigate these areas stress as a positive factor that the aged are an esteemed, working element of the community and that their advice is sought on all community problems. This practice may be feasible in static, tradition-bound societies concerned with perpetuating folkways. It would be much harder in modern societies where the leadership rôle involves mastering and applying a rapidly expanding corpus of technological and scientific knowledge.

One thing Abkhasia and the Hunza region have in common is that they are in the midst of some of the highest mountains in the world or else in montane valleys—the Caucasus and the Hindu Kush. However, photographs of these peoples who boast such extraordinary lifespans do not suggest that they have the characteristic physical type of the denizens of high altitudes. They do not seem to be barrel-chested folk with the outsize lung capacity needed to extract oxygen requirements from rarefied air.

Their mountain habitat may be relevant to their health in other ways. They breathe air of exceptional purity either because of remoteness from industrial and urban foci of pollution or because they are barricaded against them by mountains. They enjoy pure drinking water from the snow and ice melts of the high mountains. Their physical exercise involves incessant walking and climbing in rugged mountain terrain even for such prosaic tasks as fetching drinking water and fodder or herding sheep and goats. This almost certainly provides a far better stimulus to the heart muscle than the plodding labor of the coolies of the Asian lowlands.

Finally, the mountains isolate them genetically from outsiders. These barriers create separate languages, social customs, religions and dietary laws. The last are most important because people who are ritually forbidden to eat together do not sleep together.

The mountains are barricades against occupation by invaders. Thus, Sula Benet tells us that the Abkhasians have inhabited the same area for at least two thousand years and have avoided mingling their blood with that of strangers. This has given them

a fairly pure-bred strain which has been adjusted to their habitat at winnowing out those least able to meet its challenges. Mixed stocks and races provide variety and may therefore be better able to meet the changing challenges of advanced societies. Pure-bred stocks are more successful at tradition-bound adaptation to physical habitat.

FREEDOM FROM DISEASE

One of the most extraordinary features of these enclaves is that their inhabitants seem to be largely free from those degenerative diseases which kill off the great majority of old people in the western civilization area.

Robert McCarrison, M.D. (later Major-General McCarrison) reported in his pioneer work, *Studies in Deficiency Disease* (1921) that he had seen no cases of asthenic dyspepsia, gastric or duodenal ulcer, appendicitis or cancer among the Hunzakuts. As for the Abkhasians, Sula Benet claimed that Soviet doctors found "no cases of mental illness or cancer among the aged." Cases of arteriosclerosis were found "only in extreme old age."

However, the Georgian cardiologist David Kakiashvili, M.D., tested the lungs and hearts of the Abkhasian aged and found that "they have all kinds of cardiovascular diseases." They tolerate myocardial infection because "the constant physical activity required of them improves cardiopulmonary function so that the oxygen supply to the heart muscle is much superior to that in city dwellers." One might say that they have silent heart attacks and overcome them.

All investigators have accented the contrast between the vigorous aged of these primitive societies and the mental senility, invalidism, impotence and physical decay so common among the aged population of modern societies. The supposed moral is that the simple, natural life, uncontaminated by the institutions and techniques of civilization, can lead to exuberant health.

But can it? If frugal eating, constant exercise, consumption of whole grains, avoidance of excessive fats and sugars, and vegetable rather than animal diet are keys to health and longevity, how about the vast areas of poverty throughout the world in which these conditions prevail, but where life is short and sickness omnipresent?

The contrast between civilized man and the Abkhasians and Hunzakuts tells only part of the story. What is needed is an epidemiological survey that would isolate every one of the favorable conditions which supposedly contribute to the health and lifespan of the Hunzakuts and Abkhasians. It would find out what other regions in the underdeveloped portions of the globe

exist in which these conditions exist and whether they are there associated with health and longevity or with their reverse.

The fact that the whole Abkhasian population works, that nobody retires, that the children and the old toil part time is certainly not peculiar to the region. It is a general condition wherever you have poor but industrious people who are technologically backward.

The incessant climbing and scrambling from the valleys to the mountains is more or less common to all agricultural and pastoral hill people. Specifically, how about the transhumant peoples who spend most of their lives following their herds from the lowland winter pastures to the high meadows of summer grazing land? Vestiges of such societies remain scattered across the earth. They are not noted for longevity.

We do not know the answers to the most important questions. The longevity and exuberant-health enclaves have not been systematically analyzed with the techniques of modern medical and physiological research. Soviet scientists have studied the Abkhasians for decades and have come up with valuable findings. But the monopoly of Soviet scientific resources in the hands of the state and the propaganda value of the Abkhasian "miracle" militate against the objectivity that is needed if the keys to the superior health of this favored region are to be found.

Theodosius G. Dobzhansky

Theodosius Grigorievich Dobzhansky was born near Kiev. He studied at the University of Kiev and after graduation lectured in genetics at the University of Leningrad until 1927, when he went to the United States. He was noted for his studies on drosophila. He died on 18th December 1975 in Davis, California.

Race and Culture: A Case from the Bahamian Out-Islands

By ALAN G. LAFLAMME

The Bahamian archipelago consists of over 3000 islands with a combined surface area of about 4400 square miles. Only 1 per cent of these islands are inhabited at present. The Bahamian population is approaching 200,000 and has a density of about 45 persons per square mile. Censuses conducted by the Bahamian Government do not include racial information. Most estimates tend to agree, however, that the population is approximately 85 per cent Negro or predominantly Negro and 15 per cent Caucasian. Most Negroes are descended from slaves of West African origin; most Caucasians are descended from British settlers.

The vast majority of Bahamian communities are monoracial. One exception is that of Green Turtle Cay, a small island in the Northern Bahamas. Idiosyncratic patterns of manumission and land allocation to former slaves in the early nineteenth century account for this regional anomaly. Green Turtle Cay's 1968 population of 342 was 57 per cent Caucasian and 43 per cent Negro. Miscegenation has never been a common practice; hence, the two racially defined groups have experienced almost no gene-flow. To a lesser extent, Green Turtle Cay's two racially defined groups have maintained a degree of cultural distinctiveness as well.

Initial occupation of Green Turtle Cay took place during the 1780s. Loyalists from the rebellious American Colonies settled many Bahamian islands and brought their slaves along. Early attempts to establish a plantation economy failed. Green Turtle Cay's residents ultimately adapted to the island ecosystem through horticulture, fishing and a limited amount of commerce. Traditionally, their commercial ventures involved both Negro and Caucasian labour coupled with Caucasian entrepreneurial leadership. Allocation of jobs and material wealth has always been controlled by influential business organisers. The resulting socio-cultural system has maintained the dualism that the Loyalists and their slaves brought to the island. Cultural differences between Green Turtle Cay's racial groups run the gamut from occupational specialisations through social organisation to ideological tenets.

In terms of occupational specialisations, Negroes are more likely than Caucasians to be: farmers, masons, construction labourers, or domestic servants. Caucasians, on the other hand,