"As the sun rises higher in the sky with advancing spring, in some way the strengthening ultraviolet rays correct this calcium deficiency. Possibly this result is due to the irradiation of the ergosterol, which is a normal constituent of the skin; or possibly the ultraviolet rays ionize the calcium in the tissues so it is more diffusible.

"Whatever the method of their action, it seems true that 'ultraviolet rays are the natural stimulus of that great metabolic organ formed by the living cells of the epidermis.' "

Scientific evidence thus seems to add its weight to the natural inclination to get out into the spring sunshine.

Science News Letter, April 14, 1934

MEDICINE

Sunburn no Assurance Of Rickets Prevention

JUST because Johnny has a good coat of sunburn does not mean that he is being protected against rickets, it appears from studies reported by Drs. Arthur Knudson and Frank Benford, Albany Medical College, to the American Society of Biological Chemists. Rickets is a disease of the bones characterized by bowlegs and bulging forehead.

The rays of sunshine that produce sun tan, or erythema as scientists call it, are not as effective as other wavelengths in curing or preventing rickets, the Albany investigators found. The rays that are most effective in preventing or curing rickets are shorter, or farther away from the visible light, than the rays that produce the deepest sunburn. It so happens that at the wavelength where the rickets-preventing rays are at their peak, the sunburning rays have least effect.

Ultraviolet lamps and other radiation devices used by physicians and in the home for health protection are generally rated by the amount of sunburn they produce. Dr. Knudson's discovery shows that in some cases lamps that produce satisfactory and even painful sunburn are not the most effective means of protecting against rickets. In the summer sunshine of Albany, where Drs. Knudson and Benford did their work, it happens that the sunburning qualities of natural sunlight coincide with sufficient rickets-preventing qualities to make the sunshine give health protection as well as coats of tan. In the winter sunshine of the same region the anti-rachitic rays are practically absent although it is possible to get sunburn through long exposure to the winter sunshine.

Science News Letter, April 14, 1934

METEOROLOGY

Analysis of Stratosphere Air Verifies Pre-Flight Estimates

THE FLYERS who have recently ascended into the stratosphere were not traveling in totally unknown territory. True, no one had preceded them to such heights, but scientists working at their desks, without moving off terra firma, had formed an estimate of conditions to be found there.

Using as a basis for their calculations such data as those obtained from observations of the way sound travels along the surface of the earth, and the way radio signals are returned from the electrified reflecting layer of the atmosphere, physicists were able to calculate the composition of the atmosphere at great heights. Their calculations have now received verification from analysis of the samples of air brought down from a height of nearly 12 miles by the Soviet balloon "USSR."

Drs. H. B. Maris and E. O. Hulbert, working at the Naval Research Laboratory, and Dr. B. Gutenberg at the California Institute of Technology, discovered from their calculations that the air high above the earth, as well as that near the surface, is warmed by the sun during the day and cooled by its own radiation at night. This daily variation in temperature must give rise to winds, they reason. And winds inevitably mean a mixing of the air that would cause the composition to be uniform.

The proportions of the gases in the air remain the same, they conclude, up to the great height of about 100 kilometers or 62 miles, except for ozone, which exists in greater proportion above 30 miles than it does at sea level.

Dr. Gutenberg has based his results, besides, on the spectrum of the auroras and on the height at which meteors appear. Furthermore, the fact that helium enters the atmosphere from the ground in such quantities that it should form a noticeable part of the stratosphere but that only traces have been observed, seems to indicate that this gas escapes from the atmosphere into the interstellar space, and the same seems to be true with hydrogen. The conclusions of Dr. Gutenberg are that we have very probably an increasing temperature in the stratosphere, beginning at a height between 30 and 40 kilometers (about 20 miles), no noticeable change of composition at least until a height of about 100 miles, no hydrogen at any height, a slowly decreasing amount of oxygen at heights of some hundred miles and, probably, small amounts of helium or water vapor or neon at very great heights. The principal gas at any height is nitrogen.

Since the samples obtained by the "USSR" showed the same proportions of oxygen, nitrogen, and other gases as are contained in the air we breathe at sea level, the physicists look upon this finding as evidence of the correctness of their theoretical predictions.

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PHYSIOLOGY

Effects of Alcohol on Mind and Body Summarized

WITH the legal status of alcoholic beverages settled, discussion now returns to the question of how alcohol affects the human body and mind.

Dr. Haven Emerson, professor of public health practice in Columbia University, has listed in his new book *Alcohol, Its Effects On Man* (D. Appleton-Century) the following fifteen points on which he says medical scientists who have studied the subject agree:

1. Alcohol is a narcotic which, by depressing the higher centers, removes inhibitions.

2. Outside of the nervous system and the digestive tract, alcohol used as a beverage has little demonstrable effect.

3. It is a food, utilizable as a source of energy and a sparer of protein, but it is such only to a very limited extent.

4. It is improbable that the quality of human stock has been at all injured or

adversely modified by the long use of alcohol, although the effects on the individual are often devastating.

5. The therapeutic usefulness and value of alcohol are slight.

6. It may be a comfort and a psychological aid to the aged.

7. It does not increase, and it sometimes decreases, the body's resistance to infection.

8. By releasing inhibitions, it makes for social ease and pleasure, and herein lies one of its great dangers.

9. Its effects are best studied by changes of conduct.

10. It impairs reason, will, self-control, judgment, physical skill, and endurance.

11. It may produce situations from which crime and social lapses result.

12. It is a frequent destroyer of health, happiness, and mental stability.

13. Its use commonly lowers longevity and increases mortality.

14. It is used primarily for its psychological effect as a means of escape from unpleasant reality.

15. It constitutes an important community health problem.

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Government scientists who have been experimenting with the freezing of vegetables to preserve them report that, in all cases, the flavor and general appearance of experimental lots of frozen vegetables were superior to vegetables canned by the usual heat process, both before and after cooking.

VITAL STATISTICS

70-Year Life Expectancy Seen for Child of Future

Today's Boy Baby Anticipates 59 Years of Life, Girl 63, With Chances for Older Age After Perilous First Decade

HOW LONG will you live?

The uncertainty of life is just as great as it ever was, and no man knows when the shadow of death will pass over him. But statisticians are able to figure from the death rates and the success of physicians in their battle against diseases, what the average length of life will be for the United States. This is, in fact, a routine practice on which are based the premiums set on life insurance policies.

Drs. Louis I. Dublin and Alfred J. Lotka, statisticians for the Metropolitan Life Insurance Company, have compiled tables showing how long people living today may reasonably expect to continue in this world, and also their chances of dying of certain diseases. Going even further, they have predicted what will be the greatest average length of life that can be reached in the future with our present knowledge of medicine and sanitary science. These are made public in a report to *Human Biology*.

The child born today, if a boy, may expect to live 59 years. He has a five-year advantage over his brother born about ten years ago. The 1919 or 1920 boy infant had an expectation of life at birth of 54 years.

The child born today, if a girl, may expect to live for nearly 63 years, and she has a six-year advantage over her sister born in 1919 or 1920.

The child who has already survived the perilous first ten years of life, however, has a much better chance. If a boy, he may expect to reach the age of nearly 65. If a girl, she may pass the 67-year mark.

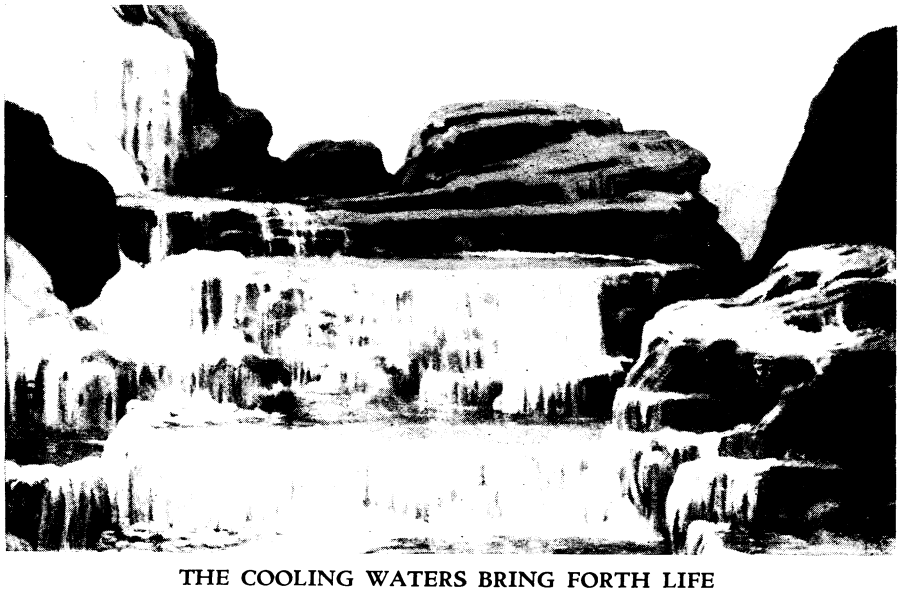
In case you have already struggled along to the age of 60, you may expect to live another 14 years if a man or nearly 16 years if a woman.

But the child born in the future may well expect to reach the Biblical three score years and ten.

What will you die of? No matter what your age is, the chances are greatest that you will die of heart disease. Organic heart disease is, today, the leading cause of death. In general, the old-age diseases—heart trouble, diabetes, accidental falls and cancer—show a great increase as causes of death when compared to the fatalities of the early part of this century. This is partly due to the comparative lack of progress in mastering the diseases of old age, partly to the fact that the population is aging—there is a greater proportion of the aged amongst us now—but partly to the more pleasing fact that children's diseases are being conquered to a remarkable extent. Many of the lives of little children that under previous conditions would have been carried off by the pathetic diseases of children such as diphtheria, infantile diarrhea, and tuberculosis, are preserved for another fate.

Death is something that may be postponed, but can never, no matter what the extent of our medical skill, be eliminated. He who does not die today will live to die another day, possibly of an automobile accident. That is now listed as tenth in the leading causes of death.

Science News Letter, April 14, 1934



THE COOLING WATERS BRING FORTH LIFE

The first forms of life on this planet, when its primal volcanic forces had subsided enough to permit water to exist as a liquid (though still hot) may have been lower algae such as now inhabit hot springs terraces. Charles R. Knight has painted his conjecture of such an early life scene as a mural in the Field Museum of Natural History.