

NUTRITION

Good Diet Gives Vitamins

➤ MOST PEOPLE can receive enough vitamins from a proper diet. They do not need extra vitamin preparations, the council on foods and nutrition of the American Medical Association stresses.

The council criticizes some national surveys which indicate that some people suffer from vitamin deficiencies because they do not receive sufficient varieties of food.

Vitamin pills or other preparations are unnecessary for individuals who maintain a diet that meets the recommended dietary allowances developed by the food and nutrition board of the National Research Council, the AMA council states in the *Journal of the American Medical Association* (Jan. 3).

In fact, an extra dose of vitamins A or D can cause serious harm, the council points out.

"Generalization of survey findings as a basis for vitamin supplementation of healthy individuals is not rational. The methodology employed in these surveys and the standards used for interpretation have

varied considerably. It is necessary for the physician to evaluate each person individually," the council says.

Vitamins are essential nutrients, and their usual source is food. All of the nutrients essential to maintain health in the normal individual are supplied by an adequate diet.

The AMA council did agree, however, that there are some situations where vitamin supplementation is both necessary and desirable. It may be useful during periods of illness or a deranged mode of life that may result in impairment of absorption of nutrients or deterioration of dietary quality. Some babies also need supplements, they point out.

In conclusion, the council stresses that public health will best be served by insistence on a factual basis for vitamin supplementation and therapy. It is sound judgment to emphasize repeatedly that properly selected diets are the primary basis for good nutrition.

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BIOCHEMISTRY

Chemical Energy for Body

➤ A "PRECISE chemical mechanism" has been proposed as the key to how the living organism converts food to chemical energy.

It is the pyridine nucleotide cycle, Dr. Theodore I. Bieber of the University of Mississippi said. The pyridine nucleotides, which are substances of widespread biological occurrence, apparently play a crucial role in the hydrogen transfer needed to make ATP.

It is the chemical energy of ATP, or adenosine triphosphate, that provides the living organism with the "ready cash" of energy needed to function properly, the chemist explained.

In the pyridine nucleotide cycle, ATP molecules are generated with the movement of hydrogen atoms in the so-called respiratory chain. The nucleotides do not undergo

any permanent changes in the cycle, but are regenerated thus providing a continuing source of ATP.

Considerable experimental evidence is presently available for the pyridine nucleotide cycle, Dr. Bieber told scientists at the American Association for the Advancement of Science meeting in Washington. Studies of the living cell indicate that the chemical processes occurring can be explained by this mechanism.

"If it should be definitely confirmed," Dr. Bieber concluded, "then a major biochemical mystery would be solved, and research for the conquest and prevention of the deteriorative diseases, such as cancer, could be conducted on a more rational basis and hence with greater confidence."

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GEOPHYSICS

Propose Crater Theory

➤ HUGE BUBBLES of gas bursting through the moon's surface may be the cause of lunar craters.

Two British scientists proposed in a new "blow-hole theory" that gases trapped under the surface when suddenly set free would form craters resembling those observed on the moon.

Among other current theories are those attributing the formation of craters to meteorite impacts and volcanoes.

The scientists, Drs. A. G. Gaydon and R. C. M. Learner of the department of chemical engineering, Imperial College of

Science and Technology, London, say recent reports of volcanic activity on the moon stimulated them to develop their theory.

Some years ago, Dr. Gaydon had observed blow-holes forming as he was evacuating gas from a flask containing magnesium carbonate. It appeared that trapped gas burst through the carbonate surface leaving patterns of rings that closely resembled lunar craters.

With the help of Dr. Learner, he continued his flask experiments varying the air flow through the carbonate and other powdery substances. In many cases, the

results were rings with steep inner edges and less steep outer edges. Sometimes a small "pimple" remained in the center, similar to those in a number of moon craters.

They remarked that the moon's loose, sandy surface is congruous with their theory. It would not be necessary to have the high subsurface temperatures that are usually associated with volcanic activity.

Drs. Gaydon and Learner believe that the meteorite theory does not explain circular craters in cases where the surface is struck at an angle rather than head-on. Such craters should be oval in shape, they report in *Nature* (Jan. 3).

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ROCKETS AND MISSILES

Ion Rocket Seen Practical For Interplanetary Trips

➤ AN ION rocket powered by a nuclear reactor is a "practical" method for travel between earth and planets, Dr. T. Merkle of the University of California Radiation Laboratory, Livermore, reported.

The rocket would have to start on its interplanetary trips from an orbit far above the planet's surface because the ions would not give it sufficient thrust to climb through the earth's atmosphere, he told the American Nuclear Society meeting in Detroit.

The ion rocket could, however, give very slight thrusts of about one-thousandth of a "g," or a thousandth the pull of gravity at the earth's surface. Dr. Merkle illustrated the use of milli-"g" systems as follows:

"Suppose we lived on a perfectly smooth planet with no atmosphere. Then if a frictionless railroad could be constructed on a great circle and a milli-"g" rocket mounted on a car on that path, in due course the velocity could be built up to 'surface satellite' velocity.

"From that time onward an ever increasing adiabatic (without gain or loss of heat) expansion of the orbit would occur. Thus a milli-"g" system could go anywhere providing the energy supply held out and the passengers did not die of old age."

Technical problems being explored in the development of a nuclear reactor for rocket propulsion and some problems that must be overcome before space travel becomes a reality were reported by Dr. R. E. Schreiber of the University of California's Los Alamos Scientific Laboratory. Dr. Schreiber heads the division concerned with Project Rover, the program to develop a nuclear rocket propulsion.

One major problem to be licked is to develop materials that can withstand temperatures of more than 3,600 degrees Fahrenheit. A nuclear reactor for a rocket would be run at high power densities, which means high heat fluxes and a serious thermal stressing problem. It would be possible to burn up the reactor in a few minutes if the coolant or propellant flow and power are not carefully balanced, Dr. Schreiber said.

Some of these problems may be answered by the Los Alamos Kiwi-A reactor now at the Nevada Test Site.

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