

PHYSIOLOGY

College Athletes Weigh More at Middle Age

► VARSITY LETTER athletes are more likely to pick up excess poundage than non-athletic classmates.

Dr. Wayne W. Massey, associate professor of physical education at the University of California at Los Angeles, based this conclusion on an extensive survey of graduates who now average 44 years old.

Varsity letter winners and non-athletes were questioned concerning their present health, marital status, military record, and economic success. Dr. Massey found few significant differences between athletes and non-athletes in most of these categories. Both groups reported that their health was good and that their economic status was satisfactory.

In the caloric battle, however, the varsity letter winners, who weighed an average of 167 pounds on graduation, had gained an average of 22 pounds since college compared to only 15 pounds for the non-athlete. Dr. Massey emphasized that these data do not necessarily have any medical significance nor do they imply that college sports activity is bad for health later.

Sixty-one percent of the athletes had served in one of the military services compared to 48% of the non-athletes. And 95% of the athletes were married compared to only 91% of the non-athletes.

Science News Letter, March 5, 1955

AGRICULTURE

Atomic Radiation Makes Trees Into Cattle Feed

► ATOMIC RADIATION is now capable of making the earth's forests the largest potential source of cattle food in the world.

By subjecting trees to atomic radiation, scientists are now able to transform wood into a digestible livestock feed. Although wood has been converted into feed by chemical processes in the past, the fact that irradiation can do the job may provide the world with a vast emergency storehouse of livestock feed.

There is now enough waste radiation available to make the transformation of wood into feed economically practicable. Heretofore, wood made into feed was not able to compete favorably with natural fodder.

Early in World War II, the Germans first made wood into a livestock feed because they did not have enough natural grains for both humans and livestock. Although the ersatz feed was not the best substitute, it was used effectively. The United States, on the other hand, has never faced the need to use a substitute for natural grains.

Experimentally, scientists have converted wood into molasses for animal feeds for many years now.

By the process of hydrolysis, in which the wood is placed in a slightly acidic bath and

percolated, the indigestible lignin fiber has been separated from the cellulose. It is the cellulose which animals are able to convert into starch and then sugar through the action of enzymes.

Humans do not have the same enzymes and cannot convert cellulose from grasses, stalks or wood into the carbohydrates necessary for their food.

Conversion of wood into animal feed by irradiation was made known by Dr. Samuel S. Jones, a scientist at the General Electric Knolls Atomic Power Laboratory, before a meeting of the Society of the Plastics Industry of Canada at London, Ontario.

Dr. Jones was describing the effects of radiation on materials in the vicinity of atomic reactors. He explained that radiation can melt certain rubbers, harden or powder certain types of electrical insulating materials and decompose paint.

Science News Letter, March 5, 1955

NUTRITION

Turns Angel Food Cake Into Bread for Dieters

► A GLUTEN-FREE bread, which it is hoped will benefit adult sufferers from sprue and child sufferers of celiac disease, has been developed at the household science faculty of the University of Toronto by Miss Betty Upton, who is also a dietitian at the Toronto General Hospital. She developed the gluten-free bread by starting with an angel food recipe.

Many sufferers of sprue and celiac disease, a digestive illness, cannot digest ordinary bread. Attempts to make a palatable gluten-free bread in the past have failed because the final loaf contained too much baking powder, giving it a chemical taste. Miss Upton arrived at the product by starting with angel food cake and working back toward bread.

Her tasty gluten-free bread contains potato flour, egg white, tetrasodium pyrophosphate, calcium lactate, finely ground bran, cream of tartar, salt and sugar.

One of the big problems, starch without using grain flour, was licked with potato flour. To help the loaf retain its structure, egg white was added. The tetrasodium pyrophosphate, used to give quick puddings their body, gave the recipe body, while calcium lactate, a milk derivative, gave it needed calcium.

To make the bread look and taste like traditional bread, finely ground bran was introduced. The bran was pre-soaked in egg white before being added to the batter to eliminate dryness. The gluten-free bread is tasty, will toast, slice and freeze perfectly.

Development is now being centered on making the bread in commercial-size tins, after which it will be tested by the department of therapeutics of the University of Toronto's Faculty of Medicine, and then will be made available to patients of the Toronto General Hospital.

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IN SCIEN

CYTOLOGY

Attack Cancer Cell Nucleus by Enzymes

► HITTING THE nucleus of the cancer cell by enzyme chemical treatment has prolonged the mean survival time of laboratory animals with certain cancers by 15% to 183%, Dr. L. Ledoux of Brussels reported in *Nature* (Feb. 5). The finding was made while Dr. Ledoux was working at the Chester Beatty Research Institute of the Royal Cancer Hospital, London.

The enzyme Dr. Ledoux used is ribonuclease which breaks down ribonucleic acid, one of the acids in the cell nucleus. In most of the experiments nucleotides, compounds into which nucleic acid is split by enzyme action, were given with the ribonuclease. This was done because Dr. Ledoux had previously found that the nucleotides were important for action of the enzyme.

The experiments involved 300 animals carrying the Ehrlich or Krebs mouse cancers or the Walker rat cancer. The enzyme treatment was given from two to 13 days after the cancer had been implanted.

Dr. Ledoux called the increase in survival time of the animals "significant." The experiments seem to show, he said, that cell multiplication can "in fact" be modified by changing the level of ribonucleic acid in rapidly growing and reproducing cells.

The enzyme action he reported is, he thinks, similar in principle to the action of another enzyme, xanthine oxidase, on spontaneous breast cancer in mice which Prof. A. Haddow reported to the British Empire Cancer Campaign.

Science News Letter, March 5, 1955

GENERAL SCIENCE

STS Winners Tour Naval Ordnance Lab

See Front Cover

► WINNERS OF the Fourteenth Annual Science Talent Search heard an explanation of the Naval Ordnance Laboratory's pressure chamber for testing underwater devices given by Alfred W. Baldwin, an engineer with the Laboratory's technical evaluation department, as shown on the front cover of this week's SCIENCE NEWS LETTER. The young scientists also learned about the place of plastics in ordnance today.

During their five days in the nation's capital, at the Science Talent Institute, the Search finalists visited the National Bureau of Standards, the Army Medical Service Graduate School at Walter Reed Hospital, and the cyclotron at Carnegie Institution's department of terrestrial magnetism.

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CE FIELDS

SURGERY

Pre-Graft Treatment Improves Surgery

➤ A TREATMENT that may lead to bigger and better spare part surgery for grafting not only skin but whole organs may develop from research by Dr. Nathan Kaliss at Jackson Memorial Laboratory in Bar Harbor, Me.

The difficulty in making grafts "take" and grow in another's body can be overcome, for mice at least, by previous injections of antiserum, he found. The antiserum in the experiments came from the blood of rabbits which had had mouse tissue extracts injected into them.

The experiments were successful for grafting mouse cancers onto mice that ordinarily will not grow such cancers. Grafts of normal tissues to similarly pre-treated mice did not survive. Whether this is due to a basic difference between cancers and normal tissues is not known.

In announcing Dr. Kaliss' findings, the American Cancer Society which supported the work points out that no clinical experiments have been conducted or are contemplated in this center of fundamental research. But the results of this work raise the question of whether skin grafts and organ transplants might be effected between humans by using similar techniques.

Science News Letter, March 5, 1955

METEOROLOGY

Aurora Not a Curtain But Myriads of Rays

➤ DISCOVERY OF what the aurora borealis is made of was announced by Drs. Henry G. Booker, Benjamin Nichols and C. W. Gartlein of Cornell University, Ithaca, N. Y.

The auroral display, which looks like a curtain of shimmering light, is actually composed of hundreds of thousands of relatively tiny rays. The lifetime of each raylet is less than a second.

The rays, columns of ionized air, are continuously forming and fading along the invisible lines of the earth's magnetic field. They measure about 300 feet across and a mile or two in height.

Reflection of radar and radio beams from the northern lights gave the Cornell scientists new information for their theory. To get full use of the signals, the beams must be pointed at right angles to the aurora, the scientists found.

Protons thrown out by the sun and smashing into the earth's outer atmosphere trigger the aurora, Dr. Nichols said, by producing electric fields that give the auroral display.

The northern lights can shift about 300 to 3,000 feet a second. This speed is less than would be expected if proton bombardment were directly responsible for the formation of auroras.

Since the raylets are formed almost instantaneously and decay so rapidly, they look solid when viewed in depth from a distance. When seen overhead, an observer is actually looking at the ends of many ray columns.

The radio and radar observations were compared with photographs analyzed by Dr. Gartlein using high resolution and a spectrophotometer. His work showed that the raylets can be detected in visible light as well as in the radio range.

Best results in studying northern lights by radio are obtained when the display is near the horizon rather than overhead. Kenneth Bowles and Ralph Dyce, Cornell graduate students who spent two summers in Alaska observing auroras there, found this true even in the far North where displays are visible almost every night.

Auroras do odd things to radio waves. They disturb long-distance short-wave communications, but boost the distance that television and other very high frequency waves can be beamed by acting as reflectors.

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MEDICINE

Some Ills May Be Caused by Antibodies

➤ "EAGER BEAVER" defense forces in our own body, which damage tissue in the process of combatting foreign substances, may cause rheumatic fever, arthritis, kidney diseases, allergies, RH disease and similar maladies.

This is suggested in studies by Dr. Harrison Latta, associate professor of pathology at the University of California at Los Angeles Medical School. The investigation is being supported by the U. S. Public Health Service.

Dr. Latta is studying the effect of antibodies, which have the job of destroying foreign substances in the body, on individual cells.

Apparently when they attack foreign substances away from walls of tissue cells they perform their mission effectively. But when foreign substances gain a foothold on a cell, complications arise. The antibodies may pursue the "enemy" so vigorously as to damage our own cells.

The damage may be in the form of changing the permeability of cell walls, which may upset the cell's osmotic pressure. This apparently causes a sudden change in cellular components and in cell function. Such a reaction would result in damaged tissue and may explain many maladies.

The study of this mechanism is expected to reveal more about how proteins go in and out of cells. Thus may be gained a better understanding of how viruses, which are large protein molecules, penetrate cells.

Science News Letter, March 5, 1955

NUTRITION

Potato Flakes, Bars And Puffs Are Coming

➤ HOUSEWIVES, GI's, party-goers, restaurant owners and children are all in for a sackful of new potato treats.

Potato users will soon be able to have potato flakes, potato puffs and potato-chip bars. All three new food developments are products of dehydration processes made recently by government scientists.

The potato flakes are dehydrated mashed potatoes. Developed at the U. S. Department of Agriculture's Eastern Regional Research Laboratory, Wyndmoor, Pa., they are described as tasting somewhat like a baked potato after being transformed from flake to mash by simply adding hot water or milk and whipping.

Scientists at the Eastern Laboratory are also responsible for the potato-chip bar developed primarily as a "high-calorie, high-density military ration with taste appeal." The potato-chip bar takes up only one twentieth the space needed for an equivalent amount of ordinary potato chips.

The third new potato treat was developed at the Western Regional Research Laboratory, Albany, Calif., and is a "fat-free, pillow-shaped, puffed potato tidbit that can be flavored and has an attractive crunchy texture and toasted color."

Potato puffs, say the researchers, are good for "out-of-hand" eating, as a breakfast food, and in soups, stuffing and casseroles.

The three dehydrated potato dishes are new developments in the history of drying potatoes for preservation that dates back 2,000 years. They are reprinted in *Agricultural Research* (Feb.).

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AGRICULTURE

Mud May be Source Of Agricultural Lime

➤ WASTE MUD that piles up at alumina extracting plants may become a new and economical source of agricultural lime.

The brown mud that is left over when alumina or aluminum oxide is extracted from bauxite ore has been found to contain 47% lime. In recent tests, U. S. Department of Agriculture scientists at the plant industry station, Beltsville, Md., reported that the mud proved comparable to ground limestone and hydrated lime as a corrective for soil acidity.

"Normal liming with brown mud," the government testers stated, "produced no toxic effects on sweet clover plants. Emergence, growth and yield of sweet clover grown in initially acid soil limed with brown mud were excellent and equal to results from regular liming materials."

Alumina extractors, they stated, wind up every year with about 500,000 tons of waste brown mud. The scientists reported their findings in *Agricultural Research* (Feb.).

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