creatures produces more abnormalities.

In the state hatcheries two-headed fish are not unusual, and instances have been noted of five perfect heads to a single body and tail. While these fish do not generally live past the stage when artificial feeding becomes necessary, they occasionally do live to the adult stage.

A few years ago a legal-sized perch having two heads was caught in a lake near Cadillac.

Science News Letter, July 16, 1932

PHYSIOLOGY

Diabetic Burns Fat Instead Of Sugar During Exercise

EXPERIMENTS showing that sufferers from diabetes probably burn fat instead of sugar when they exercise or do muscular work were reported by Dr. William H. Chambers of Cornell University Medical College to the American Association for the Advancement of Science meeting in Syracuse.

When the pancreas fails to produce enough insulin, diabetes follows. Scientists differ as to whether the diabetic condition is caused by an overproduction of sugar from fat or is due to a loss of the ability to burn sugar, Dr. Chambers pointed out. Recent studies of diabetics during exercise have seemed to show that they burn some sugar during exercise and that therefore the overproduction idea was correct. Dr. Chambers' studies, on the contrary, indicate that this theory is probably not correct and that even during exercise the diabetic is burning fat and not sugar.

The method of determining whether the body is burning fat or sugar consists of measuring the ratio of the carbon dioxide output to the oxygen intake. When fat is burned the quotient of carbon dioxide divided by oxygen is 0.71, and any rise in this figure shows that sugar is being burned, he explained.

His investigations showed that there was a rise in this figure during exercise in diabetic animals, but he also made measurements during the rest or recovery period following the exercise and studied the blood composition during this time. From these findings he concluded that the rise in the figure for the diabetic during exercise is due to change in the acid-base balance of the body and not to the burning of sugar, and that consequently the diabetic burns fat for fuel during exercise as well as when at rest.

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PHYSICS

Cosmic Ray Intensity Varies With Change in Latitude

Dr. Compton's Findings From World-Wide Observations Question Theory Proposed by Dr. Millikan

COSMIC RAYS do not bombard the earth with equal intensity from all directions, but their strength increases with the distance north and south of the earth's equator, Dr. A. H. Compton, Nobel prize physicist of the University of Chicago, reports in the *Physical Review*.

This is the first report from an extensive world-wide survey during which many physicists are making observations in remote localities. Dr. Compton transmitted this initial report from the Tasman Sea, during travel to new observing stations after research at Hawaii, New Zealand and Australia.

Birth Cries?

The definite differences in the intensity of the cosmic rays at different latitudes shown by Dr. Compton's report are likely to upset present ideas of the origin and nature of the cosmic radiation. Dr. Robert A. Millikan, of the California Institute of Technology, like Dr. Compton a Nobel prizeman, has consistently found that the intensity of the cosmic radiation is independent of the latitude at which the observations are made. Dr. Compton's report does not confirm Dr. Millikan's findings.

Dr. Millikan has suggested that the cosmic rays may be the birth cries of the synthesis of heavy elements out of hydrogen and helium in the depths of the universe. This theory is based upon his findings from wide-flung researches that cosmic radiation bombards the earth equally from all directions. With Dr. Compton's report this theory is likely to lose support.

Strongest at Equator

Dr. Compton reports that so far as the measurements have gone they indicate "uniform variation with latitude, showing a minimum at or near the equator and increasing intensity toward the north and south poles."

At sea level, the difference between intensity at latitude 45 degrees and zero degrees is roughly 16 per cent. whereas at an elevation of 9,000 feet the difference is about 23 per cent. This would indicate, Dr. Compton says, that it is the least penetrating part of the cosmic rays which varies most rapidly with latitude. No significant variations with longitude have been noted.

Observations recorded in Dr. Compton's report include those made from Mt. Evans in this country, from the Jungfraujoch in Switzerland, as well as the measurements made by Dr. Compton and associates during this present extensive trip.

Prof. R. D. Bennett of the Massachusetts Institute of Technology has planned with Dr. Compton the world-wide survey which is being supported by the Carnegie Institution of Washington.

The cosmic ray research has claimed one life. Allen Carpe lost his life while climbing Mt. McKinley in Alaska in May on his way to Muldrow Glacier to make cosmic ray measurements. Prof. Bennett will take up the work that was thus interrupted.

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ENTOMOLOGY

Male Butterfly Carries Perfume for His Mate

DIFFERENT butterfly species seem to have their own individual taste in perfume. The perfume exuded by the scent scales of common American species of butterflies covers a wide variety of delightful odors resembling some of the more fragrant flowers, a report of Austin H. Clark issued by the Smithsonian Institution reveals.

Sandalwood, red clover, milkweed, crushed violet stems, dried sweet grass, violets, musk, mignonette, and sweet briar are among the flower fragrances imitated by the butterflies. Unlike fashions in the human world, it is the male who wears the perfume. Females of the same species whose males exude the delicate pleasant odors give off a powerful nauseating smell.

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