

of about two beats a day. Twice in every 24 hours the weight of the liver and of many of its analyzable constituents showed rhythmic increase a definite number of hours after the animals had eaten a standard meal.

When animals were fed at 9 o'clock in the morning, after going without food for several hours, an increase in the weight of the liver equal to about 30 or 35 per cent. had occurred by 5 in the afternoon, Dr. Higgins explained. At 9 in the evening the total weight of the liver had fallen so that its increase was about 16 per cent., but at 1 in the morning its weight was again as great as it had been at 5 in the preceding afternoon. Following this second increase in its weight during the night, the size of the liver gradually decreased until at 9 in the morning it weighed just what it did before the animal was fed 24 hours previously.

By shifting the hours at which the animals were fed, Dr. Higgins and associates found that the liver's rhythm was due to feeding and absorption of food constituents and not to the time of day. Six hours after eating a meal the animals' livers had increased essentially the same amount in weight, irrespective of whether the animals had eaten during the day or during the night.

*Science News Letter, April 29, 1933*

#### METEOROLOGY

## Solar Radiation Said to Change Weather Map

**V**ARIATIONS in the sun's radiation were credited with causing changes in the high- and low-pressure areas in the earth's atmosphere, by H. H. Clayton of Canton, Mass., who spoke before the National Academy of Sciences.

In a study of Smithsonian records extending back for twenty years, Mr. Clayton said he had discovered that pressure in high pressure areas was increased during periods of increased solar radiation, while the pressure of low pressure areas dropped. The centers of falling pressure, he continued, were in regions of low vapor content, while the centers of rising pressure were in regions of high vapor content, indicating activity by water vapor in determining the effect of solar radiation on the atmosphere. These centers were found to shift with the seasons. Correlations of solar radiation with rainfall have also been found.

*Science News Letter, April 29, 1933*

#### ASTRONOMY

# Solar System Hurtling South At 450,000 Miles Per Hour

## Long Search For Ether-Drift by Dr. Miller Reveals Influence of Earth's Motion on Velocity of Light

**F**OR THE FIRST time science is able to say whither and how fast the solar system is hurtling through space. Dr. Dayton C. Miller of the Case School of Applied Science, Cleveland, announced to the National Academy of Sciences that the sun with its earth and other planets is moving southward in the direction of the famous Great Magellanic Cloud of stars at the immense velocity of 450,000 miles per hour (208 kilometers a second or 125 miles per second) which is thousands of times faster than the ordinary airplane speed.

### The First Time

For the first time also Dr. Miller has detected positively the effect of the motion of the earth in its orbit around the sun.

This means that he has detected an "ether-drift." This is expected to have reverberations in the field of theoretical physics and astronomy.

Einstein based his principle of relativity on the fact that Michelson and Morley, American physicists, years ago attempted without success to find an effect of an all-pervading "ether" upon the velocity of light. Over a long period of years Dr. Miller has repeated the famous Michelson-Morley experiment with great refinements at Cleveland and at Mt. Wilson, Calif. In one series of experiments he made about 200,000 single readings of his delicate instruments which measure the shift of light interference fringes caused by the difference in time required by two beams of light from the same lamp to travel equal distances in different directions.

### Indirect Effect

The movement of the earth through the "ether" causes an indirect or second order effect in the interferometer used by Dr. Miller. So he concludes from a careful reanalysis of his extensive data just completed "without any pre-sumptions as to the results." He at last finds in the ether-drift observations the effect of the orbital motion of the earth

which has been suspected and searched for over a period of 46 years. What effect this reversal of the first results of the Michelson-Morley experiment will have on the "new physics" so fruitful today is not yet determined.

Dr. Miller in his first interpretations was misled by attempting to make the result fit into what seems to be a general drift among the closer stars toward the north. Actually it turns out that the solar system is rushing southward, with the apex of its cosmic motion in the southern constellation of Dorado, the swordfish, about twenty degrees south of the second brightest star in the heavens, Canopus. This point toward which the sun and its family are moving is almost perpendicular to the plane of the ecliptic in which the planets move around the sun.

"This suggests that the solar system might be thought of as a dynamic disk which is being pulled through a resisting medium, and which therefore sets itself perpendicular to the line of motion," Dr. Miller told the academicians.

Efforts to verify certain predictions of the so-called classical theories and the influence of traditional points of view were charged by Dr. Miller with having delayed the discovery of ether drift and the cosmic motion of the solar system.

*Science News Letter, April 29, 1933*

#### ANATOMY

## Childhood Characters Recall Simian Ancestry

**R**EMINISCENCES of our tree-climbing ancestry are to be found in the physical structures of children as well as in the stages before birth, Dr. C. B. Davenport of the Carnegie Institution of Washington told the National Academy of Sciences at its meeting. He reminded his hearers that "at birth the child is still far from an adult in proportions of parts, and has still to pass through a series of changes shown by adult primates."

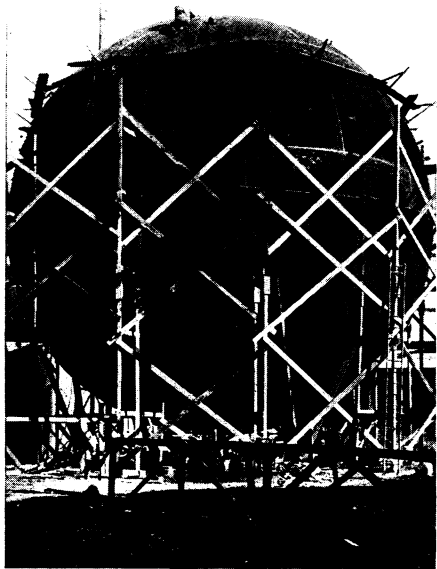
One of these childish characteristics

is the shape of the chest. This region in a baby is approximately cylindrical; only as growth proceeds does the human chest become wider than it is deep. The cylindrical shape is characteristic of the tree-climbing primates, Dr. Davenport said.

Another ancestral trait we show when we are very young is the rapid growth of the thigh region as compared with the lower leg. This predominance of the thigh is again a characteristic of tree-climbing animals. Later, at the age of eleven or twelve, the lower leg catches up and we become real ground-walkers.

Again, the full development of the foot as a ground-walking organ is realized only as we approach adolescence, when the simian-like low instep gives way to the truly human high foot arch. At the same time, the relative length of the foot decreases; quite long feet are common to children and apes. But while the foot is shortening the heel bone assumes relatively greater length; a short heel is another thing which young children share with simians.

*Science News Letter, April 29, 1933*



#### CONCENTRATED

More gas in the same amount of tank, is what the builders of this steel sphere 45 feet in diameter at Shrewsbury, Mo., really accomplished. This shape makes possible greater volume and higher pressures without excessive strain. (SNL, Sept. 13, '30, p. 175) The capacity is 162,000 cubic feet at 50 pounds per square inch. After 1,256 linear feet of seam were electrically welded the tank stood a soap suds test at 70 pounds air pressure.

#### PHYSIOLOGY

## Magnet Pulls Corpuscles Out of Circulation For Study

**P**PULLING blood cells out of the veins with a magnet is the novel method devised by scientists of the Rockefeller Institute who wanted to study a particular group of cells. The two ingenious scientists, Drs. Peyton Rous and J. W. Beard, described their method before the National Academy of Sciences.

The cells of this case are very active scavenger cells that quickly and thoroughly purge the blood of foreign matter by gobbling it up. These cells, known to scientists as Kupffer or reticulo-endothelial cells, are found in the liver, spleen, and bone marrow as well as the blood. They have been credited with a host of important functions, such as making the coloring matter of bile and making the germ-resisting antibodies that help us to ward off attacks of disease.

Exact knowledge has been lacking, however, largely because no one was

ever able to get the living cells out of the body for study. Now the Rockefeller investigators have done just that. Iron injected into the blood, in the form of highly magnetic iron oxide, is quickly gobbled up by these scavenger cells. This makes them highly attractive to a magnet. The iron-containing cells are loosened from their principal location in the liver by means of massage and a stream of fluid. They are then separated from the host of other elements suspended in the fluid and pulled out by the electro-magnet, just like so many iron filings.

The magnetically held cells are then washed and carefully released into a culture medium on which they will live and grow and where they can be studied directly. Drs. Rous and Beard are now conducting experiments to determine the functions of these cells.

*Science News Letter, April 29, 1933*

#### ETHNOLOGY

## Drinking Map of World Traced By Anthropologist

**F**ERMENTED drinks are widely distributed among the native cultures of world peoples, yet they are not universally distributed. There are extensive natural "dry areas" on the culture map of the world, Dr. John M. Cooper of the Catholic University of America stated before the Catholic Anthropological Conference.

In general, the primitive non-agricultural peoples did not have fermented beverages until they learned their use from white men or other races of more elaborate civilization than their own. The great "dry" areas of the map include practically all of North America above the present Mexican border and the great tundra and wilderness area of northern Eurasia. To the south, Patagonia and Fuegia in South America are natural "dry" areas, as is also that most primitive of continents, Australia, together with most of Polynesia.

The herdsmen-peoples of interior

Asia have a fermented drink made from milk of mares or camels, called kumiss. Elsewhere the agricultural peoples have native drinks based on their own products: grape wine and grain beer in the Mediterranean area, beer and honey mead in northern Europe, palm wine, beer and mead in Africa, rice and palm wines in eastern Asia, and maize beer or chicha in Mexico and South America. In all these areas there were small groups of primitive nomads who were still teetotalers although surrounded with drinking peoples.

Styles in drinking varied according to locality and race, Dr. Cooper pointed out. South of the Alps, steady but moderate drinking was and is the mode; in northern Europe the drinking bout ruled. Our own culture, deriving from northern Europe to a large extent, still preserves in "whoopie parties" the ancient drinking bout of our half-barbarian ancestors.

*Science News Letter, April 29, 1933*