

ASTRONOMY

Milky Way Distorted

► TREMENDOUS TIDAL FORCES, acting in much the same way as the moon pulls on the earth's oceans, distort the shape of the Milky Way galaxy in which the sun, earth and other planets are located.

It has now been found that the galaxy's outer edges are tilted with respect to its center plane.

The forces causing the bulging are at least ten times greater than would be expected to result from the gravitational pull of the Large Magellanic Cloud, a neighboring galaxy of the Milky Way.

The distortion was discovered independently by astronomers in the United States and in Australia from studies of the distribution in the Milky Way of neutral hydrogen atoms. These atoms act as miniature broadcasting stations, signaling their presence at the radio frequency of 1,420 megacycles per second.

Most of this hydrogen is close to the Milky Way's center belt, but the outer hydrogen nearest to the Large Magellanic Cloud is pulled toward it. The Milky Way

can be pictured as a disc-shaped pinwheel of billions of stars like the sun, and its neighbor galaxy as a much smaller blob of stars below it.

The hydrogen above the Milky Way's main line of stars is also distorted, but in a direction away from the Large Magellanic Cloud.

Dr. Bernard F. Burke of Carnegie Institution's Department of Terrestrial Magnetism has calculated that the distortion is at least 300 parsecs, an astronomical term equal to about six million billion miles. Gravitational pull could account for only one-tenth of this amount.

His results agree with those reached by Mrs. Frank J. Kerr, J. V. Hindman and Mrs. M. S. Carpenter of the Radiophysics Laboratory, Sydney, Australia, who made their studies independently.

The radio wave observations on which the results are based include those made at the Leiden Observatory in Holland as well as in the United States and Australia.

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ELECTRONICS

See Foreign Television

► TELEVISION VIEWERS in the United States may soon start picking up flickering pictures and ghostly images of telecasts from Europe and South America.

If they turn off their sets when they hear a foreign language and go outside, they may see the beautiful shimmering "northern lights," or aurora borealis.

The reason is the sun is rapidly approaching a high point in its 11-year cycle of activity. Sunspots are becoming much more numerous, and they affect the earth's magnetic field, resulting in serious disruptions of long-distance radio communications, auroras, erratic compass readings, and other unusual events.

Greatest interference with television reception can be expected on the low-numbered channels. Such countries as Mexico, Puerto Rico, Britain, Belgium, Germany, Spain, Switzerland, Brazil and Argentina televise programs in the range that might be picked up in the United States when atmospheric conditions are abnormal.

Already, National Broadcasting Company engineers have occasionally been able to resolve recognizable pictures from the British Broadcasting Corporation, using a British receiver and a special aerial system at Riverhead, Long Island. In London, the BBC is monitoring U. S. television channels.

The lowest frequency used in the United Kingdom is 45 megacycles for vision and 41.5 megacycles for sound. In the U. S., the lowest frequencies are those of channel two, 54 to 60 megacycles.

Reception of foreign channels here may

vary from a fairly clear picture with sound to all sorts of interference patterns and screeches, or a combination of these effects.

When the sun is very active and sunspots numerous, a layer of the earth's atmosphere called the "F" layer is affected. Ordinarily, this roof of ionized air, which consists of two layers between about 100 and 250 miles above the earth's surface, reflects shortwave radio frequencies, from about four to 30 megacycles, but at the peak of sunspot activity the bounce can occur much higher than that.

Auroras are most frequently seen near the time of sunspot maximum. They are formed when the outer fringes of the earth's atmosphere stops a stream of particles thrown out by the sun.

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SURGERY

Cure Neurotic Patients With Abdominal Surgery

► SUSPECTED psychoneurotic patients are being transformed into normal individuals by abdominal surgery, Dr. Sidney A. Rosenberg, chief of staff at Montefiore Hospital, Pittsburgh, told the International College of Surgeons meeting in Mexico City.

The operation is known medically as duodenojejunostomy and is a revival of a technique formerly used, but put in the background for about 20 years, Dr. Rosenberg reported. The operation connects two portions of the small intestine to by-pass

an obstruction caused by a compression of the bowel.

Large vessels supplying the bowel cross over the duodenum, the first portion of the intestine, and sometimes squeeze it and obstruct the passage of food, he said.

Although the symptoms of the trouble include nausea, vomiting, lack of appetite and abdominal distress, routine tests and X-ray examinations fail to show anything wrong. Then the patient is likely to be labeled psychoneurotic, the surgeon explained.

"It is very dramatic indeed to see a patient who has been tagged a chronic complainer, neurotic, or psychotic, develop into a well adjusted individual, grateful for the absence of symptoms, gaining weight and able to function economically and socially," he said.

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MEDICINE

Still Many Unknowns in Study of Lung Cancer

► A LONDON pathologist finds:

Cholesterol deposits have been found near malignant growths and may play a part in lung cancer.

Cigar smokers show less lung cancer than cigarette smokers, and if a cigar could be made like a cigarette, it would give smokers an alternative to "giving up smoking."

It is impossible now to tell whether one sex is naturally more susceptible to lung cancer from smoking than the other. To settle the matter, 10,000 persons of each sex would have to smoke a pack a day for 30 years and then the results studied.

These are some of the observations made in a review of cancer of the lungs, larynx and urinary tract by Sir Ernest Kennaway, department of pathology, St. Bartholomew's Hospital, London, reported in the *British Medical Journal* (Feb. 9).

A study of the incidence of all forms of cancer among smokers and non-smokers of both sexes, both town and country dwellers, is needed urgently, he said.

The higher incidence of various forms of cancer reported among town dwellers has been credited to better methods of diagnosis in towns, Dr. Kennaway noted. But any numerical estimate of the effect of better diagnosis is strictly arbitrary, he said.

Other possible reasons for the difference between town and country dwellers are atmospheric pollution by smoke, diet differences and changes in radioactivity.

What effect atmospheric pollution plus tobacco smoke have on cancer incidence is something about which we have much to learn, he reported. Data on a very wide range of atmospheric pollution are now available and if this can be correlated with those for smoking habits and for lung cancer it may be possible to decide the question.

If this additive effect does take place, smokers in one geographical area may be able to smoke more cigarettes with impunity than those in other more industrial ones.

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