

ASTRONOMY-PHYSICS

Keeps Stars Together

Dynamical friction is largely responsible for the continued existence of galactic clusters like the Pleiades, Hindu-American astrophysicist explains.

► **DYNAMICAL FRICTION** is largely responsible for the continued existence of galactic clusters like the Pleiades. It also furnishes a strong support for the short life of these clusters, a life of only about 3,000,000,000 years, points out the Hindu-American astrophysicist, Dr. S. Chandrasekhar, of the Yerkes Observatory. This period of 3,000,000,000 years is about the age of the earth, and therefore this theory has a bearing on the time scale for the universe.

The force acting on a star, believes Dr. Chandrasekhar, varies because of the relative motions between the stars. The period of such fluctuation would be roughly equal to the time required for an average star to cross the average distance between the stars, which is estimated to be approximately 10,000 years. While it would be practically impossible to predict what would happen to a given star, its probable course can be followed.

If a period much longer than the estimated 10,000 years is considered, the change in velocity of a star would be the result of the addition of a large number of such fluctuations. The simultaneous influence of numerous fluctuations acts as a brake upon a star and has a decelerating effect in the direction of motion.

This effect which causes each star to tend to hold back all the other stars is dynamical friction.

"It is friction because it has a decelerating effect on the motion of the star, and dynamical because it ceases to operate when the star is at rest and acts again only when it is in motion," explains Dr. Chandrasekhar.

On account of the fluctuations, stars may be expected to be accelerated beyond the velocity of escape and the rate at which this happens gives a clue to the life of the cluster.

If dynamical friction is ignored, the cluster will disintegrate within 100,000,000 years, Dr. Chandrasekhar believes. But if the frictional term is included, he finds that galactic clusters have lives averaging from 3,000,000,000 to 5,000,000,000 years.

This study into the dynamics of star clusters was presented by Dr. Chandrasekhar at the First National Conference on Physics held in May in Puebla. A number of outstanding American scientists attended the meeting at the invitation of the Mexican President Manuel Avila Camacho and the Governor of the state of Puebla, Dr. Gonzola Bautista.

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of them at older ages will be working at unaccustomed jobs requiring tedious standing, operating unusual pedal apparatus and in general using parts of the body not "acclimated for the strain."

Modern treatment of the condition when the valves in the superficial veins have become incompetent consists in an operation to close off the long vein of the leg, called the saphenous, near its junction with the femoral vein high up the leg, followed by injection of a chemical to sclerose or harden the vein and its branches. Examination six years after such treatment, Dr. Pratt reports, showed good results in a high percentage of patients.

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NUTRITION

Jackrabbit Should be Used To Ease Meat Shortage

► **JACKRABBITS** are pointed out as a wasted meat resource by B. Ashton Keith, Kansas City scientist. The long-legged, long-eared lopers of the prairies and plains are seldom eaten; though they are killed as range-robbers by ranchers, in great drives that slaughter thousands of them. The carcasses are either left for the crows and coyotes, or at best picked up to be processed into commercial dog food.

Yet, declares Mr. Keith, "Some of the pleasantest recollections of my boyhood are of fried jackrabbit, baked jackrabbit, jackrabbit stew and jackrabbit pie. Those delicious meals that Mother used to cook after we came in from a hunt on the prairies still make my mouth water."

F. C. Lincoln, zoologist of the Fish and Wildlife Service, confirms Mr. Keith's claims for the tastiness of jackrabbit meat if properly prepared. Most people, he thinks, consider jackrabbit unfit to eat because they try to use the same cooking methods with it that they use with the smaller, softer cottontail rabbit of the eastern half of the country. Cook it a bit longer and it will be just as good, he stated, adding, "Personally, I think it's even better than cottontail."

The same precautions against tularemia or rabbit fever must be observed with jackrabbits as with other wild rabbits, Mr. Lincoln warned. Dead rabbits must be handled only with gloves, the fur disposed of in such a way that no germ-carrying fleas can escape from it, and the meat must be thoroughly cooked.

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MEDICINE

Vein Trouble Forecast

A war-caused increase in the number suffering from varicose veins is expected. Operation and injection of a chemical to harden the vein is advised.

► **A WAR-CAUSED** increase in the number of men and women suffering from varicose veins is forecast by Dr. Gerald H. Pratt, of the New York Post-Graduate Medical School and Hospital of Columbia University, in a report to the *Journal of the American Medical Association* (July 17).

The condition affects women twice as often as men, but in a total war, Dr. Pratt points out, "men are subjected to strains that most of them are ill prepared to stand.

"The long periods of standing, fights through jungles and against icy winds and adaptation to the peculiar position necessary to man tanks, cramped cockpits or fox holes" are likely, in his opinion, to precipitate the development of varicose veins in the future.

Requests for information from the varicose camps indicate, Dr. Pratt reports, that the armed services are already having experiences with the problems.

Civilians, both men and women, will be more affected than usual because more