

ASTRONOMY

New Red Shift Theory

New explanation given for reddening of distant stars. Our universe not necessarily expanding. Laboratory confirmation believed impossible.

► A NEW explanation of the "red shift" on which the theory of the expanding universe is based was offered by Prof. L. H. Thomas, Ohio State University physicist, in a paper given before the American Physical Society meeting in Columbus, Ohio.

The observed reddening of distant stars has usually been explained as due to the motion of these stars away from us, and showing that our universe is expanding. This is similar to the lowering of the pitch of a locomotive whistle as the engine steams away. The sound waves, sent out with the same frequency, but from an ever-increasing distance, strike the ear with diminishing frequency and the pitch of the whistle is consequently lowered. In the same manner the light of a receding star is lowered in frequency, which is denoted by a "shift" toward the red end of the rainbow or spectrum.

But the idea of the expanding universe has met much opposition of late from some astronomers because they felt it would make the universe much too young. It would not give time for the evolution of the stars, for the groupings and arrangements which have taken place. Up to the present time no other satisfactory explanation of the reddening of the distant stars has been found.

That the shift of the entire spectrum toward the red end is not due to absorption of gases or other matter scattered in space between us and the stars is revealed by the fact that during a gorgeous sunset when the blue of the sunlight is absorbed, the wavelengths of the remaining red and orange light of the sun are unchanged.

Prof. Thomas believes the red shift may be due to a secondary effect of ordinary refraction, the slowing down of light waves as they enter a refracting medium. The medium receives a velocity in the direction in which the light is traveling when the front of a wave train, finite in length, strikes it. If there are no elastic forces and no friction in the medium, this velocity is lost when the last of the wave train passes. Neither the medium nor the progress of the wave

train is disturbed. But if there is friction, Prof. Thomas shows that there is a slowing down of the light so that the whole wave train is gradually reddened. He does not believe that this sort of reddening can ever be produced in the laboratory for experimental purposes.

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AERONAUTICS

Study Predicts Success Of Youthful Pilots

► A YOUTH'S success in learning to fly is determined largely by how ardent-

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RADIO

Radar—The Secret Word

► THE REMOVAL of radar from military secrecy wraps leaves many other questions unanswered, although the American people can now guess how important this radio-spotting and distance-measuring device is to the war.

For several years the existence of such an effective radiolocator has been known. Radar, although the word was not used, was described in broad outline by military officials in Congressional hearings in 1940. British officials in June, 1941, revealed the existence of their secret device for detecting airplanes.

The Army-Navy announcement definitely credits American scientists, as yet unnamed, with the beginnings of radar when they observed in 1922 that reception from a radio station was interfered with by an object moving in the path of the signals. In 1925 it was found that an object would bounce back radio signals, and in 1930 research engineers were able to pick up reflected signals from planes passing overhead. In 1934 they had developed a satisfactory means of measuring the distance between the radar transmitter and the target.

The fundamental principle of the radar is that ultra high frequency (very short) radio waves can be focussed and are reflected when they strike an enemy ship or airplane. Since these radio waves,

ly he wants to fly. Group Captain J. W. Tice, Director of Canada's Medical Services (Air), stated that the Royal Canadian Air Force, as a result of a recent medical survey, has wiped out many preconceptions used in air crew selection.

Group Captain Tice explained that the athlete was found to be at an advantage because of his better muscular control, but whether he was a successful golfer or goalie on the hockey team seemed immaterial.

The hay fever sufferer is not necessarily washed out now. The self-balancing test whereby the candidate was timed as he stood on one foot with eyes shut is no longer given.

They have found that the same percentage of university graduates and non-college students become successful pilots. Students who enlisted in air crew directly from school make better records than any class of working men; skilled craftsmen rate second.

like light, travel at 186,000 miles per second, a measurement of the very short interval of time allows the determination of the distance of the object.

Radars "see" through the night, fog or storms, and they provide data, according to the official statement, for anti-aircraft guns and for the direction of airplanes and warships.

The British version of radar, which they call the radiolocator, is credited in the official release with saving England during aerial blitz of 1940 and 1941. Radar now stands guard "at many danger points along United Nations frontiers and at sea, warning of the coming of aerial and sea-borne enemy forces."

The British, in making their revelation of their form of radar nearly two years ago, named Sir Robert A. Watson-Watt as the scientist who contributed largely to its development. As yet the American scientists who pioneered in this essential war industry and possible post-war industry have not been cited to the public.

The group of American scientists who were the inventors of radar will without question be considered worthy of the highest honors that can be bestowed upon them because of the great usefulness of radar as a military device.

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