

PHYSICS

Expanding Universe Theory Receives Blow in Discussions

Hypothesis that Rushing Apart of Distant Nebulae Causes Red Shift of Light Fails to Stand Mathematical Check

THE FAMOUS theory of cosmogony of the expanding universe, which postulated some primeval explosion that sent the stars and galaxies rushing apart, has received a serious blow. The attack occurred in scientific discussions honoring the memory of the Notre Dame chemist and botanist, Father J. A. Nieuwland, whose basic discoveries led to the development of synthetic rubberlike compounds.

Prof. Arthur Haas, famous Viennese theoretical physicist now on the staff at Notre Dame University, presented mathematical arguments and calculations showing that the famous observed red-shift of light from the distant nebula can hardly be due to an expansion, or rushing away, of these cosmic bodies from some central point. The interpretation of the red-shift as due to a velocity of motion has been the backbone of the expanding universe theory so often associated with the name of Abbé G. Lemaitre, noted Belgian scientist-priest.

Prof. Haas calculated the amount of energy which matter can create in a unit volume of the universe and finds it far too little to overcome the gravitational attraction that must be overcome if the different parts of the known universe are rushing away from one another in a super-expansion.

This new attack on the expanding universe comes close on the heels of the recent statement of Mt. Wilson Observatory's famed astronomer, Dr. Edwin Hubble, who admitted in a Carnegie Institution of Washington lecture that one could now either consider the universe expanding or not; with perhaps a shade of evidence on the side of the not.

Prof. Haas backed up his arguments by also making calculations showing the amount of energy per gram of matter which would be required to double the mutual distances between nebulae in a system of mutual density. His conclusions from this calculation were:

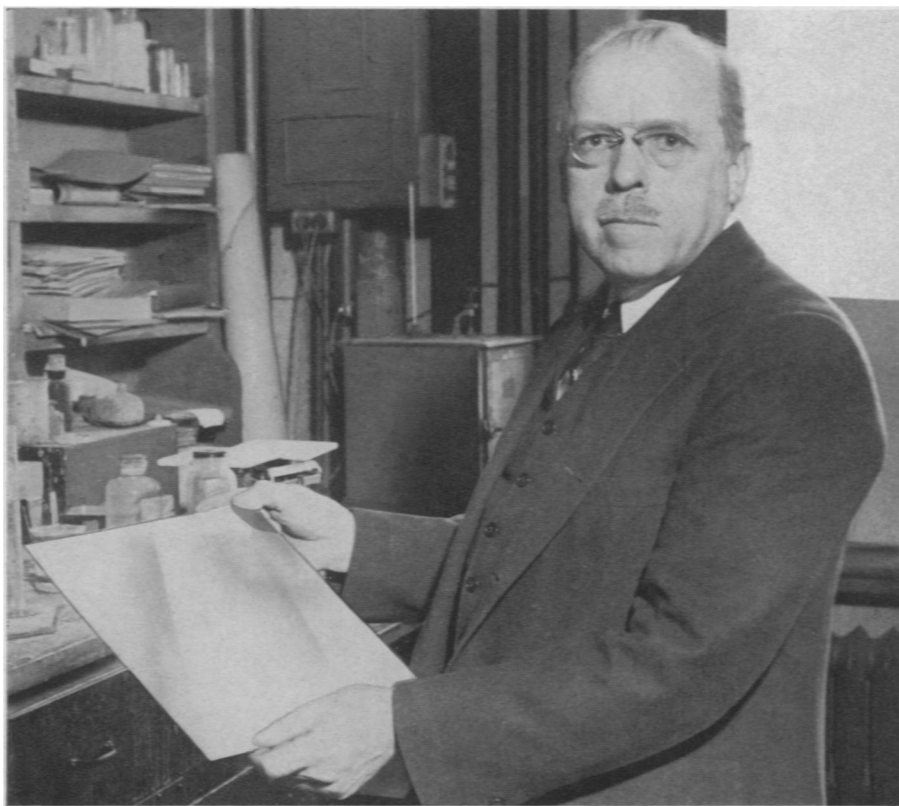
"A nebular system which exhibits the average mass density observed in the

extra-galactic region and which has already experienced a doubling of its linear dimensions, cannot possess a radius of more than about 6,000 million light years. This result seems remarkable because, if in the nebular system there is any expansion at all, we must assume that at least a doubling of the linear dimensions has already taken place. This conclusion cannot be evaded since a doubling requires only 1,300 million years, whereas the age of some terrestrial minerals was found to be 2,000 million years."

If astronomers abandon the idea that the reddening of the light from the distant nebula is due to their velocity of expansion then some other concept must be introduced to account for the observed red-shift.

Somehow or other the light from these far-away nebula has to lose energy en route so that its color is slightly redder than it was when it started. One idea would be that inter-galactic dust in the path would absorb some of the light ray energy.

But Prof. Haas demonstrated by calculation that the loss of radiant energy is of the same order of magnitude as the energy-production of matter. And he concluded by showing that every photon of radiant energy—whether it has high energy and short wavelength like an X-ray or low energy and a long wavelength like a radio wave—loses the same energy in traveling one single wavelength. This concept would account for the observed red-shift in light from distant cosmic sources.



BETTER TIN PLATE

Prof. Colin G. Fink, electrochemist of Columbia University, holds a rare sample of electroplated tin which may soon produce better and cheaper tin cans. A major trouble of the present dipping process for putting the tin on tin cans is that a thick coating is applied and yet it often has as many as 1000 pinholes per square foot. Professor Fink's electroplating process applies a very thin coating with a mirror-like finish in which the pinholes are absent. Commercial production of the process is expected in 1937.