leads to a distance-distribution of nebulæ which is contrary to observation. It is, however, well known that the distances of nebulæ are in no sense 'observed': they are defined by means of theoretical formulæ in terms of the observed apparent magnitudes of the nebulæ. Moreover, the definitions vary with the process of distance-measurement envisaged. Dr. Hubble's statement is, therefore, only true if (a) we accept his particular definition of distance in terms of apparent photographic magnitude, and if (b) we also accept his identification of this distance with a certain one of the quantities figuring as 'distance' in the model universes of general relativity.

In a detailed investigation, to appear shortly in the *Zeitschrift für Astrophysik*, I have shown that, by retaining (a) and rejecting (b), all Dr. Hubble's observational formulæ are in complete accord with a hyperbolic space of infinite extent. His two alternatives, namely, that we must abandon either the homogeneity of the nebular distribution or the expansion of the universe in order to obtain a satisfactory interpretation of the data, do not, therefore, exhaust the possibilities. Both homogeneity and expansion may be retained provided that we modify Dr. Hubble's theory of 'distance'.

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A Cosmic Ray Burst at a Depth equivalent to 800 m. of Water

Under the above title we announced in Nature[1] the results of our measurements in a railway tunnel, in which we observed a burst of the size of about 10^7 ions at an equivalent depth of more than 800 m. of water. In the note, however, we regret to have made the following statement, which we should like here to withdraw :

"Both Kolhörster and Corlin[2] made measurements with an ionization chamber down to 800 m. water-equivalent underground. The cosmic ray intensity at this point was tentatively assumed to be zero. From the above results, however, we see that there still remains a very small part even at this depth."

The fact is that Kolhörster[2] published, contrary to our statement, the results of his underground measurements by means of the coincidence method, which is independent of any residual ionization.

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Sept. 24.

[1] Nishina Y. and Ishii C., Nature, **138**, 721 (1936).
[2] Kolhörster, W., *Sitz. Preuss. Ak. Wiss.*, **689** (1933) ; Nature, **132**, 407 (1933) ; *Z. Phys.*, **88**, 536 (1934). Corlin, A., Nature, **133**, 63 (1934) ; *Ann. Observatory Lund.*, No. 4, A, 95 (1934).

Points from Foregoing Letters

Prof. R. Goldschmidt describes two cases of spontaneous mutations in *Drosophila* cultures in which three well-known mutants, and possibly five, were produced by intra-chromosomal rearrangement. The observed mutations, the author states, do not agree with the theory postulating the existence of genes or gene mutations ; he would explain mutations as due to changes in the 'correct order' within the chromosome chain, without attaching particular characters to special regions of the chromosome.

A table and graph comparing the ionization produced in various gases by cosmic rays and by gamma rays from radium C, are submitted by J. Juilfs. The ionization is directly proportional to the density of the gases only in the case of the more penetrating cosmic rays, and this fact may serve to distinguish between such cosmic rays and the less penetrating gamma rays.

Two simple camera designs, for X-ray spectrum analysis, are described by W. F. de Jong, who points out a number of advantages resulting from the use of a cylindrical in place of a conical camera.

Using a thin (2 mm.) paraffin layer as 'scatterer' so as to obtain a beam of neutrons distributed more uniformly over the energy spectrum, C. Y. Chao and T. H. Wang have measured the induced radioactivity in silver, rhodium and bromine. Accepting certain approximate values for the cross-sections of their nuclei, the authors calculate the spacing of the resonance neutron levels in the nuclei of those three elements.

Changes in colour produced in a light-coloured dogfish by injection of pituitary extract are described in detail by D. R. Barry.

Dr. H. H. Pfeiffer discusses the possible nature of the forces acting on chromosomes during mitotic division, and states that in the case of the nucleus of mesenchyme cells of *Salamander* embryos, cultivated *in vitro*, distinct spindle fibres with positive double refraction arise through the action of a weak mechanical influence on the protoplasm.

Prof. C. Stern suggests a method by means of which it may be decided whether or not end products of genic reactions within the nucleus can exert an influence upon the cytoplasm prior to the breakdown of the nuclear membrane at mitosis.

B. Shapiro and Prof. E. Wertheimer state that, in the rat, excessive liver fat of nutritional origin can be removed by administration of alcoholic extract of pancreas. The treatment does not lessen the body fat, does not increase the acetone body excretion in the urine and does not change the quantity of fat or sugar in the blood. No antagonism between liver fat and liver glycogen was found in these experiments. The effective principle seems to be specific to pancreas.

Further experiments by Dr. B. Mendel and Miss F. Strelitz show that potassium ferricyanide, which stops the transformation of glucose into lactic acid (glycolysis) in the presence of air by tumours, does not prevent this process from taking place in kidneys ; the inhibitive effect of the ferricyanide appears to be specific for tumours.

A number of ethylene derivatives have been tested for œstrogenic activity by Prof. E. C. Dodds, M. E. H. Fitzgerald and W. Lawson. In addition to stilbene and triphenyl ethylene, diphenyl-butadiene has been found to affect the mating instincts of rats from which the ovaries had been removed.

Dr. G. C. McVittie points out that the distribution of spiral nebulæ can be interpreted in terms of hyperbolic space provided that some modifications are made in Dr. Hubble's theory of distance.