

the holes can constitute a condensed phase. For the hole-model of a liquid it is of great importance to construct formally the Schrödinger equation and determine the eigenvalues for its energy. The energy levels are found to be discrete, and the theory gives expressions for melting point and latent heat of fusion in terms of the surface tension of the liquids. It is tempting to observe that the energy levels of a hole may reveal their presence in scattering and ultrasonic phenomena.

After describing some properties of black-body radiation and the transformation of matter into radiation, the properties and astrophysical applications of degenerate matter are dealt with. Degenerate matter is material which is composed of ionised atoms, the free electrons constituting a degenerate gas in the sense of Fermi-Dirac statistics. The question arises 'how and under what conditions atoms become ionized and generate a gas of free electrons?' There are two ways in which atoms become ionized: (1) Temperature ionization and (2) Pressure ionization.

The theory of temperature or thermal ionization was given by Saha about twenty years ago and, if the value of discovery is to be judged by the fruitfulness of its consequences, the discovery of Saha should be regarded as one of the most important in modern physics. In thermal ionization temperature plays a denominating role and pressure and density only a secondary part. In degenerate matter on the other hand the ionization is essentially

controlled by the density or pressure—in degeneracy, pressure depends mainly on the density of the material and very little on the temperature.

The theory of pressure ionization finds its most interesting application in explaining the mass-radius relation for white dwarfs and planets. In deriving the mass-radius relation the effect of the electrical field existing inside the configuration is taken into account. The theory predicts that in the white dwarfs stellar material must be completely ionized. In the usual white dwarf theory it is taken as an assumption here it follows naturally from the theory. In the case of planetary masses the degree of ionization depends on the mass and decreases rapidly with falling mass.

It is interesting to observe that for the newly discovered planet (mass $0.016\odot$) of the star 61 Cygni, the theory gives a radius of 3×10^9 centimetres if we assume it to be composed entirely of helium. For hydrogen the radius is three times larger.

Perhaps the most significant prediction of the theory is that there cannot be a cold body (planet or white dwarf) appreciably larger in size than Jupiter.

The relativistic modification of the mass-radius relation is also discussed and the treatment given by Kothari is in some respects different from the usual one. The problem of energy generation in white dwarf stars and the question of existence of hydrogen inside them is discussed at length.

TRUTH IN ANTHROPOLOGY*

THERE is very great need of a high standard of Truth in all our field work in Anthropology for anthropology is regarded with some suspicion in India. The attempt of certain scholars and politicians to classify the aboriginal tribes as non-Hindu created the reasonable impression that the science was being diverted to political and communal ends; the animism of the aboriginals belongs to the Hindu family obviously. But the chief thing that disturbed nationalist opinion in India was the creation of the Excluded and Partially Excluded Areas on the move made by a distinguished anthropologist. This arrangement has failed to give the tribes the liberty and protection they want and is to be condemned scientifically. Further, most of the published books on Social Anthropology do injustice by writing in a ridiculous strain about India. Really India's aboriginal population is splendid, verile, honest and kindly and is admirable and worthy of preservation. The publications of the Functional School show that these primitive communities are admirable and lovable. The Ethnographical Survey publications were, however, too bureaucratic, superficial and scrappy, while the Census of India published inaccurate notes on curiosities. Both of these depended on information provided by clerks and other untrained persons; the mono-

graphs of the Ethnographic Survey had numerous repetitions. This is the reason why India is almost neglected in the general works on Anthropology, which reproduce the opinions of irresponsible writers with political respectability.

In the interests of truth in anthropology, several things may be emphasised. The investigator should spend several years among the people he studies, knowing their language, and putting himself in sympathy with them. This would be easier for Indian enquirers. He should be 'a detective and a magistrate', for the tribes generally conceal many real facts and motives, or professional informants are unreliable and desirous of publicity more than truth. Negative replies are to be suspected, and conclusions should be firmly based on statistics. The evidence of tribal poetry, folksong, story, proverb and riddle is valuable. The publications also should be well printed and illustrated and expert help should be taken in these matters. Very few Indian words should be given in the text and where given, diacritical marks should be avoided as far as possible. Art and poetry are the sisters of science, in the great family of Truth.

A whole world of Indian life and culture is passing away without proper record and it is high time that we do our field work properly with reference to Truth. But the Truth of science is no static thing, for the scholar passes from truth to truth towards Eternal Truth in which he will find immortality. M. H. K.

* Summary of the Presidential Address delivered by Mr. Verrier Elwin, M.A. (Oxon.), F.R.A.I., F.N.I., before the Anthropology Section of the Indian Science Congress held at Delhi last January.