detailed account of the results obtained hitherto, along with an explanation of the processes involved in the emission of the enhanced spectrum, will be published shortly.   L. A. RAMDAS.

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            February 19.

Heterogeneous Catalysis.

IN connexion with prevailing notions on heterogeneous catalysis, the following remarks of Graham, written in 1868 (Proc. Roy. Soc., 16, 422, 1868 ; " Chemical and Physical Researches," 1876, p. 286), would seem to be of interest.   Referring to the adsorption of hydrogen by platinum, he says : " The hydrogen appears to be polarised, and to have its attraction for oxygen greatly heightened.   I beg to offer the following representation of this phenomenon, with an apology for the purely speculative character of the explanation.   The gaseous molecule of hydrogen being assumed to be an association of two atoms, a hydride of hydrogen, it would follow that it is the attraction of platinum for the negative or chlorylous atom of the hydrogen molecule which attaches the latter to the metal.   The tendency, imperfectly satisfied, is to the formation of a hydride of platinum. The hydrogen molecule is accordingly polarised, *orienté*, with its positive or basylous side turned outwards, and having its affinity for oxygen greatly enlivened.   It is true that the two atoms of a molecule of hydrogen are considered to be inseparable ; but this may not be inconsistent with the replacement of such hydrogen atoms as are withdrawn, on combining with oxygen, by other hydrogen atoms from the adjoining molecules.   It is only necessary to suppose that a pair of contiguous hydrogen molecules act together upon a single molecule of the external oxygen.   They would form water, and still leave a pair of atoms, or a single molecule of hydrogen, attached to the platinum."   (The formula of water is evidently considered to be HO.)

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Influence of Radiation on Ionisation Equilibrium.

IN a recent letter (NATURE, March 14, p. 377) Saha and Swe develop the theory of the stationary state of a medium traversed by radiation of a temperature different from that belonging to the medium.   Their argument seems to follow thermodynamic lines ; supposing this to be the case, it may be of interest to point out how the same results may be obtained starting from Einstein's classical paper on Planck's radiation law (*Phys. Zeit.*, 18, p. 121, 1917) and from Milne's extension to the photo-electric effect (*Phil. Mag.*, 47, p. 209).   The principle of this alternative method, already well known (Milne in this way recently has derived a formula equivalent to formula (3) of Saha and Swe, in his investigation of the equilibrium of a Ca^+ chromosphere, Mon. Not. R.A.S. 85, p. 119), consists in formulating the conditions required for a stationary state by means of probability laws governing the elementary processes involved. These probability laws themselves have been derived from the consideration that in thermodynamic equilibrium the number of elementary processes in one direction ought to balance the number occurring in the opposite direction.

For example, consider a gas traversed by radiation of a different temperature.   Milne's results allow us to compute the ratio of the number of photo-electric

ionisations to the number of electron-captures accompanied by emission of radiation, in terms of the relative concentration of neutral and ionised atoms. Requiring this ratio to be equal to unity furnishes a value for the degree of ionisation identical with formula (4) of Saha and Swe.

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Bushmen Rock Figures.

THE comparisons made by Prof. Dart (NATURE, March 21, p. 425) between Bushman paintings and Asiatic figures will need much wider knowledge than we at present have on our side.   The turn-over cap called " Phrygian " belonged to Phœnicians of Tyre and Sidon, and to men of Dabig between the Euphrates and Gulf of Alexandretta (see " Gates of Balawat "). It is seen about the Mediterranean now, and is much like the cap of the London draymen fifty years ago.   The cap with the long tail is not only Babylonian, but is the typical head-dress of the Hittite and Syrian god Sutekh.   Both of these forms may have a much wider spread, and the Bushman might have been figuring a liripipe hood of five centuries ago.

The Figure 13, quoted as Egyptian, is a man of Punt. The " figurino of an Egyptian courtier of the period of Thothmes III." I have handled.   It is a well-known kind of moulded pottery figure, from Thebes, but more probably modern than ancient.   There is, no doubt, a wide basis of African custom and culture below Egyptian civilisation, of which I have quoted dozens of examples, in *Ancient Egypt*, 1914, pp. 115, 159, and the indications are that these are due to a common basis, and not to importation from Egypt.   General likenesses to Egyptian figures do not strike those who know them best; the women of Fig. 12 might be Somalis, but not Egyptians.   Resemblances of names require an exhaustive inquiry as to possible meanings and origins among all the languages that may have intervened, before they can be accepted with caution. A name always means something ; it is not a casual sound.   FLINDERS PETRIE.

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On the Resonance Radiation from Thallium Vapour.

RECENTLY we have shown that the absorption spectrum of non-luminous thallium vapour exhibits lines corresponding to the sharp and the diffuse series, and that $1\pi_2$ is the ground orbit of the valence electron in the atom of this element.   A further confirmation of this view is given by our latest experiments on resonance radiation.   In these experiments the radiation emitted from the vapour in a lateral direction was examined when the vapour was illuminated with light obtained by using different colour-screens.   It has been found that the vapour, subjected to radiation $\lambda 5350$ ($1\pi_1 - 1\sigma$), does not emit any radiation, while when illuminated by radiation $\lambda 3775$ ($1\pi_2 - 1\sigma$) it acquires the ability of emitting radiations $\lambda\lambda 5350$ and 3775, the fluorescent track in this latter case being of a beautiful green colour.   These experiments, together with the experiments on absorption, strikingly confirm that $1\pi_2$ is the normal state of the atom. Further experiments in this direction are in progress.

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