With disks of 8 cm. diameter and 1 cm. thickness, made from 'magnuminium', a magnesium alloy of high specific tensile strength, the breaking speed of 1,500 rev./sec. was unchanged by a 1 mm. axial hole. With rotors shaped so as to have nearly uniform stresses throughout, the presence of a hole lowered the breaking speed about 10 per cent, or the strength 20 per cent. Unluckily for our purpose, a radial hole reduces the strength to less than half. In these experiments peripheral speeds as high as 700 metres per second were recorded.

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[1] J. C. Maxwell, "Collected Papers".
[2] A. Stodola, "Dampf und Gasturbinen", Sixth Edit. Timoshenko and Lessels, "Applied Elasticity". J. Prescott, "Applied Elasticity".
[3] J. W. Beams and E. G. Pickels, *Rev. of Sci. Inst.* (U.S.A.), Oct. 1935.

Origin of Levirate in Assam

RECENT investigation *in situ* among the different tribes of Assam has led me to think that the hitherto accepted theories on the origin of levirate seem to be untenable in this area. This institution varies so widely from area to area, and the theories propounded so far being based on materials from different countries, that a separate explanation for Assam is needed.

Of the two types of levirate, the junior and the senior, the former is by far the more widely prevalent in Assam, though among some of the Old Kukis groups, for example, Aimols, Mantaks, Anals, etc., both types are still in vogue. But as the tribes are coming in contact with the people of superior culture who dislike this custom, it is losing its force. For example, the Wainems having long been influenced by the Meitheis, who have discarded this practice, do not look upon this type of union with favour. Amongst them the senior levirate is absolutely forbidden. The junior levirate also, though found in exceptional cases, is not looked upon with favour. The Chiru Kukis, who are coming in contact with the Meitheis, have already deviated from some of their social customs and also forbid senior levirate; though junior levirate is still to be found amongst them. The other branches of the Old Kukis, who are far away from civilisation and have very rarely come in contact with peoples of superior culture, do not embrace these tenets and they still practise both types of levirate.

The avoidance of senior levirate in this area has sometimes resulted from a dislike for polygyny amongst the people. The elder brother having generally married before the younger, he cannot take the younger brother's widow without having a plurality of wives. The younger brother who is not married, however, weds the deceased brother's wife. For this reason this type of union is more common. In this area, economic factors also play a very important role.

The high bride-price and service in the house of the future father-in-law for several years put a great hardship on the people, and they always try to get round this custom. In some tribes, we find that the rich men are trying to substitute payment for service. Poor men cannot have recourse to this alternative; but by accepting the hand of the deceased brother's widow, they can avoid this service, and so amongst them it is more common. Moreover, the property of the deceased brother comes into the possession of the man marrying the widow, who in a sense has been earned by payment and service. Thus the combination of both economic and social factors tends to the widespread prevalence of this institution in Assam.

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Simple Relations between Vibrational Frequencies of Isotopic Molecules

THE following relations may be useful in discussions of the isotopic effect in Raman spectra. Let ν_i' and ν_i'' be corresponding frequencies of the isotopic molecules, m_a' and m_a'' the masses of the isotopic atoms and A_{ab} the constants of the vibrational potential energy; then

$$(2\pi)^2 \sum_i (\nu_i'^2 - \nu_i''^2) = \sum_a \left(\frac{1}{m_a'} - \frac{1}{m_a''}\right) A_{aa};$$

$$(2\pi)^4 \sum_i (\nu_i'^4 - \nu_i''^4) = \sum_{ab} \left(\frac{1}{m_a' m_b'} - \frac{1}{m_a'' m_b''}\right) A_{ab}.$$

Similar equations hold for the 6th, 8th and following powers of the frequencies. The equations may be applied to each symmetry class separately, if symmetry co-ordinates are suitably chosen.

Applications of these equations, especially with regard to the problem of benzene, will be discussed elsewhere.

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Karl Pearson

MR. G. UDNY YULE'S interesting obituary of Karl Pearson (NATURE, May 23, p. 856) does not offer "the meed of some melodious tear" to his efforts for the creation of a great University of London. "K. P." collected his ephemeral contributions on this question in a small book, "The New University of London" (Fisher Unwin, 1892). Appendix C (p. 130) deals exhaustively with the contributions of Sir Thistleton Dyer and Sir Ray Lankester to NATURE of May and June 1891; but "K. P." himself does not appear to have used this journal for his polemics. Unlike Huxley, he was as regards the colleges an 'absorptionist', his somewhat naïve idea being that absorption would prevent domination. For the vigour of its dialectic, this little book is a delight.

Although at variance on a question of fundamental policy, "K. P." acknowledged—and this is characteristic of the man—"that Huxley's leadership did at any rate a great deal to unite the London teachers and raise their ideal of a true university, while at the same time helping to repress the self-interests of many persons and institutions which had been before very much to the front" ("Life and Letters of Thomas Henry Huxley", vol. 2, p. 314)

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