(n group number) tends to constancy, within experimental errors, for ground states of simple di-atoms of related type (for example, LiLi, NN and OO).

Using the relation $k_e r_e^2 = pD$ (k_e bond constant, p a constant product for di-atoms of related type[2]), it follows that $k_e r_e^5 n^{1/2} = px$. Fox and Martin[3] find $k_e r_e^5$ constant for C—C linkages: further examination shows that it also connects ground and excited states of the di-atom CC. In general, however, $k_e r_e^6$ seems more useful for correlating different states of a given di-atom, and this is suggested by the Morse-Clark function, which leads to $k_e r_e^6 n = py$, where $y = Dr_e^4 n$, for cases where the reduced mass does not vary greatly. This relation between k_e and r_e is essentially that already used with some success for hydrides and deuterides[4], and conforms with a suggestion made by Sutherland[5], to meet a well-known difficulty which appears in the Morse-Clark expression in the case of isotopic forms. The function y is closely constant in the KH period, where the reduced masses are nearly alike. For HH, HD and DD, x and y give equally concordant results.

Whilst x (or y) appear sensibly constant in appropriate periods, p is more susceptible to change in electron configuration: thus in ground states p(LiLi,KKss) = 9·9, p(OO,KKpp) = 20·9, while x = 30·7 volt A.[3] very nearly in both cases. Fox and Martin[3], in agreement with this, find p = 20·7 for C—C linkages (KKpp type). However, for a given configuration in a given period of di-atoms, p varies with x (or y) in such a way that px (or py) is sensibly constant for excited as well as ground states, and may be equated to period constants of the type K_{qr}.

It is hoped that reliable and more general relations connecting D, k_e and r_e may emerge from this. The detailed results of calculation will be submitted for publication elsewhere.

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Differential Threshold for Compression Modulus

WE have recently described[1] experiments in which it was shown that individuals differed but slightly in their capacity to distinguish by touch small differences in viscosity of highly viscous true fluids, and that an 80 per cent level of correct judgments corresponds to a viscosity difference of about 30 per cent.

We have now carried out similar experiments with rubber cylinders in which the compression modulus varied slightly*, the subjects being asked, as in the viscosity experiment, to select the 'softer' of two samples. For the rubber cylinders there are significant differences between individuals (χ^2 method) and further, those of our subjects regularly engaged in routine testing are superior as a group. Less educated and younger subjects are also superior, but it has not been possible to distinguish the separate effects of education and age.

Taking the results for all ten subjects together, our data may be summarized as follows:

	Pairs differing in compression modulus by: per cent (means)					
	1·47	2·74	5·56	9·59	10·59	12·62
Per cent correct	35	49	72	81	85	90
„ given as equal	25	20	11	11	5	2
„ given in reverse order	40	31	17	8	10	8

It will be seen that an 80 per cent level of correct judgments corresponds to a modulus difference of about 9 per cent, so that we conclude that differences in compression moduli of approximately solid materials can be judged subjectively about three times as accurately as can differences in viscosities of highly viscous fluids.

Details will be published elsewhere.

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* The cylinders were manufactured for us by the Research Association of British Rubber Manufacturers.

[1] NATURE, 143, 164 (1939).

Vanadiferous Nodules in Worcester Clay

THE presence of dark nodules in the red Permian marls of South Devon has been recorded[1]. These nodules, which range from pin points to masses of many pounds in weight, attain their maximum development one mile west of Budleigh Salterton. They are surrounded by aureoles of green clay, contain some 14 per cent of vanadium (estimated as V_2O_5) and are radioactive.

We have found analogous structures in the Keuper marls of Gregory's Bank, Worcester. They are mostly very small and, *in section*, consist usually of a black centre ranging from a pin point to 0·8 cm. diameter, the larger ones with a greyish centre and surrounded by a disk of green clay 1–2 cm. in diameter, the perimeter of which is sharply defined against the general background of red clay. The largest nodule found weighed 8 gm. and was egg-shaped. Strata of green clay also occur in the Bank and contain numerous small black inclusions.

The green aureole contains ferrous iron and, as its spectrogram appears identical with that of the adjacent red clay, it seems reasonable to conclude that it has been formed from the latter by reduction or removal of the ferric iron; but it is not clear how this has been effected. The black and grey centres contain some 5·6 and 8·6 per cent respectively of vanadium (calculated as V_2O_5), with traces of titanium; but no nickel could be detected. Any radioactivity must be extremely weak as a photographic plate was not appreciably affected after one month of direct contact.

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