should confine ourselves to the numerical k's and μ's of material media.

The omission of k_0 and μ_0 produces startling simplicity; the C.G.S. unit charge and unit pole both become 1 dyne$^{\frac{1}{2}}$ cm., the electrostatic unit of capacity becomes 1 cm., instead of 1 k_0 cm., and so on. Incidentally, I suggest that this method of indicating the dimensions of a physical quantity by giving one of the units commonly employed in measuring it has some advantages. The velocity of light in space, as the electromagnetic constant, c, comes naturally into all the equations connecting electrical and magnetic quantities—for example, the work done in taking a pole m round a closed path linking once with a current i is $4\pi mi/c$—instead of being hidden away as $1/k_0{}^{\frac{1}{2}}\mu_0{}^{\frac{1}{2}}$.

This way of regarding electrical dimensions appears to me to be much better than the μ_0 k_0 method and it is tacitly approved by all physicists who give capacities in centimetres instead of in k_0 cm. So far, however, I have only seen it formally adopted by German physicists.

As the writers of the letters quoted above have pointed out, fractional indices may be avoided by employing a unit of electricity as one of our fundamental units and writing, for dyne$^{\frac{1}{2}}$, C.G.S. unit charge per cm.

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[1] NATURE, **130**, 368, Sept. 3, 1932.
[2] NATURE, **130**, 892, Dec. 10, 1932.

Catalytic Hydrogenation of Olefinic Compounds

IN a recent paper[1] it has been shown that the course of catalytic hydrogenation in a series of butadiene acids $R_1R_2C{:}CR_3.CR_4{:}CR_5.CO_2H$ varies from member to member when the operation is carried out with a platinum catalyst at room temperature and atmospheric pressure. More recent work shows that the figures then recorded for the proportions of the components of the reduction mixture at the stage of 50 per cent hydrogenation are by no means to be regarded as characteristic of the respective acids, since by using an 'aged' catalyst the course of hydrogenation of sorbic acid, $CH_3.CH{:}CH.CH{:}CH.CO_2H$, follows a course which is considerably different from that previously observed. Both the original and the new observations can be readily repeated.

The condition of the catalyst thus materially affects the relative extents to which αβγδ-tetrahydrogenation and αβ-, αδ- and γδ-dihydrogenation occur simultaneously; consequently the nature and extent of substitution in the butadiene chains is not, under the conditions employed, the sole or apparently the most important influence in determining the course of reaction. The substitutional or constitutive influence (activating or deactivating) appears to be superimposed on a specific catalytic influence which of itself can activate both unsaturated centres of the conjugated system simultaneously.

Definite conclusions were reached several years ago by Lebedev and his collaborators[2] with respect to the order of reducibility (in competition) of (*a*) mono-, di-, tri- and tetra-substituted olefinic substances and (*b*) olefinic and conjugated di-olefinic substances. These conclusions, which were based largely on the form of the hydrogen-absorption curves (rate/time) for binary mixtures of mono- and di-olefinic substances, have now been rigidly verified, so far as numerous binary mixtures of Δ^{α}-, Δ^{β}- and Δ^{γ}-hexenoic acids, Δ^{γ}-pentenoic acid, allyl alcohol and sorbic acid are concerned, by chemical analyses of partial reduction products. Thus in the hydrogenation of sorbic acid, the whole of the conjugated acid disappears before the three isomeric ethylenic acids produced in the reduction suffer attack; moreover it is easy to follow quantitatively the disappearance, which proceeds at a constant rate, of the conjugated acid and the corresponding appearance of its saturated and ethylenic derivatives.

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[1] Farmer and Galley, *J. Chem. Soc.*, 430; 1932.
[2] Lebedev, Kobliansky and Yakubchik, *J. Chem. Soc.*, 417; 1925. Lebedev and Yakubchik, *J. Chem. Soc.*, 832, 2192; 1928.

Rate of Burning of Colloidal Propellants

IN a paper[1] recently published by F. R. W. Hunt and G. H. Hinds, use is made of physical data quoted by ourselves in a previous publication[2] dealing with the general problem of the combustion of colloidal propellants. They draw conclusions which are directly at variance with our own in the case of three out of the four propellant compositions considered, in that they deduce for the rate of burning a pressure law, as against the temperature-density law advanced by us.

In analysing the data they have adopted the hypothesis that a formula given by us[3], for assigning numerical values to the energy losses at the end of combustion, can when slightly generalised be applied to calculating the energy losses at any stage during the combustion. They have then proceeded to correct the pressure at each measured time interval, and in this way they have arrived at a hypothetical uncooled pressure-time curve (that is, the curve that would be presumed to have been obtained, had there been no energy loss at any instant during the explosion). From these values for uncooled pressure they have calculated corresponding fractions of charge burnt, and assuming no alteration in the time scale they have proceeded to apply a criterion to determine whether the rate of burning is proportional at any instant to their corrected uncooled pressure, or to their deduced gas density.

Such a procedure appears to be of doubtful validity. In the first place, the energy loss equation referred to was based on the assumption of a mean gas temperature holding throughout the burning, equivalent to that obtaining at the instant of complete combustion. This assumption was sufficient for the circumstances in which the formula was applied by us, namely, the assessment of the order of magnitude of a summation energy loss effect at the end of the explosion. A formula of this type, however, with an assumed average temperature and an appropriate fitting constant based on end conditions, cannot be used for assessing with sufficient accuracy varying temperature values during the burning for the purposes of any differential treatment, though it may yield values of approximately the right order of magnitude.