

the trifles which may decide events. The scientific net can scarcely be cast too wide.

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THE appearance of the leading article in NATURE of May 6 is extremely opportune. The question is one in which the scientific world is seriously concerned, and the possibility of the high cost of production stifling the progress of science must lead us to consider what means can be found to obviate so disastrous a calamity. It is unnecessary to quote evidence of the enormous increase in the cost of printing and publication at the present time—that is well known—but the question is accentuated by many indications that the cost will go higher in the near future.

It is very undesirable that such increased charge upon the funds of scientific societies should be met by raising subscriptions. No deterrent to join societies should be advocated, for science is advanced more by individuals than by the extent of their published papers.

The question turns upon the limitations which the present state of affairs must exercise upon publications. It is quite certain that some curtailment is necessary to avoid insolvency. It is patent to all that many papers are characterised by diffuseness and redundancy, as if the value of a paper was to be judged by its length. No one who wishes to keep *au fait* with current work has time to read such—conciseness and economy of expression in the treatment of scientific papers are the desiderata.

During the war we were rationed in our food for the body, with good rather than harm to ourselves. It is now necessary that the food for our minds should be rationed. The only possible way to carry on until things are easier is to limit publication to condensation or abstracts of papers, except in special cases. It is not an easy task to make abstracts of papers so as to retain all that is essential, and with some writers it is extremely difficult to condense their diffuse communications. The point might be met by putting the responsibility upon authors and limiting them to a definite number of pages, according to the character of the paper.

Let me give an instance where curtailment in publication has resulted in great economy without loss. A few years ago the volume of Greenwich Observations extended to as many as 1400 pages. The Board of Visitors decided that it was not necessary to publish a considerable mass of observations, as these could always be supplied from the Royal Observatory to anyone who wanted them, and by this means the volume was at once cut down to less than 600 pages.

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THE leading article in NATURE of May 6 comes home to those of us who are concerned in carrying on the work of scientific societies. We are making laborious efforts to prune down diffuse contributions, and also endeavouring to increase our income by attracting new members. Many of us regard an increase in subscription rates as a device only to be contemplated as a last resort, and are in complete agreement with your article.

The Royal Meteorological Society is directly concerned with the question of accommodation, as well as of increasing costs of publication, and we should welcome any possibility of joining the privileged societies that are housed by Government. Failing a cash subvention for the one purpose, is it possible to

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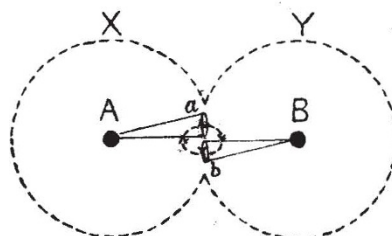
urge the Government to do something for us in the other direction? I should like to press for the removal of the Civil Service Commission from Burlington Gardens. Examinations might well be held in university rooms at South Kensington or elsewhere. I do not know how many societies could find adequate room in the building if it were thus set free; but it seems to me that assistance of this kind would be, at any rate for those of us who secured it, better than a subvention towards printing expenses, and possibly easier to obtain from the Government.

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Atomic and Molecular Forces and Crystal Structure.

ONE of the most difficult problems in the theory of chemical valency is to form a clear picture of the attractive forces between *similar* atoms. Lewis and Langmuir, in their theory of the cubical atom, have each attributed the single valency bond to the mutual action between a pair of electrons, and Langmuir has recently pointed out (NATURE, April 29, p. 261) that, as regards chemical considerations, such a pair of electrons may be regarded as revolving in the same orbit. This idea is closely allied to Bohr's construction for the hydrogen molecule. It should, however, be pointed out that such a construction leads to a strong paramagnetic property for molecular hydrogen, unless the electron motions are compensated by rotation of the nuclear charges. Such compensation is scarcely likely, since the magnetic moment depends on the area of the orbit described, and evidence up to date points to a nuclear radius of small order compared with that of the electron orbit, even though the latter be small compared with the conventional radius of the atom.



Model of hydrogen molecule.

Suppose X and Y are two exactly similar hydrogen atoms. Their nuclei are shown at A and B, and the negative electron orbits at a and b. The nucleus A may control the orbit a electrostatically and magnetically, while B controls b. As shown, there will be magnetic attraction between a and b, and possibly also a certain amount of electrostatic repulsion if each electron is not completely bound to its own nucleus. Equilibrium may be established for some such disposition of the charges as that indicated. We thus get a sort of fusion of the two hydrogen atoms which corresponds to the fusion of the electron orbits in Bohr's theory of the hydrogen molecule. In the present case, however, the fusion is controlled magnetically, whereas in Bohr's theory it is purely electrostatic.

The system depicted above gives a diamagnetic hydrogen molecule as required.

With more complicated systems, we can see, in a general way, how the small circular orbits will dispose themselves in pairs (Lewis and Langmuir) primarily under their mutual magnetic influences.