

not so perfect as it is for the previous systems, but the bands are very diffuse and are difficult to measure. We have also experimented upon the conditions under which these bands are developed, and since they are eliminated by additions of small quantities of alkali metals to the vapours, and are enhanced by additions of oxygen, we conclude that they may arise from an association of cadmium and oxygen. From experiments now in progress, however, we suspect that they may be totally unconnected with cadmium, and that another and unidentified impurity is responsible for them.

We hope that a complete account of these and other experiments will shortly appear elsewhere. It is, unfortunately, not possible to include a wave-length comparison in this letter, for reasons of space; but it may be stated that the agreement is so good that there can be no doubt of the identity of the spectra.

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Oct. 12.

Contractions for Titles of Periodicals.

OWING to absence from London I have only now seen Mr. Gomme's letter in NATURE of Sept. 22. I believe that among experts there is fuller agreement than either Mr. Gomme or the compilers of the "World List" would seem to admit on some of the rules which should govern the abbreviations of titles of scientific periodicals. Few, I think, would dispute the rules (a) that in an abbreviated title the abbreviations should follow the same order as the corresponding words in the full title of a journal as it appears on title-page or cover; and (b) that in a system of abbreviations the same contraction should not be called on to do duty for words of entirely different meaning. In my letter to NATURE of Aug. 25 I gave examples of what appeared to me to be infringements in the "World List" of both these rules.

Mr. Gomme seems to regard these infringements as unimportant so long as a searcher is able to consult at first hand the "World List," and has familiarised himself with its admitted vagaries, and possesses also a good knowledge of the titles of scientific periodicals to help him out in obscure cases. In thus advocating the "World List," Mr. Gomme overlooks the fact that when one is considering the universal adoption of a system of abbreviations for titles, regard must, in the first instance, be had to the requirements of scientific readers of all nationalities, of whom few will have ready access to the "World List," and still fewer will enjoy facilities that are at the command of a librarian of a large institution. To such readers the observance of the rules set out above, and of others which I have indicated in my letter of Aug. 25, is, I think, important. In their interest I would urge the soundness of yet another rule, laid down some years ago at the conference held in connexion with the International Catalogue of Scientific Literature, that abbreviated titles must be intelligible without a key.

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The Contraction of Pachyphase Chromosomes in *Lilium*.

IN the pachyphase of *Lilium pardalinum*, in specimens fixed with chromic-acetic-formaldehyde, and stained with iron-brazilin, there were estimated to be 2193 chromomeres, each usually consisting of two pairs of chromioles. The average diameter of the chromioles was estimated at 0.23 micron, and the

average distance between the centres of neighbouring chromomeres was calculated as 0.67 micron. Hence it could be deduced that an approximation of the chromomeres until they were in close contact would decrease the total length of the bivalents from 1469 microns at pachyphase to 504 microns (at diaphase). But in *Lilium longiflorum*, the maturation divisions of which closely resemble those of *L. pardalinum*, the total length of the twelve bivalents at late diaphase and at metaphase (and also the total length of twelve of the split anaphase chromosomes) was only about 150 microns.

This remaining contraction, to less than one-third of the minimum size which could be attained by approximation of the chromomeres, was presumed to be probably brought about by zigzagging of the chromonema, or chain of chromomeres. Since the volume of chromatin was shown by measurements to increase to about ten times its bulk between pachyphase and metaphase, this zigzagging was not directly visible; but it was indicated by the corrugation of the chromosomes at all stages from late diaphase to first anaphase. The total contraction in length, from pachyphase to first metaphase, was found to be about the same in *Aloe purpurascens* as in *Lilium*.

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The Depth of Field and Resolving Power of Optical Instruments.

IN his letter in NATURE of Oct. 27, Mr. T. Smith repeats in a slightly different form the matter contained in my letter in the issue of Oct. 13. If the wave-length were infinitesimal the geometric theory would be correct. With a finite wave-length it 'pays,' so far as definition is concerned, to reduce the lens aperture until the 'spurious disc' and the 'circle' of confusion due to part of the image being out of focus are of the same order. Airy's work relating to the 'spurious disc' is contained in a paper entitled "On the Intensity of Light in the Neighbourhood of a Caustic." This I read in 1871. In reference to the same subject, the late Lord Rayleigh quotes Verdet's "Leçons d'optique." This I have not seen.

Mr. Beck states (p. 650) that 'etched' lines at 140,000 to the inch have been resolved and seen by the eye. If the lines are etched it is certain that the surface is not flat, but grooved, and no doubt the depth of the grooves is sufficient to alter the length of the wave path enough to effect resolution.

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Salmon and Sea Trout Synonyms.

MY attention has been directed to your comments, on page 547 of NATURE of Oct. 6, on my collection of local and general names applied to salmon and sea trout. The article to which reference is made was merely an attempt in the first place to clear up some of the superfluities of popular nomenclature and local idiosyncrasy, which you rightly condemn; and secondly, to collate and preserve them in the interests of philology. Whilst admitting that the list would have been much increased in value had the area in which each name is used been indicated, it is regretted that this would not be feasible, owing to the fact that many of the terms are used in the same sense throughout the country.

ALBERT WADE.