Campanula rotundi-					
folia	July 8, 1893;	July 2–15, 1887–92			
Calluna Erica... ...	,, 22, ,,	,,	19,	1887	
Jasione montana ...	,, 1, ,,	,,	2,	1892	
Cnicus arvensis ...	,, 1, ,,	,,	2,	1889	
Scabiosa succisa ...	,, 22, ,,	,,	23,	,,	
Galeopsis Tetrahit ...	,, 15, ,,	,,	16,	1892	

The general result is, then, that the season was three weeks early in March, but that by the first of April the advance had increased to four weeks ; this was maintained through most of the month, but May day was only some three weeks in advance ; the fall continued slowly through May and June with an average advance of a fortnight. In July, however, the effects of the early spring had ceased to have any effect. These conclusions are more likely to err on the side of moderation, for it must be remembered that the flowering time this year has been contrasted not with the average, but with the earliest record of previous years.　　　　　　　　　　　　W. B. CRUMP.

Mr. Love's Treatise on Elasticity.

THE second volume of Mr. Love's treatise will doubtless be reviewed in NATURE in due course ; but in the meantime I desire to make some observations upon certain criticisms, which this work contains, on my own papers on thin elastic shells, plates, and wires.

The theory of thin plates, and shells in the form given by Mr. Love, is based upon those of Kirchhoff, Saint-Venant and Clebsch. All these theories are incomplete and defective, and depend upon certain assumptions and approximations which have been called in question, and are by no means free from difficulty. An attempt has been made—see pp. 92 and 207—to remove these objections by classifying the different cases which arise, but whatever may be thought of the success of this explanation, it requires the reader to wade through a long and complicated analytical investigation before he is in a position to apply the theory.

On the other hand, the method of expansion originally employed by Poisson, and afterwards by myself, coupled with the hypothesis that the stresses R, S, T may be *treated* as zero, is one of great power, and, as I showed a few years ago, enables an approximate theory to be *completely* worked out as far as terms involving the cube of the thickness of the plate or shell, and Mr. Love is forced to admit on p. 236 that his own theory is incapable of doing this. It is true that Clebsch and Saint-Venant have raised objections against the method of expansion which I cannot regard otherwise than as frivolous ones ; but although an account of the first class of theories is no doubt desirable, it is much to be regretted that Mr. Love has allowed his bias against the second class of theories to lead him to adopt a mode of treatment which greatly increases the difficulties of the subject, is less perfect, and which, I fear, will retard its further progress by throwing unnecessary obstacles in the way of students.

On pp. 238 and 262, Mr. Love imagines that he has detected an error in my own work as regards the values of T_1, T_2 (in his notation P_1, P_2), but this conclusion is not warranted. His investigation in § 353 expressly supposes the vibrations to be non-extensional, whereas in the investigation by which I have calculated, T_1, T_2 by means of the variational equation, extension is expressly supposed to take place. If it were desired to calculate the values of T_1, T_2 by the variational method in the case of inextensibility, it would be necessary to start with the corresponding form of the potential energy, and to take account of the fact that δu, δv, δw are not independent, either by means of indeterminate multipliers or by elimination. The two cases are therefore not parallel, and the so-called test is nugatory. If a direct test were desired, it could be supplied by means of the theory of the radial vibrations of a cylinder worked out to a second approximation.

The only other point to be noticed is that in the case of a bent wire the values of the three couples given by Mr. Love on p. 169 disagree with those obtained by myself. Mr. Love *assumes* these couples to be respectively proportional to the changes of curvature and twist, and he then proceeds to calculate the latter quantities in terms of the displacements by a method which leaves nothing to be desired as regards elegance and conciseness and comprehensiveness. But he can scarcely be said to have given anything which can be called a proof that these couples are *actually* proportional to the above-mentioned

quantities ; and a new and independent investigation is much to be desired.　　　　　　　　　　　　A. B. BASSET.

Hotel de Russie, Bad-Ems, Nassau, Germany, August 23.

An Appeal to Mathematicians.

SINCE I have commenced the study of the "Ramayana" (the great Sanskrit epic) in original Sanskrit, and its translations, epitomes, and commentaries by renowned European scholars, I have been struck with the inadequacy the western scholars of Indian chronology have shown in fixing the date of Rama.

I cannot but admire the method used by our modern Egyptologists in computing the dates of Egyptian chronology, and correcting the discoveries of some of the earlier researches in that interesting branch of knowledge. Having discovered it written in some old MSS. that in the reign of a certain king some remarkable comet or eclipse was observed, or a building was erected pointing to a certain star in the heavens, which has since changed position, &c., &c., our scholars have obtained sufficient data to compute with tolerable correctness a more or less trustworthy date for that king.

There is no doubt that such refined discoveries could never have been made if this branch of knowledge were left alone with simple historians or simple chronologists—I mean, no light would have been thrown over the pages of the dark history of Egypt had not astronomical methods been employed to solve the vital questions of Egyptian history.

I am very much grieved to see that the chronology of India has not at all been touched by any scientific investigator whose conclusions could be relied on, though Indian chronology is now proving to be far more interesting than the chronology of any other country or nation of the world. India has now the honour of being under the benign rule of the British nation, so forward in scientific matters ; then does it not give grief to the lover of India to see this important branch of past history so much being neglected ?

The second half of the eighteenth century and the first quarter of this nineteenth century had seen a few benefactors of India, like Profs. Colebrooke, Muir, Wilson, &c., whose discoveries brought to light much interesting information about ancient India. It was a misfortune for India of to-day that among those benefactors they were few who could bring in mathematical astronomy to solve some vital points of Indian chronology. Prof. Colebrooke wrote some valuable essays on the Hindu system of astronomy, but it was our misfortune that his attention was not drawn towards the Indian chronology ; otherwise he was a man who could have done much to settle the dates of Hindu chronology.

Rama has been a personage of Indian history whose existence has not yet been denied by any scholar, yet see what conflicting dates have been given to this mighty king of ancient India : Sir William Jones places Rama in the year 2029 B.C., Tod in 1100 B.C., and Bentley in 950 B.C. Govvesio would place him about the thirteenth century before the Christian era !

Govvesio computes his date thus :—" From Rama to Sumitra, the contemporary, as it appears, of Vikramaditya (B.C. 57), fifty-six kings ruled in succession. By allowing on a reasonable computation an average of a little more than twenty years to each reign, we arrive at the thirteenth century before the Christian era." ("Ramagana," vol. i. Introduction.) While it is questionable whether any king by name of Sumitra ever reigned in India, or was a contemporary with Vikramaditya, Govvesio confesses—"But to this opinion I do not intend to attribute more weight than that of a probable conjecture." And so it is ; and a ridiculous one, too ; for Sumitra [1] was not a king contemporary with Vikramaditya, but *she* was one of the queens of the king Dasaratha, the father of Rama.

I now come to the point of my appeal. Here is the position of the seven primary planets at the birth of Rama plainly written in Canto xix. of the first book of the Ramagana : Moon in Cancer, Sun in Aries, Mercury in Taurus, Venus in Pisces, Mars in Capricornus, Jupiter in Cancer, and Saturn in Libra. The problem to be solved is this : Taking January 1, 1894, as starting-point, compute when the planets occupied the positions respectively referred to above, and when again they will occupy the same positions in the future ? Though the problem appears to be a simple one of permutation and combination, but I must confess with regret that none

[1] "Sumitra" is a Sanskrit word of feminine gender. As Sanskrit was a living language at the time of Vikramaditya, though perhaps only within higher circles of society, yet it could not be believed that this word might have been so degenerated as to be used in opposite gender at that time.