Tennyson and his Friends. Edited by Hallam Lord Tennyson. Pp. xiii+503. (London: Macmillan and Co., Ltd., 1911.) Price 10s. net.

THIS interesting collection of articles and reminiscences, nearly all by the personal friends of the late Lord Tennyson, and brought together by his son, will be a valuable addition to the Tennyson literature.

The book may be looked upon as a supplementary volume to the Memoirs, which appeared about four years after his death, for it gives a still further insight into the life, friendships, and opinions of the great poet.

A description is given of the early days in Lincolnshire and of the Somersby friends; also of his two brothers, Frederick and Charles, who were nearest him in age, and with whom he was most closely associated in school and college days.

Other articles give his intercourse with Lushington, Fitzgerald, Carlyle, Thackeray, Clough, and many others.

Tennyson's attitude towards science is shown in articles by Sir Norman Lockyer and Sir Oliver Lodge. The former points out "his unceasing interest in the causes of things, and in the working out of nature's laws," and compares him with Dante in this respect, more especially in the way he kept abreast of his time.

To the articles, some of which are reprints, are added several of the poems written by Tennyson to his Cambridge friends and to those of later years. The collecting into one volume of these many writings of interest cannot fail to give pleasure to all his admirers.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Microscope Stands.

THE discussion on microscope stands will do little good if it is directed towards the production of a universal type of instrument. As a maker of microscopes, I come into close contact with many branches of work the requirements of which are totally different. To make but one form would be a fatal mistake. The metallurgist cannot use the instrument which is best suited for the bacteriologist, neither will the Rosenhain metallurgical microscope suit the biologist. The Dick petrological microscope is quite unsuitable for the entomologist, and the binocular instrument, which demands long tubes and a great range of focus for the use of the lowest powers, will not satisfy the chemist. For the use of botanists, zoologists, and bacteriologists there is a certain similarity of requirements, but even here it would be unwise to endeavour to make all microscopes on one model. The work of the student in the botanical laboratory is totally different from that of the research worker who is making photomicrographs with the highest power immersion lenses.

The development of the microscope in the future will probably be in the direction of producing specialised types for specific work. Thus discussion on microscopes in general rather than of definite types is difficult, and is liable to become discursive. It can also only be misleading to set up a false comparison between English and Continental types. No such types exist at the present time.

English microscopes are made which are almost facsimiles of instruments of Continental manufacture, and although Continental makers were slow to realise the advantages of the more perfect adjustments provided from the earliest days in English microscopes, they have commenced to do so. The so-called Continental mechanical stage was invented by John Mayall, and placed on the market by at least three British firms before it was applied to foreign microscopes, and therefore the terms English and Continental have no meaning as describing types of instruments. A few questions which apply to all microscopes may be discussed generally, but the more definite points must be considered in connection with the branch of work for which the instrument is required.

The comparison of rigid as against spring fittings for the adjustments applies to all classes of the instrument, and a full discussion of this point can, in my opinion, only lead to one conclusion. The microscope must, above all things, have adjustments which are rigid and free from spring or tremor. They must be absolutely firm, and yet must respond to the slightest movement without either backleash or sag. The adjustments consist of metal slides worked by a screw, either direct or by means of a lever or cam, or by a rack and pinion. For the fine adjustment the sliding portion must be kept up to its work by a spring to prevent backleash. The slides or fittings of a microscope must be the very finest that skill can create, and to secure this they must fit throughout their entire length or the greater portion, and not at a few small points; being scraped or ground, so that the whole of the surfaces bed together; thus only can a perfectly rigid slide free from swerve, backleash, and tremor be obtained. If this is done, the wear that takes place during many years' constant use will be quite inappreciable, as there is no load on such fittings. The provision of spring pieces to take up wear is not only unnecessary, but injurious, because once such spring pieces come into play, the fittings will henceforth depend on the friction at a few points instead of a large surface.

Such fittings are not stiff, and become loose because they bear at a few points only, and are held up by screws which are liable to shake loose. It may be argued that if the slides were fitted accurately and the spring pieces were inoperative, only being there for use in case of wear, an advantage would be gained. That is not done in practice, for if the screws holding the spring pieces of a slide so made are released, it will be found to be quite loose. Moreover, it requires a skilled workman to set up the slide of a slow motion fitted with such spring pieces to obtain a perfect motion free from backleash or sag, and it is much better that he should refit the original well-fitted slides. Spring fittings are mechanically wrong for this purpose. Who would think of having an adjustable spring fitting for a theodolite centre? The quality of the adjustments, more especially the fine adjustment, has scarcely been alluded to, but this is the most important adjustment of the instrument. I am of opinion that the original form of a micrometer screw and a lever has never been equalled by the more elaborate cams recently introduced. The smaller the number of parts that go to make the mechanism, the fewer the points of contact or bearings to give that slight sag at the reversal of the motion which makes it so difficult to obtain the best focus with high powers.

As to the form of a microscope, its stability does not depend upon whether the base is of the tripod or so-called horseshoe pattern. It is universally admitted that it should stand on three points, and the test of stability that should be applied is, at what angle will it upset, and what force is required to make it do so.

Some tripods are more unsteady than some of the horseshoe-pattern stands, and *vice versâ*. It is merely a question of the position of the three points on which the instrument stands compared with its centre of gravity and weight. As probably nine-tenths of the small compact microscopes sold are of horseshoe and pillar pattern, it may be concluded that an overwhelming opinion exists in favour of this type for ordinary botanical and medical work. This is probably because the substage is rendered more accessible, and the stability produced by a heavy base is preferred in a compact instrument to that obtained by a lighter stand with a greater spread to the feet, which also occupies a larger space. The large tripod base as supplied on some of the best research microscopes is probably the most perfect stand for stability, but the lateral legs are more or less in the way of the manipulation of substage apparatus. The design of the mechanical stage is an illustration of the necessity of specialised stands for different classes of work. If the mechanical stage is incorporated in the instrument its travel is greatly limited, as it fouls the condenser or the large illuminating