a little less, though the standards of the latter were ex­tremely discordant among themselves. It seems to have been intended to abolish the wine gallon, which is also that of the apothecaries ; though it was recommended to retain the use of the Troy weight of the goldsmiths, employed also by the apothecaries. It had before been observed, that twelve wine gallons of distilled water weighed exactly 100 pounds avoirdupois ; but Dr Wollaston’s proposal to make an ale gallon exactly of ten pounds, afforded a greater facility in the operation of adjusting the measure, since it is not very easy to divide 100 pounds into twelve equal parts, with the weights in common use.

Some very important experiments on weights and mea­sures had been made a little before the date of this com­mittee, by Sir George Shuckburgh Evelyn, who had pub­lished an elaborate paper on the subject in the Philosophi­cal Transactions for 1798; and by the ingenious Mr Whitehurst, who obtained the length of the pendulum by measuring the difference of two lengths affording vibrations of different frequency. There were still some minute dis­cordances between the various measurements which ap­peared to be of the highest authority ; and some particu­lars in the Report of the committee of 1814 are mani­festly erroneous. Thus the weight of a cubic foot of water is stated, from a mistake in computation, to be 1000 ounces at 56½° of Fahrenheit, while, in fact, it is less than this even at 39°, the maximum of density ; and again, the cus­tomary length of the English foot, which has always been adjusted at the ordinary temperature of the atmosphere, and rather at that of the summer than that of the winter, as, for example, in the great trigonometrical operations of General Roy and his successors, at 62° of Fahrenheit, was, in the experiments, copied by the committee from Pictet, compared with the French standard, which was intended to be employed at the freezing point of water, without any correction for this diversity ; though Dr Young had long before pointed out the omission both in the Journals of the Royal Institution and elsewhere, and had computed the true length of the metre according to these operations of Professor Pictet, confirmed by some earlier ones of Bird, Maskelyne, andLalande, tobe 39∙3710 English inches, instead of 39∙3828.

In order, therefore, to remove any doubt which might still be reasonably entertained on the subject, Mr Davies Gilbert moved the House of Commons, in the year 1816, to present an humble address to the prince regent, praying that he would give direction that proper measures should be taken for ascertaining the length of the pendulum vi­brating seconds, and for comparing the French and Eng­lish standards with each other. In consequence of this address, the astronomer royal was in the first instance directed to perform the necessary operations ; and, upon his asking for some further assistance, the president and council of the Royal Society were requested to appoint a committee to co-operate with him. This committee consisted, besides the president and secretaries, of the late Sir Charles Blagden, Mr Gilbert, Dr Wollaston, Dr Young, Captain Kater, General Mudge, Mr Brown, Mr Rennie, and Mr Troughton. They began by discussing the several modes of making the requisite experiments which occurred to the different members ; and it was resolved, that as many of these methods as were preferred by each of them, should be separately carried into execution, in order to ob­tain collateral determinations of the required length. Mr Pond pursued the method of the French astronomers, and obtained some very satisfactory results, with an apparatus such as they had employed; Dr Young proposed a method derived from that of Whitehurst, and very perfect in theo­ry, but somewhat complicated, and which has never yet been practically executed ; Captain Kater invented, with great ingenuity, and employed, with great mechanical skill, an apparatus which does as much credit to his talents in the arrangement as to his perseverance in the experiments which he performed with it, and the accuracy of his deter­minations has been fully appreciated by mathematicians and practical astronomers throughout the world ; and his opera­tions have been repeated by many observers in different countries. Captain Kater's apparatus has been described in the article Pendulum. It owes no inconsiderable part of its advantage to the property supposed to have been subsequently demonstrated by Laplace, that, even if the opposite knife edges were considerably blunted and round­ed off, supposing both to be equally affected, the distance between them would still afford the true measure of the length of the pendulum without any further correction for the change of the axis of motion. [But that this celebrat­ed property, after all, is only true within certain limits, has been shewn in the article PeNDuluM, vol. xvii. p. 210.] It has also been demonstrated in this country by means of the experiments of Chladni on the elasticity of metals, that the temporary change of form depending on the compression of the steel edge, would be too inconsider­able to produce any sensible alteration of the length in question.

The object of Dr Young’s apparatus was to obtain two or more fine lines, traced at different parts of a scale, which should exhibit between them a certain determinate portion of the length of a pendulum vibrating seconds. He appre­hended that the accurate determination of the form and direction of the knife edges, and the measurement of the distance between any such edges, which was necessary in the method proposed by Prony, as well as in that which was subsequently invented by Captain Kater, would re­quire more skill and delicacy in the execution and the ob­servation than could be expected from any common work­man or experimenter ; and though Captain Kater, by his extreme care in combating every source of error, has, in point of fact, apparently obviated all these difficulties, yet it cannot be expected that so rare a combination of qualifi­cations should again be found, in case of a repetition of the experiments, and Dr Young’s apparatus may still, at some future time, be employed with advantage, at least for a col­lateral check upon the results.

The obstacle which prevented the completion of the observations which were made for some time with this ap­paratus at Greenwich, was the difficulty of obtaining a scapement so delicate as to count the number of vibrations, without sensibly interfering with their frequency. A very ingenious clockmaker was employed to furnish a scapement, of which the intention was to strike the pendulum slightly and instantaneously at the lowest point of its vibration, and then to recoil from it, so that even a considerable impulse might have little or no effect in altering the rate of the pendu­lum ; but it was in fact observed, upon comparison with the clocks of the observatory, that the vibrations in larger arcs were more frequent than those which were performed in smaller ; so that the scapement must have exerted a very considerable influence on the time of every vibration. It was therefore found necessary to abandon this method of making the experiment ; but there would be no diffi­culty in conducting it very satisfactorily by means of a journeyman clock, with a wooden or brass pendulum, capa­ble of having its length altered so as to become comparable with the vibrations of Dr Young’s pendulum in its different states; and it might even be found sufficient to observe the pendulum, with the same scapement, so altered as not to give any impulse whatever, but merely to reckon the vibrations by means of the detent during the spontaneous vibrations of the pendulum, which, on account of its great weight, would be continued for a considerable time in consequence of the first impulse, taking care that the de­tent should be struck exactly at the middle of the vibra-