Science Notes.

A GREAT PHYSIOLOGIST.

The year just coming to its end has seen the death of an unusual number of celebrated scientific men. The names of Huxley and Pasteur are familiar to almost every newspaper reader, for reasons which we have attempted to define in these columns. Huxley was a wonderful exponent of science to the people, a friend to popular education, and an enemy of clericalism and dogma. Pasteur was fortunate to a much greater degree than are most scientific inquirers, in having as a reward for his labours the knowledge of suffering avoided in the case of countless numbers of men and animals.

By the death of Ludwig, some months ago, the science of physiology sustained a severe loss, although his name is not like those above, a household word.

We read that at the time of his death arrangements were being made to have a portrait painted of Ludwig, which was to be presented on his eightieth birthday as a small token of the esteem in which he was held by his pupils, and one might therefore suppose that his working days were already over. It was not so, however, for an old pupil visiting him in 1894, says he exhibited the same interest as in days past in everything new in the scientific world. He lectured during the session of 1894-1895, and the only sign of age he showed was a fear that he was fast becoming old, and was no longer able to perform his duties as he thought they should be performed.

As to Ludwig's work, it does not, of course, appeal to anyone who is not in some small degree, at all events, a student of physiology, but such a student, reading an account of Ludwig's investigations, cannot fail to be struck when he finds how much of what is now contained in every text-book of physiology is due to these investigations.

An instrument called the kymograph is, perhaps, one of the best known results of Ludwig's work. This is used, in a manner to be described presently, as a means of recording blood pressure. Blood pressure was tested in a more primitive manner by the Rev. Stephen Hales, rector of Teddington, who records the result of an experiment in 1727. He introduced the lower end of a vertical tube, seven or eight feet long, into the femoral artery of a mare, and the blood rose in the tube to a height of seven feet. This proves that blood in an artery is under great pressure, which is exerted by the elasticity of the artery brought into play by its distended condition. At each contraction of the ventricles a fresh quantity of blood is forced into arteries already full. The flow of blood is checked in the smaller arteries and capillaries, and hence the pressure exerted by the blood on the arterial walls, and by the arterial walls on the blood. About a hundred years after the Rev. Stephen Hales' experiment, a French physician improved upon his apparatus by the use of a V-shaped tube containing mercury. When one limb of the tube is connected with an artery by means of a tube containing sodium carbonate solution (to prevent coagulation of the blood), the blood pressure forces down the mercury in the nearest limb, and it rises to a corresponding degree in the other. The weight of the column of mercury, by which the heights in the two limbs differ, is the measure of blood pressure, and with each contraction of the ventricles, or rather with each pulse-wave in the artery, the mercury in the second limb rises and falls. Ludwig added to this apparatus a float, which rests on the surface of the mercury; this float is attached to a recording needle, and its point touches a smoke-blackened drum, which revolves slowly by means of clockwork. It will be readily understood that the needle moves up and down with the passing of each pulse-wave, but does not move from right to left or *vice versâ*. Owing to the movement of the drum, however, say from right to left, an undulating line is made to be read from left to right. The crests of the curve indicate maxima of pressure, and the depressions minima.

Ludwig's kymograph is not only important in itself, but it proved to be the forerunner of many instruments for the purpose of indicating graphically (*i.e.*, by means of curves) physiological phenomena.

Notes on Art.

ANNALS OF WESTMINSTER ABBEY.

There has been an interesting little show of drawings in an upper room at the Institute of Painters in Oils, during the past week. Messrs. Cassell have just brought out a sumptuous volume entitled "Annals of Westminster Abbey." The Dean of Westminster has written a preface, the letterpress is by his daughter, and, like all good books of the kind nowadays, it has been really well illustrated. The original drawings for these illustrations are what were on view, and they were well worth seeing, as was testified by the perfect mob of people who came to look at them, and made it difficult to see anything at all.

The greater part of the drawings are by Mr. Hatherell, of the Royal Institute, and Mr. Paget: and of these two Mr. Hatherell is by far the more artistic and pleasing. Mr. Paget displays a most laudable desire for correctness of detail, but his work is hard, and lacking in light and shade. It seems a pity that it is always impossible to reproduce in the printed page the same size as the original design. Several of Mr. Hatherell's prettiest sketches seemed to me to suffer much from their compression, when I looked at them in the book afterwards.

As the work is meant to deal mainly with the historic associations of the Abbey, there is less architectural illustration than I, personally, should have been glad to see; but I suppose there are many handbooks already in existence which exhaustively treat the subject from this point of view.

One of those which seemed most satisfactory was by a lady—Miss Edith Evelyn—"The Chapel of St. Benedict." The work in this is exceedingly good and clear; and all the others of her contribution also merit praise. It is to be noticed that the prices she asks are only about half what is asked by the other artists; is this because of sex? It would be interesting to know. The half-dozen from her pencil could be owned for ten pounds, and would be very well worth the money.

Several of the subjects chosen seemed to be a little hard to connect with the Abbey; as, for instance, the death of Francis Villiers at Kingston (No. 46). But perhaps the letterpress explains. To the same class

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