THE FORMATION OF FAT IN THE ANIMAL BODY.

There have been few more interesting chapters on the history of physiology than that which deals with the development of force within the human frame. Since Mayer first enunciated the proposition *Ex nihilo nihil fit* as applicable to the animal as well as the purely physical world, much has been done. But nothing has been more clearly made out than this: that, on the whole, albuminous substances are applied to the repair of waste; whilst hydrocarbons are either directly burnt up and appear as force, or are laid up as a reserve in a new and modified form. The form in which they are thus laid up in plants is starch; in animals, fat. Here, however, as far as animals are concerned, we enter on the borders of a most difficult question—that is, the relations of the substance called glycogen produced in the liver; but this, in the meanwhile, we must put on one side. No men have done more in their own peculiar way than Messrs. Lawes and Gilbert to elucidate practically the applications of abstract physiology to everyday life, or perhaps we might put it *vice versa*. These two gentlemen have for many years devoted their attention to applied physiology, especially as regards farming operations, and in the last number of the *Journal of Anatomy and Physiology* they supply a kind of *resume* of their results with respect to the formation of fat in the animal body.

It was first advanced by Liebig that a great part of the fat of the animal body was derived from hydrocarbons other than fat. This view was strenuously combated by none more than by the two distinguished Munich Professors—Pettenkofer and Voit. As every physiologist knows, Pettenkofer had a large air-tight chamber constructed, in which a man might live, and by means of which the various gases excreted by the human body might be collected for analysis. As regards the formation of fat, the experiments made by these gentlemen were on a dog—rather, we should think, an unfortunate selection. In the result they found, as they thought, that the fat deposited in the animal resulted—first, from fatty substances contained in the food; secondly, from the decomposition of albumen; that starch or sugar only saved the albuminous materials of the body from being partially converted into fat.

The experiments long ago undertaken by Messrs. Lawes and Gilbert led to a totally different belief. They were partly made with regard to the feeding of ruminants, and partly with regard to the feeding of pigs. In 1866 they announced their results in a short paper published in the *Philosophical Magazine*, which we noticed at the time; but these results have been called in question, as above indicated. The authors have since reviewed their investigations, and the result is to be found in the article just referred to. They find that, as far as ruminants go, the results are not decisive, these animals having no special predisposition to the formation of fat; but in pigs it is otherwise. In dealing with pigs, the proportion of nitrogenous to non-nitrogenous substance in the food used was con-