

the Century Dictionary's definition of artificial, as "made or contrived by art, or by human skill and labor; opposed to Nature," is sufficient to banish this feeling; for, after all, in the particular case in hand, being ignorant of the exact methods pursued by Nature, we may be simply forcing her to reveal her methods, to the final results of which we neither add nor subtract one jot or tittle. The same objections may be made to the expression *artificial manufacture* of Graphite, for we may not be sure that the process forced upon her is not identical with that of her own selection. *Manufactured graphite* would be quite appropriate, were it not for the fact that it is popularly applied to articles made of graphite.

It may not detract from the general interest in this subject to call attention, in closing, to the fact that graphite, first shown to be an elementary body, an allotropic form of carbon, in the first year of the nineteenth century, is in this, the last year, made to order in great quantities, and that it will, before the close of the century, become an article of ordinary commerce in its new form. Perhaps it will take its place as the primitive form of carbon—the one it assumes under normal conditions.

NOTES AND COMMENTS.

ARTIFICIAL ALBUMIN.

In the London *Chemical News*, Mr. Alfred H. Allen questions the accuracy of the published reports respecting the artificial production of a laboratory product identical with albumin, which was credited to Dr. Leo Lilienfeld at the recent International Congress of Applied Chemistry at Vienna.

This announcement was received with unusual interest, because of the possible incalculable value of a practicable method of forming in the laboratory this product which is the fundamental constituent of all nitrogenous (or flesh-forming) foods.

Mr. Allen comments on the subject in the following terms:

"From the accounts which have hitherto come to hand, it appears that it is not true albumin of which Dr. Lilienfeld claims to have effected the synthesis, but 'peptone,' which is a very different thing. It is said to be produced by the condensation of glycocine (amido-acetic acid) with phenol, by means of phosphorus oxychloride. The reaction is said to occur quantita-

tively and with great facility, allowing of the whole process being shown at the meeting. Further, Dr. Lilienfeld is said to have demonstrated, by the most conclusive tests, the absolute identity of his product with natural peptone, or—according to some accounts—with true albumin. Seeing how very ill-defined are the chemical tests for ‘peptone,’ and that more than one kind of peptone is recognized, this part of the account must be received with caution. Still more doubt attaches to the statement that Dr. Lilienfeld’s product has the same elementary composition as natural peptone (or albumin). Seeing that natural albumin and peptone both contain sulphur as an essential constituent, and that Dr. Lilienfeld’s process does not involve the employment of sulphur in any form, there seems to be a screw very loose somewhere.

“Although the description of the mode of formation of Lilienfeld’s body appears to negative the conclusion that he has effected the synthesis of either albumin or peptone, it by no means follows that he has not produced an albuminoid substance of great theoretical interest.” W.

DOES IT PAY TO BUILD LARGE TELESCOPES?

Prof. George E. Hale, a noted American astronomer, answers this question by summarizing the principal advantages of a large telescopic object glass—40 inches aperture in the special case as compared with a smaller one of 10 inches.

These advantages consist:

(1) In the fact that the larger glass is capable of giving much brighter star images, and thus of rendering visible faint stars that cannot be seen with the smaller glass.

(2) In the fact that it gives at its focus an image of the object enlarged in proportion to its greater diameter.

(3) In its capacity to render visible, as separate objects, the components of very close double stars or minute markings on the surface of a planet or satellite.

The principal disadvantage of the large glass is that it demands better atmospheric conditions to bring out its best qualities.

He adduces several important astronomical discoveries which have been made possible only with the aid of large glasses, viz.: the discoveries of the fifth satellite of Jupiter and of the two satellites of Mars. Furthermore, the author declares that much fine detail which he has never been able to see with the smaller glass, is “clearly and beautifully visible” with the 40-inch glass. Also, he states, micrometrical measurements are effected with much more ease and certainty with the large instrument.

“It is particularly in astrophysical research that a great telescope is advantageous. It is necessary in spectroscopic observation to have as much light as can be gathered into a single point, and for this a large glass is essential. It follows from this that great telescopes have a mission to perform. While, on the one hand, they do not possess the almost miraculous gifts which imaginative persons would place to their credit, they do possess properties which render them much superior to smaller instruments and well worth all the expenditure which their construction has involved.” W.