

cise idea of this property by words, yet it is one which is instantly recognised when a sample of this starch is attentively examined. It arises from the large size of the amylaceous grains. Moreover, potato-starch wants that dull or dead white appearance presented by West Indian arrow-root. It gives the idea of the particles being slightly translucent.

In the large size and slight translucency of its grains, *tous les mois* agrees with potato-starch: indeed, they are somewhat larger than those of the latter starch. Hence, therefore, the naked eye may confound these two feculæ.

The microscope is the most important agent in distinguishing the different starches from each other; and by it we can readily detect potato-starch. We recognise it by the *size, shape, and structure* of its grains. Though the *size* varies somewhat, yet on the average it exceeds that of other commercial starches, always excepting *tous les mois*, whose grains, as I have already stated, are rather larger. I have, however, occasionally met with samples of potato-starch, whose grains nearly equalled in size those of *tous les mois*. The actual size of the grains varies from  $\frac{1}{80}$  to  $\frac{1}{30}$  of a line in diameter. The *shape* of small (or youngest?) grains of potato-starch is circular or globular; but that of the larger ones is elliptical, oblong, ovate, or obtusely triangular. Perhaps, we may assume that the normal form of the fully developed particles is ovate. The *structure* of the grains is the next point deserving of our attention. When examined by a polarising microscope, we observe, by the black cross which they present, that they possess a depolarising or doubly refracting structure, which is to be regarded as an indication of their consisting of a structure unequally dense. By the common microscope we discover, on some part of the surface of the grain, one hilum, or, in some cases, two hila—one at either end, or two at the same end. The hilum is a circular hole, which was formerly thought to be a kind of umbilicus, by which, according to some writers, the starch-grain was originally attached to the parent vesicle in which it was developed. It is now regarded as the circular section of the tube or passage by which the amylaceous substance is introduced into the interior of the starch grain. On large and old grains of starch we observe a number of cracks which commence at the hilum.

On the surface of the grains is a series of curved lines, forming a system of either concentric or excentric rings or zones, which surround the hilum. They are similar to the curved lines observed on bivalved shells, as the mussel, and which indicate the terminations of the successive layers of which these shells are composed. The grains of every kind of starch, which I have hitherto examined, present a hilum and some traces of rings; but in the smaller grained starches, as rice-starch and the Portland arrow-root (starch of *Arum maculatum*) they are very imperfectly perceived. *Tous les mois* and potato-starch, probably on account of the size of their grains, show these rings in the most distinct manner.

The starch grains are composed of a series of juxtaposed concentric layers, which may be compared to the laminae of an onion. Of these layers, the innermost are the most recently formed. The composition of all of them is the same, but their cohesion is different,

the inner or younger ones being less cohesive, and, therefore, more readily soluble than the outer or older ones. The rings or rugæ, so distinctly perceived on grains of potato-starch, depend on the concentric layers.

I am acquainted with no absolute chemical test by which potato-starch can be certainly distinguished from other starches. All the amylaceous substances possess certain chemical characters in common, one of the most remarkable and striking of which is, that of forming with iodine a blue compound. But these characters are possessed in unequal degrees by different starches, and thus the chemical peculiarities of potato-starch are rather differences in degree than absolute and positive distinctions. Its greater solubility in boiling water serves to distinguish it from wheat-starch, and hence it is frequently called, in contradistinction to the latter substance, *soluble starch*.

How then, it may be asked, is it that potatoes by boiling do not yield a mucilage of starch? The answer is, that the starch grains are contained in vesicles which compose the cellular tissue of the potato, and that the membrane of which the vesicle is composed is not soluble in water. Moreover, it is to be remembered, that these vesicles contain an albuminous liquor in which the starch grains are immersed, and that by heat the albumen of this fluid is coagulated, and thus probably the starch grains become enveloped by a thin film of coagulated albumen, which is insoluble in water.

The greater facility with which potato-starch gelatinises when rubbed in a mortar with a mixture of equal parts of commercial hydrochloric acid and water, has been recently suggested as a means of detecting it when mixed with rice-flour. The strong smell of formic acid emitted by it, when rubbed with hydrochloric acid, has also been proposed to characterise it.

Commercial potato-starch contains about eighteen per cent. of hygrometric water.—*Pharm. Journ.*

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## THEORY OF MENSTRUATION.

Dr. Raciborski, in a memoir on the function of menstruation, presented to the Academy of Sciences at Paris, has given the following as the conclusions at which he has arrived:—

1st. That the course followed by the Graafian follicles, during their progressive development in women, exactly resembles that which they follow in other mammifere, as we may easily assure ourselves, especially by examining the ovaries of the sow.

2nd. The rutting seasons offer the greatest analogy, anatomically considered, to the menstrual periods. Both are coincident with the highest degree of development of one or more follicles, and terminate by their rupture, and the expulsion of the ovum, or of a true fetation. They have also in common a greater or less congestion of the uterus, vagina, and external organs.

3rd. The menstrual periods, like those of rutting, are closely connected with the reproduction of the species.

4th. The organs described by authors under the name of *corpora lutea*, or glandular bodies, are

nothing but the follicles of Graaf, in a stage of development more or less advanced.

5th. The tumefaction of the Graafian follicles, and their elevation on the surface of the ovaries, seems to be an indispensable condition for fecundation of the ova.

6th. The orgasm accompanying coition may of itself suffice to produce this state of the follicles, without its having been previously prepared by the instinctive impulses of nature; only, as in that case, this state and disposition of the follicles is not completed till a longer or shorter time after coition, conception is thereby retarded, and is, moreover, far less certain than when connection has taken place while the follicles were already swollen and prominent, as they are at the rutting season, and at the approach of the menstrual period.

7th. That, as regards the faculty of reproduction, woman seems to occupy a place intermediate between female animals which have seasons of heat or rutting, and those which are always capable of fecundation from the mere orgasm excited by coition, without other preparation on the part of nature. Their nature, however, approaches more nearly to that of the former class, our statistical researches having informed us that of 100 women, six or seven at the most become pregnant after sexual intercourse at a distance from the menstrual period; while, in most women, conception dates evidently from such intercourse at the moment of the catamenial evacuation or some days days before or after the menstrual period.

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### MESMERISM.

TO THE EDITORS OF THE PROVINCIAL MEDICAL JOURNAL.

GENTLEMEN,—In No. 146 (July 15, 1843), you published a very able and interesting Address on Mesmerism read at the annual meeting of the Bath and Bristol Branch of the Provincial Medical and Surgical Association, held at Bristol, June 29, 1843, by J. B. Estlin, F.L.S., &c. I have never seen the subject so well and so judiciously treated before.

I think that the address is calculated to do a great deal of good, and that Mr. Estlin deserves our best thanks for writing and publishing it.

But I should hardly have troubled you or him with my opinions on this subject, had not Mr. Estlin himself particularly requested his professional brethren to do so. He says—"In conclusion, I have only to add, it will be gratifying to me to find that in the sentiments I have advanced I meet with the accordance of the majority of my professional brethren." Mr. Estlin thinks that the less medical men have to do with these Mesmeric and phreno-Mesmeric exhibitions the better. He says—"My object is to exhort my professional brethren not to listen to the call made upon them to lend themselves to assist in the inquiries which are demanded of them into this 'vexata questio';" and, in other place, he says—"I cannot but strongly feel that our profession will best consult its own dignity and the benefit of society by keeping aloof both from the investigations and the investigators that have lately been before the public in this and other cities;" and, again, "It seems to

me impossible for a medical man to engage in the practice of animal magnetism without resorting to expedients and allying himself with persons not altogether congenial to a refined taste and cultivated mind." I entirely concur in the truth and soundness of these observations, and circumstances which have recently taken place in this town tend very forcibly to corroborate the opinion. Here, as in other places, it was asked by many, and also by the press—Why do not the medical men interfere in this matter, and either explain the truth or expose the fallacy of the assertions and experiments which are made and exhibited? Acting upon this suggestion, an attempt was made, and a most eminent man, our senior physician, accompanied by several other medical men, attended one evening at the theatre for the purpose of witnessing the performance and demonstrating its absurdity by such observations and questions as the cases might suggest. But the attempt was an entire failure. Although we had been to a certain degree called upon to make an appearance, the populace numerously assembled, would not hear them. Ignorantly happy in their credulity, and bigotedly determined to believe what they could not understand, they would admit of no interruption, no investigation, and to the very few and insufficient observations our learned friend was able to make, the most vague and vulgar answers of the lecturer were considered satisfactory, and received with acclamation.

The triumph of phreno-magnetism was shortly afterwards blazoned forth through the town in large characters, and the disciples of delusion claimed a victory. A previous attempt had been made by other medical men at a smaller meeting, but with no better success. The people were determined to believe, and the attempt to undeceive them was perfectly useless.—"Qui vault decipi decipiatur." I was not present at either of these occasions, nor, indeed, at any of the itinerant's performances. Having availed myself of our local press as a medium for making my opinions known, I thought I might fairly excuse myself from the disgusting annoyance of personal attendance. I have published two letters on the subject, but as they are addressed to the editor of the "Northampton Herald," and appeared in that paper, I presume you will not think proper to make use of them. I cannot take leave of Mr. Estlin's admirable address without quoting, in conclusion, his last and finest sentence, "When our duties call upon us for the unavoidable infliction of pain, let us not harass our patient by attempts to ascertain if he be one of those few who may be thrown into such a state of unconsciousness as to be insensible to it, but let us endeavour to strengthen his mind to bear up under his trial, by suggesting to him Christian motives and a Christian's hopes."

I am, Gentlemen,

Your obedient servant,

H. TERRY

Surgeon to the Northampton General Infirmary,  
Surgeon to the Northamptonshire Militia, and  
late Assistant-surgeon in the Army.

Northampton, July 31, 1843.

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