$$E = \frac{e^2 k}{6a} + C e^{-\frac{m^2}{2c^2}} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

where C is an arbitrary integration constant. For the LORENTZ electron we have an $m = \frac{m_0}{k}$. If we postulate that the corresponding equation for the energy will also hold good, namely $T + U + E = \frac{1}{k}(T_0 + U_0 + E_0)$, then we must put $C = 0$ and we find again for E the value calculated by POINCARÉ and ABRAHAM.

Now it appears a posteriori that

$$\mathfrak{G}_{tot} = \frac{\partial}{\partial w}(T - U - E) = \mathfrak{G}$$

From this follows that the two corrections which we mentioned above need not be applied to $\mathfrak{G}$ in order to find $\mathfrak{G}_{tot}$. The two corrections appear to cancel each other. This result is remarkable. It proves that the energy inside the electron is stationary in space. At the frontside Poynting's vector is directed towards the electron. Hence when the energy reaches the frontside of the electron it is suddenly stopped in its motion and it remains at rest inside the electron till it is reached by the backside of the electron. Then it is again put into motion as radiating energy, but now the motion is directed away from the electron.

I will remind that the usual way of calculating the radius of the electron depends on the supposition that $\mathfrak{G}_{tot} = \mathfrak{G}$. For the applicability therefore of this calculation it is decisive whether or no the suppositions assumed above are correct.

1st. that the supplementary energy E must be introduced in the function of LAGRANGE as potential energy, in agreement with the assumptions of POINCARÉ and of ABRAHAM.

2nd. that the mass of the electron is equal to its energy $\times \frac{1}{c^2}$.

Chemistry. — "*Amygdalin as nutriment for Aspergillus niger.*" II. By Dr. H. I. WATERMAN. (Communicated by Prof. Dr. J. BÖESEKEN.)

(Communicated in the meeting of February 24, 1917).

In an earlier communication [1]) I have shown that amygdalin is a better nutriment for *Aspergillus niger* than glucose, at least with regard to the weight of mycelium obtained.

[1]) These Proceedings January 26, 1917 p. 922.

TABLE. The influence of amygdalin on the development of Aspergillus niger with benzaldehyde as organic nutriment. Temperature: 33°.

	A_1	B_1	C_1	D_1	E_1	F_1	G_1	H_1
Composition of the nutrient liquid	45 cM.³ P 5 cM.³ H_2O	25 cM.³ P 25 cM.³ H_2O	20 cM.³ P 30 cM.³ H_2O	10 cM.³ P 40 cM.³ H_2O	5 cM.³ P 45 cM.³ H_2O	2 cM.³ P 48 cM.³ H_2O	1 cM.³ P 49 cM.³ H_2O	50 cM.³ H_2O
Development after one day	—	—	?	?	?	?	—	—
Development after two days	—	—	—	—	?	+ (slight)	+ (slight)	—
	A_2	B_2	C_2	D_2	E_2	F_2	G_2	H_2
Composition of the nutrient liquid	45 cM.³ P 5 cM.³ Q	25 cM.³ P 5 cM.³ Q 20 cM.³ H_2O	20 cM.³ P 5 cM.³ Q 25 cM.³ H_2O	10 cM.³ P 5 cM.³ Q 35 cM.³ H_2O	5 cM.³ P 5 cM.³ Q 40 cM.³ H_2O	2 cM.³ P 5 cM.³ Q 43 cM.³ H_2O	1 cM.³ P 5 cM.³ Q 44 cM.³ H_2O	5 cM.³ Q 45 cM.³ H_2O
Development after one day	—	—	—	?	—	+ (very slight)	+ (slight)	?
Development after two days	—	—	—	?	?	++	++	—
	A_3	B_3	C_2	D_3	E_3	F_3	G_3	H_3
Composition of the nutrient liquid	50 cM.³ H_2O	25 cM.³ P 25 cM.³ Q	20 cM.³ P 25 cM.³ Q 5 cM.³ H_2O	10 cM.³ P 25 cM.³ Q 15 cM.³ H_2O	5 cM.³ P 25 cM.³ Q 20 cM.³ H_2O	2 cM.³ P 25 cM.³ Q 23 cM.³ H_2O	1 cM.³ P 25 cM.³ Q 24 cM.³ H_2O	25 cM.³ Q 25 cM.³ H_2O
Development after one day	—	?	—	?	—	?	+ (slight)	?
Development after two days	—	—	—	—	+	++	++	—

The solution *P* was prepared as follows: 1,5 gr. NH_4NO_3, 1,5 gr. KH_2PO_4, 1,5 gr. $MgSO_4 . 7 H_2O$ and ± 0,3 gr. $CaCl_2$ were dissolved in boiling distilled water; after cooling ± 1,85 gr. benzaldehyde was dissolved and the clear solution was filled up with H_2O to 1 Liter.

Solution *Q* was obtained by dissolving 2,5 gr. amygdalin in distilled water, this solution was boiled during a short time and after cooling filled up with H_2O to 250 cM³.

The possibility was considered that *within* the cell benzaldehyde might be formed, whilst at the same time it was proved that *outside* the cell important quantities of amygdalin by no means should be converted into glucose, benzaldehyde and hydrogen cyanide.

This result was confirmed in another way by a new series of experiments, from which it is to be concluded with certainty that *amygdalin without any preceding conversion* into glucose benzaldehyde and hydrogen cyanide, is *absorbed* by the cells.

The referential experiments are united in the table.

From these experiments it follows that the addition of amygdalin diminishes the noxious influence of benzaldehyde. Compare E_1, F_1 and G_1 on one side with E_2, F_2, G_2 and E_3, F_3, G_3 on the other side.

If a conversion into glucose, benzaldehyde and HCN should precede the absorption of amygdalin just the contrary should be stated.

Physiology. — "*Experimental researches on the permeability of the kidneys to glucose*" [1]). By Prof. H. J. HAMBURGER and R. BRINKMAN.

I. THE PROPORTION BETWEEN K AND CA IN THE CIRCULATING FLUID.

(Communicated in the meeting of January 27, 1917).

1. *Introduction.*

No solution has been offered to the question of importance to physiologists as well as to clinicists, viz. why the urine of a normal person is entirely or all but entirely free from sugar as long as the sugar-percentage of the blood serum does not rise above a certain concentration, and why as a rule glucosuria only sets in when accompanied by hyperglycaemia.

Two explanations suggest themselves:

It may be supposed that the normal glomerulus epithelium is proof against ± 0.1 % of glucose without becoming permeable to it, but cannot keep back all the glucose of a higher concentration. Not much can be said in favour of this view, for it is not very likely that cells which are permanently exposed to a 0.1 % solution of a physiological non-electrolyte such as glucose should be changed by a 0.2 % solution [2]).

[1]) A more detailed account will be published elsewhere.

[2]) We shall not discuss here the hypothesis of a glomerulus-epithelium absolutely permeable to glucose, with back-resorption of it through the kidney-ducts, nor the oxidation of the glucose in the kidney.