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And do you ask how woody fibre for instance, can be formed from carbon and water ? I answer, thus :

Whereas the root of the plant is continually employed in sucking in liquid food, the million mouths of the leaves are occupied in inhaling gaseous food Carbonic acid is com posed of carbon and oxygen  $\cdot$  all day long the leaves are absorbing carbonic acid from the air; the plant appropriates the carbon and rejects the oxygen Water abounds in the sap of the plant, hence water and carbon are both abundantly present in the pores or vessels of the green leaf. Now as woody fibre consists only of carbon and water chemically combined, it is easy to see how, when these matters meet in the leaf, woody fibre may be produced by their mutual combination.

The three principal nitrogenous bodies we mentioned above, Albumen, Fibrin, and Casein, are very like one another in composition. They are sometimes called *albuminoids*, from their leading representative, albumen, which occurs in a nearly pure state in the white of egg. Gluten, occurs as we know, in wheat, and is largely composed of fibrin, an albuminoid met with in blood, from which it can be separated by gently beat ing the blood with a few twigs. Small threads, or fibres will adhere to the twigs, and will consist of the fibrin of the blood The value of foods depends greatly on the quantity of these albuminoids they contain. *Casein* occurs in the ourd of milk, and in pease and beans, when it is termed *legumin*, from these plants belonging to the order *leguminasce*. The following tables will show how little these albuminoids differ in composition from one another : Albumen consists of :-

Carbon	5484
Hydrogen	709
Nitrogen	1583
Oxygen with Phosphorus and Sulphur.	2424

10,000

Vegetable fibrin consists of :---

Carbon	5456
Hydrogen	690
Nitrogen	1572
Oxygen with Phasphorus and Sulphlum	2282

## 10,000

I hope to resume this subject next month.

ARTHUR R. JENNER FUST.

## **REVIEWS.**

The Journal of The American Agricultural Association-Jely and October, Vol. 1. Nos. 3 and 4.—New-York : Pu blished by the Association, at 127 Water Street—1881.

The American Agricultural Association does not seem to have grown up, but to have sprung suddenly into mature life, like Minerva from Jupiter's—well, the simile is rather trite. They do not appear, in the United States, to have much difficulty in sccuring contributors to such a publication as the one under consideration; and the surprising thing is, that there is no signs of what we call trash, and literary men call padding. One great and good feature strikes the reader forcibly: the writers are not restrained from expressing in the very fullest manner their convictions, and thus, as I believe in almost all modern magazines, truth is brought out by that action of mental friction which can alone produce it. I used to think that the people of the United States were afraid of truth; but this journal, written by men from all parts of that extensive country and of all shades of opinion, shows me, plainly, that I was most egregiously mistaken.

There is only one blot in the publication: a reply to an article in the first number written by Mr. Edward Atkinson,

of Boston, and reprinted in the present issue. The author of the reply, the Hon. L. E. Chittenden, "President of the Anti-Monopoly League," whatever that may mean, seems to have forgotten that, even in politics, a certain amount of respect is due to an opponent. It is hardly polite to term an opponent's argument an "artful,skilful,deceptive presentation of selected facts, calculated to mislead the people instead of instructing them, written to serve the purposes and perpetuato the control of the most despotio and anti-republican monopoly that has ever existed—the present railroad monopoly of the United States." If this is the style used in polemies among our neighbours,I do not wonder that so many gentlemen refuse to enter the arena of public life. Why, our journals are hardly more illbred in this province of Quebec !

Au restc, the Editor puts the answer to Mr. Chittenden rather neatly: "Railroad companies that can be obliged," by competition, I suppose, "to reduce their profits in ten years 58.6  $o_{10}$ , and to reduce the cost of working 49  $o_{10}$ , and their charges to their customers 52.4  $o_{10}$ , as Mr. Atkinson shows, are monopolies of which we cannot have too many."

Professor McBryde's article, on "Ancient Husbandry-Rome and her provinces," will well repay perusal. He shows that the Silo, or rather Siro, is no new thing, but was practised by the Orientals long previous to their invasion of the West. That the Romans dried their wet lands by means of covered drains, most people who are interested in ancient agriculture know, but it will probably be new to my readers to hear that as, 50 years ago, the people in the South-East of England made drains of straw twisted into ropes and covered with earth, so, Columella, writing 1800 years ago, recommends the conduits to be made of "a bundle of twigs twisted together in the form of a rope," and this in the absence of small stones or of gravel, which he evidently considers the better ducts. These drains are to be made three feet deep, shelving in width from top to bottom; and when finished, they are to be levelled with the surface, and the grass or turf replaced. They burned the stubble, but were in doubt as to its effects; whether the ashes afforded plant-food, or the fire destroyed some evil matters in the earth; which latter idea, illis omne per ignem excoquitur vitium, seems to be a forerunner of the excrementitious theory of De Candolle. "The value of tillage was fully appreciated, and many different styles of ploughing were practised." Straight furrows were clearly held in great estimation, for a man who ploughed crookedly was said delirare, or as we should say "to be delirious"; and the boy who mismanaged the harrows was said prævaricare, whence comes our word, to prevaricate.

Green manuring was a common practice. Columella says: "If the lupins, vetches, ler "is, etc., are ploughed down when green" (preferably, when in flower), "they fully supply the place of farmyard manure." Columella and Palladius, both, give instructions for the cultivation of lucern which differ very little from those in Stephens' Book of the Farm.

But, to my mind, the directions for the cultivation of wheat are the most striking of all the passages of Columella's book. Hallett, of Sussex, Eng., is the choragus of wheat culture, but our friends of ancient Rome, Celsus among others, were far in advance of him, "For seed, the best ears should be selected at harvest and separately threshed. The best grains picked from those that rofuse to pass through a fine sieve should be chosen." And the great agronome, Virgil, says; "I have, nevertheless, seen seed long carefully selected degenerate unless the largest grains be culled by hand, for thus it is fated that all things should deteriorate, and revert to their original states;" adding by way of illustration, the simile of the boat, which all my classical readers will remember.

The experiment Farm of the "Rural New-Yorker" scems to be conducted on the same principle as Dr. Lawes' well