VARIATIONS IN THE RATE OF AGRICULTURAL PRODUCTION AND ONE OF THEIR CAUSES.*

(John Hyde, in October Science.)

The twenty years ending with 1897 witnessed the harvesting in the United States of crops of corn, oats and rye, the yield per acre of which was from 50 to 60 per cent greater than the corresponding yield in certain other years of the same period; of crops of potatoes in which it was from 80 to 87 per cent greater than in other years of the period under consideration, and of crops of buckwheat in which it was from 80 to 130 per cent greater than in the case of certain other crops of buckwheat grown within this same period of twenty years. On the other hand, the highest annual yields per acre of wheat, cotton, hay, barley and tobacco were only 50, 39, 39, 36 and 23 per cent, respectively, higher than the lowest. This remarkable non-uniformity of fluctuation has suggested to the author of this paper the operation of some law not hitherto generally recognized, and the examination of the statistics of a large number of crops for each separate state during a period of twenty years shows that, entirely independently of whether the average yield per acre be high or low, the nearer the approach to the region to which a product is indigenous the more uniform will be the rate or production from year to year, and the further the departure from such region the greater the liability to fluctuation.

For the purpose of this abstract, four products only need be considered: oats, barley, cotton and corn. The period covered is twenty years, 1878-97, and the comparison is based in each case—not upon the two extreme deviations, but on the means of the three highest and the three lowest yields per acre in the twenty-year period, the figures given representing the per cent of the deviation of these means from the mean of the entire period.

In the case of oats in 12 of the most northerly states of the union (the Transition zone† of the Merriam Life Zone Map) the deviation from the twenty-year average was only 34.23 per cent, only two states exceeding 40 per cent; in the Upper Austral (from New Jersey, Delaware and Maryland to Kansas and Nebraska) the deviation was 53.95 per cent, only one state having less than 40 per cent, and in the Lower Austral (from Virginia, the Carolinas and Georgia to Texas and Arkansas) it was 62.78 per cent, no state falling below 50 per cent. In the case of barley the deviation in the Transition zone was 37.7 per cent, in the Upper Austral 59.5 per cent, and in the Lower Austral 69.9 per cent.

On the other hand, in the case of corn and cotton it is with the extension of their cultivation northward that the range of fluctuation in the average rate of production is found to increase. In the case of cotton this variation was 25.1 per cent of the average yield per acre in Alabama, 26.3 per cent in Georgia, 35 per cent in Mississippi, 37.9 per cent in South Carolina, 40.4 per cent in Louisiana, 41.3 per cent in North Carolina, 42 per cent in Arkansas, 53 per cent in Texas,§ 54 per cent in Virginia, 55.5 per cent in Florida,* and 75.3 per cent in Tennessee.

Corn does not exhibit the same regularity of progression, owing (1) to the large acreage in the semi-arid portions of Texas, Kansas and Nebraska, where the frequent deficiency of moisture is a disturbing element; (2) to the extent to which special varieties have been adapted to local conditions to meet a want that no other crop can satisfactorily supply, and (3) to the extreme care with which this greatly esteemed product is cultivated in certain sections where its growth is precarious.† Still, the variation in the Upper Austral zone, excluding Kansas and Nebraska,‡ is 46.69 per cent, against 38.46 per cent in the Lower Austral, exclusive of Texas;‡ and if, for the reasons above stated, that of the most northerly tier of states, excluding Maine and Rhode Island,‡ is only 44.57 per cent, it is a significant fact that there is not a state in this belt with as small a variation as Alabama or Florida, and that there is but one that will compare favorably with Georgia, Mississippi, Louisiana or Tennessee.

Investigations show that this law of diminishing constancy is entirely independent of whether the average yield per acre is high or low, and that there is no general correspondence between its operation and the annual variation in the rainfall. The non-uniformity in the fluctuations of various products is attributed by the author to the different proportions of such products grown at a greater or less distance from the natural habitat.

*Abstract of paper read before Section I—Social and Economic Science—of the American Association for the Advancement of Science, August, 1898.

†The transcontinental belt in which Boreal and Austral elements overlap.

§The somewhat wide fluctuation in Texas is due to the extension of cotton planting into regions of uncertain rainfall.

*Not altogether reliable, owing to the non-determinable proportions of the upland and sea-island varieties.

†Although corn is essentially a tropical plant, the highest average yields per acre in this country are those of the New England states. While the high cultivation to which this is due has a steadying effect upon the rate of production from year to year, that rate of production is by no means so uniform as in the states bordering on the Gulf of Mexico, Texas excepted.

‡The reasons for these exclusions are fully stated in the paper from which this brief abstract is taken.

MR. WILSON'S WARNING.

The Hon. William L. Wilson, postmaster-general during Mr. Cleveland's second administration, and now president of Washington and Lee University, delivered an address last week before the Georgia legislature on the subject of "Expansion." He is in full agreement, naturally, with John G. Carlisle, Carl Schurz, Senator Hoar, Bishop Potter, and the other able men who realize fully the impossibility of making American citizens of Asiatics. Mr. Wilson's address ranks well beside the utterances of those gentlemen which we have recently published. On the question of how the Philippines can be governed by the United States, he said:

"In the great Milliken case the supreme court decided that the constitution of this land is the supreme law of our people, in war as in peace, for rulers as for people, and that it covers with the shield of its protection all classes of men, at all times and under all conditions; and in setting aside the civil rights bill the supreme court further said that when a slave had been emancipated, and through a course of benevolent legislation had been freed from the necessary concomitants of slavery there must be a time when he takes his position as a citizen, for whom there can be no special legislation, for his rights are simply the rights of every other citizen—neither more nor less.

"Now we are told that when the military rule ceases there is to be some form of imperialism. I ask you, gentlemen, in what section of what article of our written constitution can you find anything about imperialism? It is an error which is incompatible with that constitution. By its past history it can never be classified into the vocabulary of a free, self-governed people. (Applause).

"The very fundamental idea of the constitution of the United States, and of all our states, is local self-government. Without local self-government there can be no freedom. That government that deals with a man at long range is his master and he is its servant. That government that goes on under his own eyes, administered by his own trustees and servants, that government can be kept his servant and he can remain its master. So if we govern from Washington by any form of imperialism, we are grafting upon our system, or attempting to graft upon our system, some system of government unknown to the fathers, unknown to the constitution, to them that framed it, and utterly incompatible with the fundamental ideas on which that constitution was framed; and this is the beginning of the difficulties of governing such populations."

Another point on which Mr. Wilson was especially competent to deal was