SCIENCE

FRIDAY, JUNE 15, 1888.

THE LAST REPORT of the statistician of the Agricultural Department presents some interesting data for the students of economics in that portion of it which deals with farm-labor and its wages. Curiously enough, the result of the May, 1888, investigation of wages of farm-labor is almost identical with that of three years ago. The changes are very slight, though local differences occur, the averages of the geographical sections or groups of States being changed very little. The average rate per month, where the laborer boards himself, is a few cents lower in the Middle and Western States and in California, and a very little higher in the South and in New England. The highest rates obtained in 1866 in the Northern and Western States. In California and in the South there was a positive advance between that date and 1869. The investigation of 1875, a year or two after the monetary crisis appeared, showed decline in each section, which continued for several years, culminating in 1879, the date of lowest prices of all American farm-products. The decline from 1866 to 1879 amounted to 39 per cent in the Eastern States, 35 in the Middle, 30 in the Western States, and 17 in the Southern States. In California the rate of averages was well sustained, rising at first, but standing in 1879 higher than in 1866.

By a carefully constructed diagram Mr. Dodge shows the course of prices for more than twenty years, and the diagram is a forcible picture of the fearful depression caused by the six years of panic, from which a slow recovery began in 1879. The sharp decline from 1886, except in California, where the highest point after the war is noted in 1869, is a fall from an era of inflation, in which speculative values were all the higher from being stated in a depreciated currency. The present values appear to be on a more natural and stable basis. The rise was coincident with the return to specie payments, and the natural level was reached by a bound as soon as the pressure which depressed was removed. It is curious to note, further, that, at the lowest ebb of wages, rates were higher in the West than in the Middle States, and slightly above the lowest point reached in the Eastern States, because the soil was still cultivated, and crops were grown in their usual quantity, while much of the manufacturing industry was suspended. This Western line of wages would not have dipped so low but for the immigration to the West of Eastern operatives and artisans out of work, seeking employment and future homes.

There is a sufficiency of farm-labor in this country, as a whole, with a comparatively even balance between the geographical divisions. There are localities in perhaps every State where scarcity exists, and others having a superabundance. There is in some places a scarcity of agricultural labor caused by demand at higher wages for labor in some specific local industry. There is reported now, as always heretofore, a tendency to exercise distinctive preferences, and encourage peculiar aptitudes, for professions and avocations outside of agriculture, generally leading away from the country to the town or city. A temporary disturbance of the relation between demand and supply is found in some localities as a result of a somewhat rapid change in the character of the rural industries pursued. Where general farming has been partly replaced by an extension of pastoral industry, the effect has been to reduce the demand for labor; but in other cases there is a notable increase in gardening and fruit-growing, which occasion a large increase in the labor required for the cultivation of a given area. The continued development of truck-farming, near many of the navigable waters and some of the railroad-lines of the South, affords a conspicuous example of the latter class of changes.

A considerable number of reports from the more Atlantic coast States, and from some farther West, mention the migration of laborers as a cause of a noticeable reduction in the supply of labor. Usually the movement is simply a part of the general westward drift of population, but there are some movements of a more limited and special character. In Mississippi, for example, the reports from certain counties mention the departure of many colored laborers to the richer lands of the Mississippi bottoms or of the Yazoo delta, and a similar movement from a thin upland soil to river-bottom lands is also mentioned by some correspondents in Louisiana and Arkansas. Some reports from Virginia and North Carolina mention the departure of many colored people for the North. Others from the same and other States refer to a movement southward. Some Alabama reports mention a movement of colored laborers to settle on public land in that State as homesteaders. One North Carolina report, that from Cabarrus County, states that forty colored men had left for California, but the labor-supply in the neighborhood from which they had gone was still sufficient. In some localities, however, a considerable deficiency is reported as a result of such migrations.

THE CONTEST in the New York City Board of Education has resulted in the re-election of Mr. Jasper as superintendent by a vote of twelve to nine; and the political ring whose servant he is, is jubilant. It is safe to say, however, that the triumph is but a temporary one: for public opinion is arousing, and a public education society has been formed for the purpose of carrying on the agitation. The leading educators of the city, representative clergymen and lawyers, and not a few of the would-be progressive public-school teachers, met on Saturday last, and laid the foundations for the new society. It will, if we understand aright, take up the task of educating public opinion, and possibly will demand the appointment of a commission to investigate the schools and report a plan or plans for their improvement. This would be an excellent step, more especially as the present mayor enjoys the fullest confidence of the community, and could be safely trusted to appoint a commission that would do its work thoroughly and well. An attempt should also be made to displace the ringsters whose terms expire this year with better men. Four of the seven whose terms expire in December should on no account be re-appointed. The importance of this is well understood, and already representative citizens, like Dr. Mary Putnam Jacobi and Col. R. T. Auchmuty, are suggested for the vacancies.

The Springfield, Mass., *Republican*, in commenting on the condition of affairs, says that "the re-election of John Jasper as superintendent of the public schools of New York was a foregone conclusion. The Board of Education was as much on trial as the superintendent himself. The board exercises many of the prerogatives which in other cities belong to the superintendent, and it could not

be expected that it would pass a vote morally condemning its own acts. In the next place, the opposition, or, more properly speaking, the true friends of education in New York, began their attack by first selecting a candidate whose reputation, experience, and force of character were not equal to the tremendous work of reforming the present vicious system of instruction. The large results of the investigation of Mr. Jasper's records will appear next year, when he will be confronted by a rival candidate as well as his own record. The public has now been informed of the sad situation, and will be prepared for serious work when the next two years close and another election of superintendent takes place. When Mr. Kiddle withdrew, and Mr. Jasper took the New York schools in hand, the change was noticed at once. The teachers were all put in the position of wheels contributing to a nicety to the general movement, and the product was a machine-made pupil. The perfect examination was very much on a par with Showman Forepaugh's trick-elephant. If one teacher undertook to feed the starved minds of the little ones, then there was trouble with the machine, and the teacher was subdued." Every word of this is true, and is in full accord with the position that *Science* has taken in this important matter. If the Public Education Society does its full duty, the situation will be materially altered before another election takes place.

THE LONDON PUBLISHERS and printers are getting more and more excited over the provision of the Chace international copyright bill, which requires a foreign book copyrighted in this country to be printed from types set up in the United States. The printing and allied trades section of the London Chamber of Commerce has sent a resolution to the Chamber of Commerce, asking the government to obtain by diplomatic means the withdrawal of the objectionable provision, and, if this is not done, demanding that a similar law be passed in England. What the English publishers and printers desire is an opportunity to make all books written or compiled in Great Britain and sold in the American markets. That is something that the Congress of the United States will never agree to, if the passage of an international copyright act is postponed a quarter of a century. England may prevent books printed in America from being sold in Great Britain, but will never succeed in dictating in what shape a law shall be passed by the Congress of the United States until the former raises a generation of abler diplomatists than she has lately sent abroad.

AN ITEM PUBLISHED in the Washington papers last Saturday, entitled 'The Army Ahead,' in which it is represented that competitive tests of the 'indications' work of the Signal Office, to determine the relative merits of military and civilian officers in the performance of this work, had been made, is likely to mislead any one who has not read the description of the present condition of affairs in the Signal Office, published in the last issue of *Science*. The predictions for February were made by Lieutenant Dunwoody, and those for March by Prof. Cleveland Abbe. The percentages of verifications for each month have been computed by Professor Marvin, who found the record as follows: Professor Abbe, indications 75.42 per cent, storm-signals 62.50 per cent, cold-wave signals 53.99 per cent; Lieutenant Dunwoody, indications 80.55 per cent, storm-signals 89.29 per cent, cold-wave signals 86.11 per cent. It should be remembered, that years ago, when the weather reports became most popular and there were nothing but compliments for its predictions, Professor Abbe, then in thorough practice, prepared the indications for a long time. Of late he has been engaged in an entirely different line of scientific work, and it was not to be expected that he would be as successful in preparing indications as an officer who had lately been engaged in that service. General Greely's purpose in putting Professor Abbe upon this duty at all was to train civilians for it in case Congress, as seemed more than probable, should transfer the weather bureau to a civil department.

THE CRENITIC HYPOTHESIS AND MOUNTAIN-BUILDING.

THE facts derived from the study of metamorphic rocks and volcanic phenomena make it evident that there are two types of motion which take place in the deeper-buried materials of the earth's crust. One of these classes of movements occurs when volcanic ejecta creep horizontally towards the vent, or when the materials which afford the support of mountain-arches undergo massive movements towards the base of such folds in the rocks. In these cases of horizontal movements we have translations of extensive bodies of matter for considerable distances. The other class of movements taking place in the crust are in a vertical direction. They are brought up in part by the action of water, and in part by the action of igneous forces. The operation of these agents leads to a very extensive transfer of material in a vertical path, from the deeper-buried to the more superficial strata. I propose in the following pages to consider the general effect of this upward movement of matter upon mountain-building.

The simple inspection of most mountain-built districts will show the observer that there has been a very extensive movement of materials from lower to higher levels in the crust in such areas. Taking a considerable surface of mountainous country, where by chance the bed-rocks are exposed to view, we almost always find in such regions numerous veins and dikes. Thus, in the anticlinal districts of New England, especially where those portions of the surface are exposed along the seashore, we are often able to ascertain, that, on the path traversed by a straight line a mile in length, the addition to the material in the more superficial rocks has been sufficient to produce a considerable extension of their area. In some sections having this length, I have been able to prove that the increase in the horizontal section, due to the introduction of the materials derived from below, amounts to as much as from ten to twenty per cent of the original area; or, in other words, on a line a mile in length, the dikes and veins occupy from one-tenth to one-fifth of the distance. Besides the distinct intrusions of matter in the form of dikes and veins, there have in many instances been large contributions to the more elevated parts of the crust through the interstitial contributions of crystalline material. Thus in some of our highly metamorphosed rocks, where the materials have assumed the crystalline structure, a progressive growth of the hornblendic and other aggregations has been observed; so that, besides the contributions of matter which we may reckon from a study of dikes and veins, there is often a large but incomputable element of crystalline growth, serving to extend the rocks, which is not readily to be taken into account.

The immediate causes of this transfer of material from the deeper-lying to the more superficial parts of the earth's crust are now tolerably well known. In large measure it is due to the peculiar effect of temperature upon the water which was enclosed in the sedimentary rocks at the time of their formation, or which may have penetrated into them from the surface. The process of burial beneath sedimentary formed accumulations acts in all cases to lift the temperature of all the rocks which are subjected to such covering. Where these rocks contain the waters of deposition, they are likely in time to be brought to a high degree of heat. The temperature to which they attain, and the pressure to which they are subjected, enable them to dissolve a large share of the materials with which they come in contact. Moving upward in the channels which may be opened by chance riftings of the superimposed strata, these waters, deprived of their power to retain the materials in solution by the loss of temperature in their upward journey, and the relinquishment of pressure which comes about at the same time, lay down deposits in the upper portions of the crust. In a similar manner the descending pluvial waters obtain in the deeper parts of the crust a store of dissolved materials, which, on their re-ascent, is likewise deposited in the higher rocks. Thus the movements of water below the drainage-level of the country inevitably operate to bring from below and deposit in the upper parts of the crust large amounts of mineral matter.

The nature of the forces which urge dike-stones from the deeper to the more elevated parts of the crust are not so clear as those involved in the formation of veins. It seems not unlikely that it is to