THE SILK INDUSTRY IN THE UNITED STATES.

Silk-manufacture in the United States. Compiled by WILLIAM C. WYCKOFF, special agent of the tenth census.

UNDER the above title, Mr. W. C. Wyckoff has published a volume containing his report as special agent of the census of 1880, the tenth annual report of the Silk association of America, and a directory of silk-manufacturers. The first of these reports is reprinted on account of the very small edition of the bulletin issued by the census office, and deserves more notice than it has received, on account of its admirable historical account of the numerous attempts at silk-culture in this country, and of the rise of silk-manufacture. The interest in silk-culture has steadily grown of late years, while the interest in silk-manufacture was scarcely more marked during the early struggles to establish the industry than at this present time of tariff-reform agitation.

In the work before us, the first introduction of silk-culture into America is traced back to the Spanish conquest of Mexico. Mulberry-trees were planted near the city of Mexico by order of Cortes shortly after 1522; and in 1531 a quarter of an ounce of eggs was sent on public account from Spain to Francisco de Santa Cruz, a citizen of Mexico. The eggs were reared by Auditor Diego Delgadillo with the best of success, and two ounces were returned by him to Francisco. He was accused, however, of selling the remainder of the eggs, which were the property of the crown, to others for sixty dollars an ounce, was tried and convicted. This carries the beginning of silk-culture in America nearly a century back of previous records. The industry flourished for a while in Mexico, supplying the demands of the people, and even giving rise to a certain amount of export to Peru; but, by the end of the sixteenth century, few traces of its existence were left.

Early in the seventeenth century James I. of England, jealous of the growing prosperity of silk-culture in France, resolved upon its introduction into England and the American colonies. In 1619, after one disastrous attempt had been made ten years previous, eggs were received in Virginia from the Royal gardens at Oatland; and the settlers were enjoined, by promises of aid for diligence, and threats of punishment for negligence, to undertake the culture of the worms. Meanwhile the cultivation of tobacco was discouraged in every possible way. Nevertheless, the success of the silk-industry was but slight. Some silk was grown, as it was quoted among the market-prices of commodities grown in Virginia at that time; but, in spite of all encouragement, the industry did not flourish. Calculations were made whereby it was shown that the labor of slaves employed in growing silk would produce about twice as much value as in planting sugar and tobacco; and one writer even advised the sending of all the paupers and small criminals of the old country to the colonies to engage in the culture.

In South Carolina but little more was done; and in the twenty-five years of greatest production — between 1731 and 1755 — only 251 pounds were exported. Georgia did somewhat better. In 1735 a plot of ground near Savannah was planted with mulberries and vines at the public expense. In 1744 a filature was built and bounties were offered, and from 1750 to 1772 considerable amounts of silk were exported. Then came the war of the revolution, and mention of silk-culture for a time ceases.

Mr. Wyckoff then traces the early attempts to introduce the culture into New England. In each case the culture is traced from its rise in any particular colony to its extinction, and the various causes for failure are discussed. Some new facts are added to this portion of the work; but in the main it substantially coincides with other accounts, notably with Dr. Brockett's 'Silk-industry in America' (1876), — a not surprising fact, since both authors relied upon the same library. Nevertheless, this portion of the work, covering the most interesting periods in the history of the industry in America, is thoroughly concise, and full of valuable suggestions. The growth of the industry is followed, and shown to have been steady after the revolution, with no encouragement in the way of premiums or bounties. Connecticut became the chief seat of production, and the silk was consumed mainly in the manufacture of sewing-silk. This part of the history — during the close of the last and the beginning of the present century — shows pretty plainly, that, without interference or discriminating legislation, silk-culture and silk-manufacture would develop co-ordinately. During the third and fourth decades of the present century the general interest in the subject increased; and the encouragement given by the various states and by Congress, until the Morus multicaulis furore undid them all in 1839, transcended any similar efforts since made. In 1826 we find that three-fourths of the families in Mansfield were engaged in raising silk, and made annually, per family, from five to fifty pounds, or even a hundred pounds,

of 'raw silk.' The largest amount of raw silk produced in this country in any one year is given as thirty thousand pounds, in 1841.

There is a tendency, on Mr. Wyckoff's part, to intensify the dark side of silk-culture, and to depreciate the quantity and quality of silk produced, — a tendency that is natural, and doubtless unconscious, in an agent of an association of manufacturers. In most cases he makes the amount of silk raised much smaller than given by common report: but he does so in some instances by assuming that the term 'raw silk,' or 'raw-silk balls,' in older works and reports, meant cocoons, or that there was 'neglect in discriminating between cocoons and raw silk;' also by calculating that from ten to fourteen pounds of cocoons are necessary to make a pound of reeled silk. He by no means makes it clear that the term 'raw-silk balls' really meant cocoons; as it might apply to the twisted hanks of reeled silk, and the term 'cocoons' was in use at that time. It is also certainly not justifiable to assume that the cocoons were necessarily fresh, as they are not thus handled and marketed. This he does, however, in his estimates (p. 24). Four pounds of choked cocoons to a pound of reeled silk is a liberal estimate, and would give us in 1766, when twenty thousand pounds of cocoons were produced, five thousand pounds of 'raw silk;' while the maximum amount Mr. Wyckoff allows in any one year prior to 1772 is 'rarely exceeding a thousand pounds.' While sometimes misleading, therefore, this tendency to look on the dark side of silk-production has resulted in demonstrating some exaggeration and mis-statement on the part of earlier writers; and the establishment of the truth or falsity of such statements, which have again and again been put forth, is one of the most meritorious features of the work. The most striking case in point is where (p. 25) the oft-quoted statement as to the export of ten thousand pounds of raw silk in 1759 is pretty conclusively shown to have been based upon such confusion of terms and mis-statements as above indicated.

The summing-up of the present condition (1880) of silk-culture in the United States is worthy of quotation: —

"An inquiry was attempted by the writer to ascertain the amount of raw silk raised in the United States during the census year ending June 30, 1880. It was soon determined that the expense of making such an investigation thoroughly would be more than the result could be worth. The only instances of the use of native silk in manufacture were at Williamsburg, Kan., and at Salt Lake City, Utah. The latter experiment proved financially a failure, the raw silk costing much more than the Asiatic product. It may however be stated in a general way, without pretension to accuracy, that the amount of reeled silk produced in Utah territory during the year was less than a thousand pounds; the amount in Kansas was less than five hundred pounds, and the product in no other state was more than half as much. Missouri and North Carolina probably came next in amount of cocoons raised, and after those states Pennsylvania and New Jersey, the quantities produced there and in scattered localities throughout the country being inconsiderable."

With the exception of the penchant already alluded to, in favor of the manufacturing as against the productive part of the silk-industry, the author has done his work so well that it will remain as the best monograph on the subject we possess. It is, in fact, a model report, the material for which has been gathered with care and comprehensiveness, and put together in such compact and concise form that it will serve as a cyclopaedia for all future reference, and render it extremely difficult for future writers to add any thing of consequence.

We notice but one clerical error of any importance. 'Julius Stanislaus,' in the list of authors (p. 39), should be 'Stanislas Julien.' He was a member of the French institute, and professor of Chinese literature in the College of France.

No one can read this report without feeling that the silk-manufacture of the country has been built up to its present importance by our protective policy; and at first blush this would seem to be a very strong argument in favor of that policy. But it has at the same time had the effect to throttle and destroy the production and concomitant reeling of silk. The one industry is protected at the expense of the other. 'Raw silk,' as applied in the trade, is a misnomer: it should apply to the simple fibre upon the cocoon, whereas it really applies to the reeled silk, which is as much a manufactured article as any woven or sewing goods, having gone through an elaborate process by means of special skill and complicated machinery. On its successful establishment the silk-producing industry may be said to depend. Nothing is more clearly demonstrated by Mr. Wyckoff's report than that the chief cause of failure in this last, next to no reeling at all, has been the bad reeling of domestic silk. There was never any difficulty in rearing the worms, or in getting silk of the best quality; and, when good reeling could be had, 'native silk was found to be of superior quality and strength' (p. 35). Why, therefore, it will be asked, should one kind of manufacture be protected from foreign competition, and not the other? If protection is beneficial to the people in the

one case, why not in the other? With a native food-plant (Maclura aurantiaca) now known to be available over most of our domain, with a rapidly-increasing population, with increasing means of communication, and with the settlement of sections of the country that by climate are pre-eminently adapted to silk-culture, the present period has advantages for this culture possessed at no other period, and the question is pertinent. We do not propose to introduce a homily on free trade; but we think that the chief answer that can be given to the question is, that our silk-manufactures are established, and give employment to a large number of operatives, while silk-culture as an industry amounts to so little that there is nothing to protect. The same could have been said of silk-manufacture while it was struggling for establishment, and means little more than that we must keep up a discriminating policy, simply because we have begun it; and the more powerful and wealthy the manufacturing interest becomes, the more certain will it be kept up. This is the secret, in a nutshell, of the failure of silk-culture at the present time; and the prospect for what might otherwise become a valuable productive industry is certainly gloomy.

SCRIBNER'S WHERE DID LIFE BEGIN?

Where did life begin? a brief inquiry as to the probable place of beginning and the natural courses of migration therefrom of the flora and fauna of the earth. By G. HILTON SCRIBNER. New York, *Charles Scribner's Sons*, 1883. 6+64 p. 12°.

THIS little monograph is a full summary and straightforward statement of the principal grounds of the theory of the arctic origin of the plants and animals of the northern hemisphere. These grounds, in more condensed statement, are as follows: on any planet, organic life would first appear in the region first suited for its reception. On a planet cooling from an incandescent state, the polar regions would first acquire a habitable temperature, both because their deficiency of solar heat would accelerate cooling, — that deficiency being increased by polar flattening, which renders the sun's rays more oblique, and increases the radiating surface of the polar sides, — and because, underneath the polar sides, there is less matter to be cooled than underneath the equator. On our earth the polar regions are now too cold for life, and hence they have passed through the life-sustaining stage; and this was while more equatorial regions remained too hot. As the life-sustaining isothermals moved equatorially, animals and plants migrated correspondingly. The progress of climatic change was not more favorable to this faunal and floral migration than were the southward bottom flow of water in the general oceanic circulation, and the general meridional trend of the continental and oceanic configuration, or the prevailing surface-movement in the atmospheric circulation. All these conditions oppose transmeridional migrations. Confirmatory of these deductions are numerous facts of observation, — such as similarity of the fauna and flora at all parts of the same parallel of latitude; the remains of tropical and subtropical animals and plants in arctic regions; the degenerate condition of certain arctic species, as whales, seals, and others; and the fundamental affinities of different tribes of plants and animals which testify to a common origin.

Undoubtedly some of these considerations are entirely valid, and confer upon the theory a claim to sober consideration, not to mention the authority of names previously subscribed to it. What a hesitating believer would like to know further, is, whether the inferior polar radius of the earth would really accelerate or retard polar cooling, and whether the circulations of the sea and atmosphere have been such as to promote the migrations of plants and animals from high polar to equatorial latitudes. The deductions based on progress of planetary cooling are plausible: but the queries arise, whether circulations did not exist in the fluid planet before incrustation as well as in the fluids existing after incrustation; and whether such circulation must not have maintained polar and equatorial surface temperatures so nearly equal as to permit nearly simultaneous incrustation in all latitudes; and then, whether, after general incrustation, the crustal arrest of radiation must not have speedily diminished subcrustal influence to such an extent that climate depended chiefly on solar radiation, since less than half a mile of crust would fail to conduct sufficient heat to affect surface temperature more than a small fraction of a degree. Then, on the side of inductive data, we have to consider whether the secular southward progress of identical climatic conditions would not be incompatible with that continuity of sedimentary conditions, which, especially in North America, has been traced from the thirty-fifth to the sixty-fifth degree of latitude; and whether a similar progress of identical faunal conditions would not introduce a progressive change in the correlation of life to the age of the strata, leaving the same types in older strata northward, and newer strata southward, while observation testifies that the same Hamilton types,