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,

for instance, stretch from Missouri to Arctic America, and are enclosed in sediments of similar character throughout these limits. Aside from defects of particular arguments, and aside from any weight attributable to this essay, the question is one which will undoubtedly provoke competent and deliberate discussion. Mr. Scribner's monograph is well written, with some local diffuseness, and an occasional sentence of intolerable length, but, on the whole, a timely, suggestive, and pleasant little volume.

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

Geological survey.

Rocky Mountain division. — Upon the organization of the survey, the area of the United States was divided into eight districts, in order that the progress of the work might be systematically facilitated. Of the four western districts, the 'Rocky Mountain district' includes the state of Colorado and the territories of New Mexico, Wyoming, and Montana.

Geologic work. — Colorado has been the principal field of geologic activity in the district; and the work has been carried on under the supervision of Mr. S. F. Emmons, who is the geologist in charge, with headquarters at Denver. The mining-geology of the state has been made the subject of special study, and the investigations have been confined mainly to questions of direct economic importance. Prior to 1883 the work done was principally in the Leadville and Ten-mile regions. Last season an examination of the Silver Cliff mining-district was undertaken. The geologic work was begun by Mr. Whitman Cross about the 1st of July, and was carried on through the summer, and completed in September. The topographic work had been previously completed. The preparation of the geologic map was intrusted to Messrs. Cross and Chapman, assistant geologists. Messrs. Jacob and Eakins were detailed to report on the mines and ore-deposits, under the personal supervision of Mr. Emmons. Mr. S. S. Sackett was engaged in gathering statistics as to the reduction of the ores of the district, and secured material for a chapter on the mills and reduction-works of the district.

The report on this mining-district will be of especial value, as the Silver Cliff is a mining-camp of abortive processes, a true history of which may well serve as a warning, by pointing out the errors, which there led to the failures in mining and in the reduction of the ores.

From the Silver Cliff district a short trip was made to the Sangre de Christo range, which lies on the opposite side of the valley. This was made with a view to determine the geologic relations of the Silver Cliff ore-deposits to the rocks of the range. Some field-work was also done by Mr. Cross on the mesozoic rocks exposed in the vicinity of Golden and of Morrison. In the Denver coal-basin progress was somewhat retarded by the absence of Mr. Karl, who has charge of the topographic survey of the region. Although temporarily suspended during the summer, work in this basin can be carried forward during the winter months, when the snow causes the abandonment of the field in the mountainous sections of the state. The map of the basin is to include some thirty square miles, on a scale of one mile to one inch. Information on the subject of the artesian wells in this basin is being secured, and will be embodied in the report. Voluminous rock-collections were made during the season, especially in the Silver Cliff district; and a special trip was made to Buffalo Peaks for the collection of typical specimens of hypersthene-andesite.

Besides the field-work, considerable office-work was accomplished. The notes on the Ten-mile district were worked up, and a geological map and sections of the area were made. Manuscript for the following monographs by the 'Rocky Mountian division' are in advanced stages of preparation: viz., 1°, Geology and mining industry of Leadville, by S. F. Emmons (an abstract of this paper appeared in the second annual report of the survey); 2°, Geology and mining industry of Ten mile district; 3°, Geology and mining industry of the Silver Creek district; 4°, The basaltic mesas near Golden, and their relation to the contiguous tertiary and cretaceous beds. During the season the bulletin on hypersthene-andesite, by Mr. Whitman Cross of this division, was published.

Laboratory work. — The laboratory at Denver is in charge of Mr. W. F. Hillebrand, chemist, who has been busy with the chemical and lithological examination of the rocks collected in the district, and on the ores from the various mining-districts. Some of the details of his work have already been given in *Science*. Mr. Whitman Cross has carried on the microscopical examination of the numerous thin rock-sections made of the rocks collected in the district.

Topographic work. — Mr. Anton Karl has been carrying on the topographic surveys in the district, and during the season of 1883 was in the Elk Mountains, mapping the Gunnison mining-region. His triangulation was based on Snow Mass and West Elk Mountains, two points located by the Hayden survey. These were occupied, and a system of triangulation was extended from them over the whole area surveyed. The principal mines in the Ruby basin, lying between Mount Owen and Irwin Peak, were all located, as well as Anthracite Mountain and the property of the Denver and South Park coal company. Topographical data were obtained for