Lüsebrink on one side and Duval, van Beneden and myself on the other, of which debates the object was to make out in how far the material of the proliferating placenta should be looked upon as maternal and in how far as embryonic, trophoblastic tissue.

These debates will no doubt, in the course of time, as the number of carefully observed cases increases, lead to a unanimous interpretation. As it was, I have myself, for sheer diffidence of attributing too prominent a part to trophoblastic proliferation (of which I was, nevertheless, together with Duval, the first advocate), in one case stopped short of the real solution, and have for the hedgehog restricted the extent of the trophoblast more than was necessary. Since then I have corrected this in a doctor dissertation of one of my pupils (Resink, 1903), but there is no doubt that I am myself thus responsible for a certain amount of vagueness and misrepresentation which has prevailed in the application of the term trophoblast to different placentas, more particularly of man and the monkeys, where the question arose in how far certain syncytial tissues should be looked upon as maternal or as embryonic. Even for pathological anatomy this proved to be a momentous question in so far as the deciduoma malignum, if traced to remains of trophoblast cells, would be very different from other deciduomæ, that found their origin in maternal tissue.

Now that the placentation of *Tarsius, Tupaja, Sorex, Vespertilio, Cercocebus, Talpa, Galeopithecus, Sciurus, Lepus,* a. o., has been more carefully examined (trophoblastic proliferation having been figured by Selenka as early as 1887, for one of the Didelphia [*Opossum*]), divergence of opinion will in a few years hence have been replaced by unanimity also on this head.

And then the application of the name trophoblast to those placental elements that arise from the embryonic layer originally designated by that name will be in no way confusing, but will, on the contrary, contribute to keep before our eyes the intimate relation between the facts as they take place under our eyes and their phylogenetic origin.

With perfect justification Strahl has protested (Hertwig's 'Handbuch der Entwickelungslehre der Wirbelthiere,' I., 2, p. 311) against a misapplication of the terminology, which I have attempted once more to explain in this article, when authors who have insufficiently studied the subject even go so far as to speak of a *maternal* trophoblast beside the embryonic!

I hope that this paper may henceforth render misinterpretations such as are discussed in it impossible.

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SCIENTIFIC BOOKS.

Geographic Influences in American History. By Albert Perry Brigham, Professor of Geology in Colgate University. Boston, Ginn & Co. 1903. Pp. 365.

Professor Albert Perry Brigham, of Colgate University, has made a notable contribution to American geographical literature in his book, 'Geographic Influences in American History,' published by Ginn and Co. The divisions of the book are mainly physiographic, but the author has not allowed this subject undue prominence.

Chapter one is entitled 'The Eastern Gateway of the United States.' The central idea is the development and importance of the Hudson-Mohawk valley—its physiographic origin and its influence upon American history. Its importance in the Revolution and the war of 1812, and the successive waves of immigration which passed through it and left their record in the 'successive layers of geographic names' are well brought out. The interdependence of the valley and the cities which have grown up along it and the conditions of growth of the metropolis at its mouth are discussed.

'Shore Line and Hill Top in New England' is the title of chapter two. A mountain foundation covered with drift is described as the physiographic type of the division. The influence of this structure upon life, upon agriculture and the diversion of the streams, thus causing the waterfalls so prolific of power, the resulting coast line and its result upon commerce are among the topics taken up. The history of New England, which has been directed to some extent by surface and climate, is discussed, but the author does not lose his balance. 'That environment influences character,' he says in summing up the influences of climate and physical features, 'need not be asserted; but one can not be sure in weighing its influences.' The coloring of the literature of New England by geographic influences is shown by selections from Emerson, Whittier and Thoreau.

The 'Appalachian Barrier' is discussed in the third chapter. The region of mountains, plateau and valley which stretches as a unit from New York to Alabama, together with its fringe of Piedmont Plateau and coastal plain, is described in popular language. The unity that such a barrier enforced upon the colonists and its effects upon the Revolution are the principal themes of the chapter. The development of routes across this barrier, first by trails and later by railroads, is described.

Chapter four has the title, 'The Great Lakes and American Commerce.' The Great Lakes, their probable origin, their geographical features and their historical and industrial influences are prominent topics. Duluth, Milwaukee, Chicago, Cleveland and Buffalo are accounted for on geographic principles. Niagara, past, present and future, is discussed. In discussing this great continental waterway from Buffalo to Duluth the fact, perhaps not generally appreciated, is emphasized that more tonnage passes through the 'Soo' than through the Suez canal, and that the commerce of Cleveland at times rivals that of Liverpool.

Chapter five deals with the prairie states, taking Illinois and Iowa as types. The introductory pages describe the visit of the Spaniard on the south and the invasion of the French trapper and trader on the north. In following the latter an idea is given of the drainage systems which provided paths for them. The topography of Ohio, Indiana and Illinois is contrasted with that of New England. Both are glaciated regions, but the former has received the ice action on a fairly level surface, so that the glacial detritus is more evenly spread, the finer materials of ice action have not been swept away and the level, fertile prairies are the result. The author takes up the settlement of this district, the routes of immigration, the development of its social and financial problems and the location and growth of its cities.

'Cotton, rice and cane' is the title of the chapter which deals with the group of southern states. The coastal plain with its level surface and sluggish tidal rivers is described as the typical structure of most of the states of this division. Virginia, North Carolina, Georgia and Alabama have in addition considerable area in the Piedmont Plateau, while Florida has a structure rather peculiar to itself. In South Carolina three zones of life and industry are described, each a good example of 'earth control.' Sea Island cotton, rice and truck farming are characteristic of the coast lowlands and islands. Here is the 'black belt.' Between this and the plateau is a belt of sandy country whose inhabitants, the 'sand hillers,' share the poverty of the soil. In the northwestern corner of the state is the plateau country whose poorer soil and cooler climate made slavery less profitable, and the whites are more numerous than the colored people.

North Carolina, while rich in land and with a genial climate, drew her population from Virginia and South Carolina. The sand reefs on the coast and lack of harbors cut her off from the sea. Florida is described as altogether coastal plain, and the most youthful of the states. The lack of water power and coal and the scarcity of most minerals would seem to justify the author's prophecy that the country will not give way to the town to the same extent as in most states.

The evolution of the plantation, the growth of the slave system and the present social and

industrial development are discussed from the standpoint of geographic principles.

The civil war is taken up from the author's standpoint in chapter seven. The rivers, mountains and topographic features that had a bearing on the conduct of the war are first considered. Then follows an analysis of the geographic influences upon the three great campaigns of the war: the opening of the Mississippi, the operations around Chattanooga and the Virginia campaign. Although, perhaps, a digression from the general plan of the book, this chapter is exceedingly interesting and indicates the possibilities of a line of research which has been strangely neglected by historians.

The arid regions of the west are described in chapter eight. After a discussion of the varied physiography of these regions and the causes which deny to them their share of rain, the author presents an interesting example of geographical politics.

During the early part of the decade from 1885 to 1895 there was a slight increase of rain in this region which coincided with the rush of settlers into western Kansas and Nebraska. Later the normal dry seasons followed and brought disaster. The people, pressed for ready money, accepted populistic doctrines and the movement grew out of 'the failure of a frontier population properly to adjust itself to geographic conditions.'

The problems of irrigation constitute a considerable portion of this and the succeeding chapter. The origin of irrigation, its possible effect upon society, its intensive agriculture, its present status and its regulation and distribution are well brought out. One leaves the subject with a lively impression of this problem which most of us not immediately concerned do not fully appreciate.

Chapter nine treats of the mountain and plateau states under the title, 'Mountain, Mine and Forest.' Colorado is described as the typical western state. After briefly treating of the physiography, the mining interests are taken up in some detail. The origin of veins and lodes, the influences of mine development upon society and the location and growth of Denver, Pueblo, Leadville and other towns are described. After describing their physiography, the problem of irrigation in Arizona, Wyoming, Idaho and Nebraska is discussed. The influence and preservation of forest reserves in these states are taken up.

'From the Golden Gate to Puget Sound' is the title of chapter ten. The three Pacific states are described as having a common backbone in the Sierras, a similar depression to the west of these and a common range fronting the sea. The geological development which produced the present surface and made possible the mineral wealth is discussed in a readable manner. To this land the Spaniard came, but his occupation gave only a 'sentimental background' to its history. The Mexican occupation left scarcely more impression; the Yankee traders bought their hides, took them to New England, carried them back and sold them as shoes in California ports. The author sketches the discovery of gold, the rush of the 'forty-niners' and the subsequent steps to the admission of California as a state. Coming down to 1900, it is interesting and significant to learn that the agricultural output of the state exceeds over threefold the value of its mineral product. The location of cities and the relation of the Isthmian Canal to the Pacific coast are among the topics considered.

Oregon and Washington are discussed together in history, topography and products. Their settlement against the efforts of the Hudson Bay Company is sketched. Their coal fields and forests are described and their commercial possibilties are prophesied in these words: 'He need be no seer who sees cities like those of the Atlantic standing under the western sun.'

The eleventh chapter deals with 'Geography and American Destiny.' The author finds in American history one geographic fact of overshadowing importance: 'A wide ocean separated an advanced civilization and a relatively dense population from a wide, rich and almost unoccupied continent.' The growth of the nation by conquest and purchase, its development along geographic lines and its advent into more active world relations in 1898 are described. The dominant topic of the chap-

ter is American unity. Intercommunication, common business interests and common national ideals are named as factors contributing to this unity.

The final chapter treats of 'Governmental Study of our Domain.' It contains a description of the work of the Geological Survey, Coast Survey, Fish Commission, Department of Agriculture and other departments of governmental activity.

'Geographic Influences' is almost a pioneer in its line. Among the geographic influences the author places the greatest emphasis upon physiography, but the treatment is not overbalanced. A quality which can hardly be shown in a review is the vigorous, attractive style. The author presents a wealth of facts without a trace of 'statistical' manner. The illustrations are well selected and several maps are included in the work. The book should have a good circulation among those readers who are interested in American history. It will also appeal strongly to an increasing number of students who are considering the relations of the earth sciences to the politico-historical sciences.

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DISCUSSION AND CORRESPONDENCE.

THE METRIC SYSTEM.

TO THE EDITOR OF SCIENCE: I feel that I must congratulate your readers on the review of 'The Metric Fallacy,' published in your issue for August 5, from the pen of Professor W. Le Conte Stevens. Passing by the charges of partisanship and intolerance for the moment, as of no real importance, the review exhibits a comprehension of the subject which is rare—I might almost say unique—among metric advocates. My purpose in writing this letter is to point out that Professor Stevens's admissions are of far greater importance than he seems to suspect, and I trust you will find a place for it—not as a reply to the review, nor as a defence of the book, but as a continuation of an important discussion.

As I have pointed out in a special chapter of 'The Metric Fallacy' (The Pro Metric Argument), the metric advocates have based their case upon the belief that the change to their system is an easy one. This belief is the chief burden of the pro-metric statements made before the house committee on coinage, weights and measures, of the fifty-seventh congress, and it was largely through its reiteration that the favorable report of that committee was obtained. In the above-named chapter will be found quotations from the statements made by a dozen metric advocates before that committee in which the longest period named for the change is five years. I can, however, ask you for space to repeat but one of these—the gem of the whole collection—which came from Lord Kelvin (italics mine):

> I believe that *in a fortnight* people would become so accustomed to the perfect simplicity and easy working of the metrical system, that they will feel that instead of its being a labor to pass from one system to the other, *it will be less than no labor.*

This opinion, I should add, was repeated with approval at the great discussion of the American Society of Mechanical Engineers in 1902.

Through a clipping bureau, I have received from Great Britain hundreds of newspaper clippings pertaining to this agitation in that country, and the case there, as here, is based upon this assumption.

It would, indeed, be superfluous to mention this contention of the metric advocates, except to point out that Professor Stevens is so far in advance of his associates as to frankly tell us that 'reasonably complete assimilation will take several generations' and that 'none of us of to-day will live to see anything better than good progress on the part of the general public in getting accustomed to the new standards and in losing devotion to the old ones.'

Among those whose opinions as to the shortness of the transition period are given in the chapter on 'The Pro Metric Argument,' are: Elihu Thompson, Harvey W. Wiley, S. W. Stratton, Simon Newcomb and Lord Kelvin. Professor Stevens seems to think I have not treated these opinions with due respect, but in view of the above quotations from his review it is hard to see wherein he respects them more than I do. He plainly regards