interest; but the impression left by a careful perusal of them is not altogether satisfactory. In some cases a large amount of data has been obtained, as in the feeding experiment; but the results are presented without any adequate discussion, — a too prevalent habit among our stations. Others of the experiments would be more properly called observations, and, while of value, scarcely require the apparatus of an experiment-station for their making; while still others seem to lead to no definite end. While much has been done, and in various directions, we fail to find in the report any exhaustive investigation of any subject, such as it is the peculiar province of the experiment-station to undertake. The tendency appears to have been to select those simpler forms of experiment which give an answer in gross to some question of present interest in practice, rather than to attempt to reduce the question to its elements and elucidate the action of the various factors which enter into the answer.

PERHAPS NO ONE is better fitted by training and experience to discuss intelligently the problem of municipal government in the United States than Mr. Seth Low of Brooklyn, and his address on this topic before the Historical and political science association of Cornell university is very full of information and suggestion. It has needed neither de Tocqueville's warning nor the data given in the current issue of the *Andover review* to impress upon us the fact that this is the age of great cities, and that it is in the cities that republican institutions will be put to the severest test. Mr. Low points out that the task of administering a large city's affairs is more difficult in this country than in Europe, because of its heterogeneous population and rapid growth. He adds that "the struggle in city government in the United States is not so much to secure the doing of a necessary thing, as it is to procure the doing of it economically, efficiently, and honestly."

The problem is therefore one in administrative science. The first consideration is to eliminate national politics from municipal elections. In order to this, Mr. Low recommends that municipal elections be held at a time when there can arise no complication between its issues and those of national administration. Then the city charter should carefully separate executive and legislative functions. The mayor should have the power of appointment and removal of executive officers during the time for which he is responsible for the government of the city. The extent to which cities may incur debt should be absolutely fixed by constitutional limitation. All these and several other essentials are strongly urged by Mr. Low. He shows very clearly by practical illustrations just what the lack of such provisions has resulted in. The whole address is thoroughly scientific in character, and leaves the impression that the government of cities is a matter requiring far more intelligence and devotion than it usually has bestowed upon it.

THE *Sanitary news* reports that the sanitary committee of the Philadelphia board of health has decided that there is no harm in using distillery slops to feed milch-cows when supplemented by more nourishing food. If such action has been taken, it is certainly a step backward in sanitary administration. It is well settled that distillery swill in any amount is an unnatural food for milch-cows, and that the milk produced from animals so fed is unwholesome and injurious. A case is reported by the Brooklyn board of health in which it is believed to have caused the death of a child. Swill acts as a stimulant to the milk-glands, and the quantity of milk secreted is increased, while the quality is depreciated. It is to obtain a greater amount of the product that the dairymen desire to use swill; and a long experience has convinced the writer, that, if this food is permitted to be used at all, it will soon be the principal, if not the sole, food. We sincerely hope that the Philadelphia board of health will reconsider its action, and make a more extended investigation into the subject; for we feel sure that there is ample evidence on record to demonstrate to the satisfaction of any board of health that distillery swill is totally unfit food for milch-cows, even though it is given in restricted amount and in connection with other food.

GATSCHET'S ETHNOLOGICAL MAPS OF THE GULF STATES.

MR. A. S. GATSCHET'S researches on the history and ethnology of the Creek Indians have led him to a thorough examination of the available literary material referring to the Indians of the Gulf states. The results of his studies are contained in his book, 'A migration legend of the Creek Indians,' and may be seen by a single glance at the maps published in this number. The relations of the tribes are explained by the author in the notes accompanying the maps (p. 413). We wish to draw attention to the importance of ethnological researches of this kind.

Students of American ethnology feel hampered everywhere by the lack of reliable observations and the want of linguistic material. We fully agree with the author, who emphasizes, in the preface of his book, the fact that the method of furthering ethnographic study by all the means which the study of language can afford, has been too little appreciated up to the present time. The careful observer, inquiring into the psychology and ethnological character of a nation, will feel compelled to learn its language as the only means of understanding the way of thinking of the people he studies. But, besides this, the comparison of languages is one of the most powerful helps for studying the prehistoric history of mankind. The material available for a study of the Indians is in part very scanty, and much of it is irredeemably lost, the languages and tribes being extinct. Much, however, might still be saved, if public interest would encourage and support researches in this field. The philosopher cannot but regret the indifference of the public towards these studies, which are the principal foundation of a psychology of mankind. The scientific institutions which take an active interest in this matter are not many, and do not command over-large funds. The bureau of ethnology, which has done and now does most of this work in the field, is hampered by lack of means. Academies and societies are generally more interested in archeology than in ethnology. We wish it might be better understood that the only way to understand the relics of a dead culture is the study of the living one ; but we fear the interest in the Indians will not be aroused until they all are buried. Then their irrecoverably lost legends and customs, character and ideas, will seem to grow in value, and much work and money will be wasted in researches that might now be successfully done at a small expense.

It is not too late, however. Much may still be done by intelligent and careful collectors and observers, and we hope that the growing interest in science will also extend to ethnological researches. Astronomers, geologists, students of natural history, are receiving ample support from their rich fellow-citizens. Ethnology may gain friends too, which will enable students to carry on their researches and to collect material before it will be too late.

Gatschet's first map is an attempt to locate the settlements pertaining to the Indians of each of the linguistic families of the Gulf states as far as traceable in the eighteenth century. For this period of the history of the Gulf states, our remarks are particularly true, and our knowledge of many tribes is merely derived from occasional remarks of early writers. Enormous materials of this kind are embodied in the map which shows where the tribes were located. The author prefers to mark the territory inhabited by each tribe by dots, as answering better the purpose than the coloring of large areas, which conveys the impression that the population was scattered all over a certain country. He says (p. 49), "This will do very well for densely populated countries or for tracts inhabited by roving, erratic Indians, whom we meet only on the west side of the Mississippi River. The Gulf state Indians were not longer in the condition of pure hunting tribes ; they had settled in stationary villages, and derived the main part of their sustenance from agriculture and fishing." As far as the map is intended to show the exact state of our knowledge, this opinion is correct. The question, however, is not so easily settled. The migrations of tribes, the shifting of villages, hunting excursions, and many other facts and habits, tend to make the territory of a tribe indefinite ; while, on the other hand, lands, though not inhabited, are claimed by a tribe as their possession. These are some important points in favor of coloring large areas.

It will be seen on the map that the Maskóki occupied a central position. The large extent of their territory, their numbers, and their character, made them one of the most important groups in Indian history. In former times the tribes probably extended from the Atlantic to the Mississippi, and beyond that river, and from the Appalachian range to the Gulf of Mexico. They kept up a warfare with all their neighbors and among themselves ; their main branches, the Creek and the Cha'hta Indians, constantly being at war. The dialects of the linguistic stock greatly differ from each other, the Cha'hta, for instance, being unintelligible to the Creek. Gatschet divides them in four groups, — the Creek, Apalachian (Hitchiti), Alibamu, and Cha'hta. The Creek Indians occupied in historical times a central position among the other Maskóki tribes, and, by forming a strong and permanent national union, had become the most powerful of all the southern tribes.

Their traditions say that they came from the west, and immigrated into their territory in the eastern Gulf states after crossing the lower Mississippi. According to their migration legends, the Kasi'hta and Kawita tribes were the first to reach the Chatahutchi River, where they found the Kusa and the Apalatchukla settled. The situation of these places will be found on the map. All other settlements on the Chatahutchi River seem more recent than Kasi'hta and Kawita, and therefore it is probable that the Creek immigration to those parts came from the Coosa and Tallapoosa rivers.

The villages of the Creeks are built along the banks of rivers and brooks, frequently in places subject to inundations. They consisted of irregular clusters of houses. Each of these belonged to a gens, or clan, of which there were a great number, twenty of which are still in existence. Only the larger villages had a public square occupying a central position. This was reserved for the celebration of festivals, especially for that of the annual fast, which is the most prominent one among their feasts. On the square stood the council-house. The Creeks distinguished two kinds of towns, — the red or war town, and the white or peace towns. While the former were governed by warriors only, the latter had a civil government. One of the most noteworthy of the peace towns was Apalatchukla. It was considered the mother town of the Creek confederacy. No captives were put to death, no human blood was spilled there. Deputies from all Creek towns assembled there when a general peace was proposed. On the other hand, Kawita-Tallahassi, a few miles north of Apalatchukla, was an important war town. Here the chiefs and warriors assembled when a general war was proposed, and here captives and state malefactors were put to death.

Gatschet's researches on the ancient pathways are of particular interest. A detailed study of trails leading through the country forms an important part of Indian history and ethnography. But unfortunately only very few are traceable at the present time. He describes four trails leading from the eastern states to the Creek towns, crossing the Chatahutchi River by means of fords.

We cannot enter here upon the ethnographic and linguistic details contained in Gatschet's book, but confine ourselves to the foregoing remarks, which will be explanatory of part of the vast amount of information contained in the maps. It must be regretted that the publication of the second volume of Gatschet's work is delayed so long, as it will undoubtedly further our knowledge of North American ethnology as much as the first one has done.

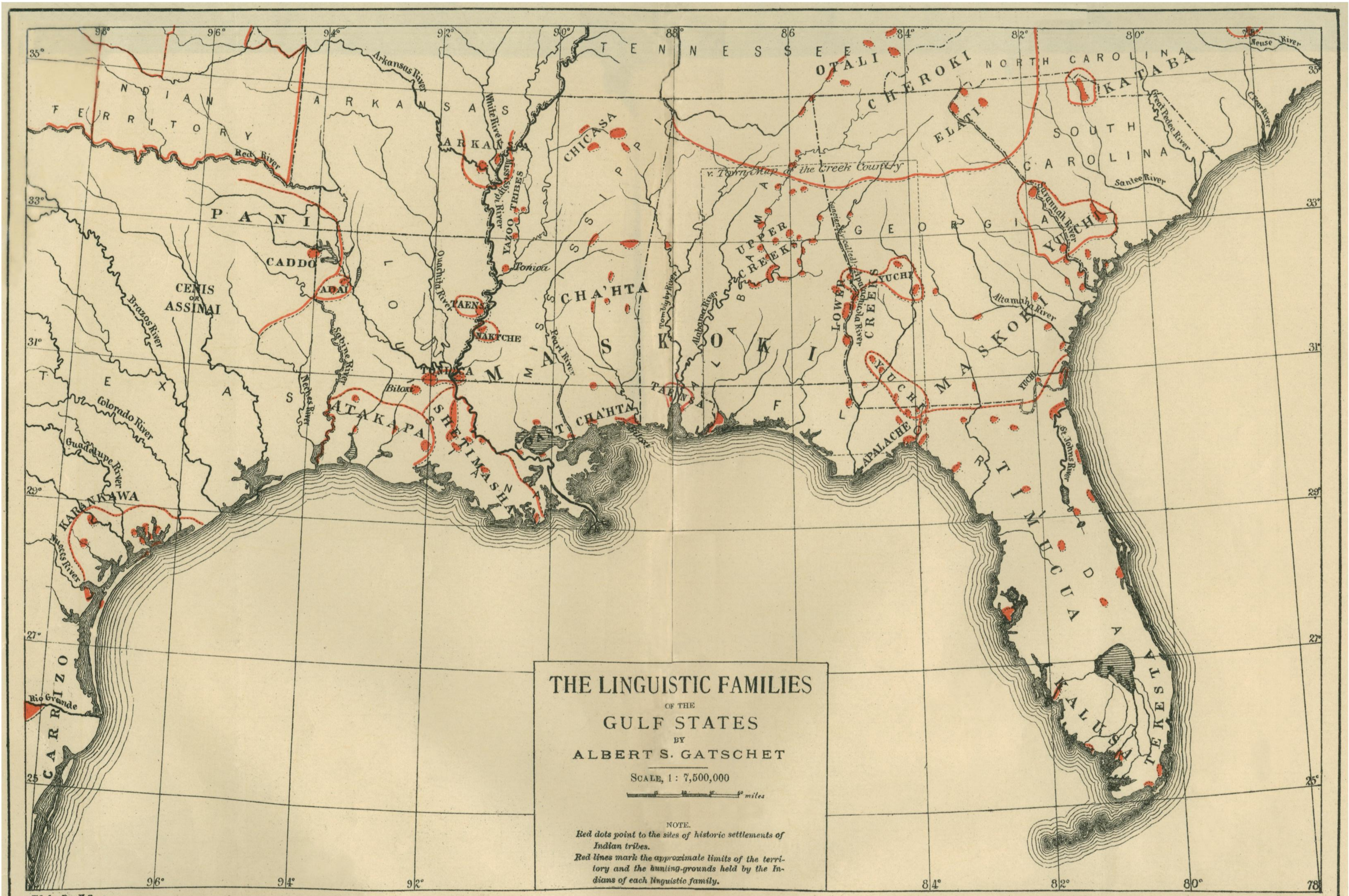
PARIS LETTER.

M. BROWN-SEQUARD has been elected president of the Société de biologie in place of the late Paul Bert.

The principal conversational topic of scientific interest at present is the particularly significant relationship existing between typhoid-fever extension and the quality of the water distributed in Paris. It is known that Paris receives its drinking-water from three principal sources: very pure and palatable water is furnished by two rivers whose waters are brought into Paris by means of aqueducts, namely, the Vanne and the Dhuys; second-rate water comes from the Ourcq River; finally, Seine and Marne water is, on account of its impurity, especially used for public purposes, — street cleaning and watering, fountains, etc. But, although the last water is generally not mixed with pure drinking-water, it often happens, especially in summer, that the Dhuys and Vanne do not furnish water enough, so that it becomes necessary to use Seine or Marne water. The consequence is, that, some time after this mingling of the pure with the impure water, typhoid-fever becomes much more prevalent. For instance: for seven weeks during which pure water is distributed in the whole of Paris (May 3–June 16), the number of typhoid-fever cases applying to the hospitals is 149. From June 9 to June 20 the Seine water is mingled with that of the Dhuys and the Vanne. During the seven weeks from June 21 to Aug. 8, the cases are 472. The number of cases begins to increase between eighteen and thirty days after the admixture of the impure water. The same relationship exists in most epidemics of typhoid-fever, between the nature of the water-supply and the frequency of the disease. Another very significant fact is, that, in barracks where the water is good (Vanne water), the death-rate from typhoid-fever is only 0.7 per cent, while in barracks (although quite new and very healthy otherwise) where Marne water is used, the death-rate rises (from typhoid-fever alone) to 17 per cent. If these facts are confirmed, — and it is unlikely that they should not be so, since a recent investigator, M. Thoinot, has found the typhoid bacillus in great numbers in Seine water taken at the very place where it is pumped for the municipal reservoirs, — the Paris board of aldermen will have to give up using Seine water, and will be compelled to secure pure drinking-water elsewhere, if it does not wish to be called, with just reason, a cold-blooded murderer, which it seems to be at present. Such a state of things is a shame to a city like Paris, and in an age of science like that in which we live.

The senate committee for the abatement of alcoholism in France has just reported, and proposes that all non-ethylic alcohols shall be excluded from wines and liquors, as they are poisonous. This is very well, but will it be very easy to devise an instrument or a chemical method for the discovery of non-ethylic alcohol in wine or spirits?

The Paris academy of medicine is going to discuss, some time hence, the question of mental overwork; and the results of these discussions,



THE LINGUISTIC FAMILIES

OF THE

GULF STATES

BY

ALBERT S. GATSCHET

SCALE, 1 : 7,500,000

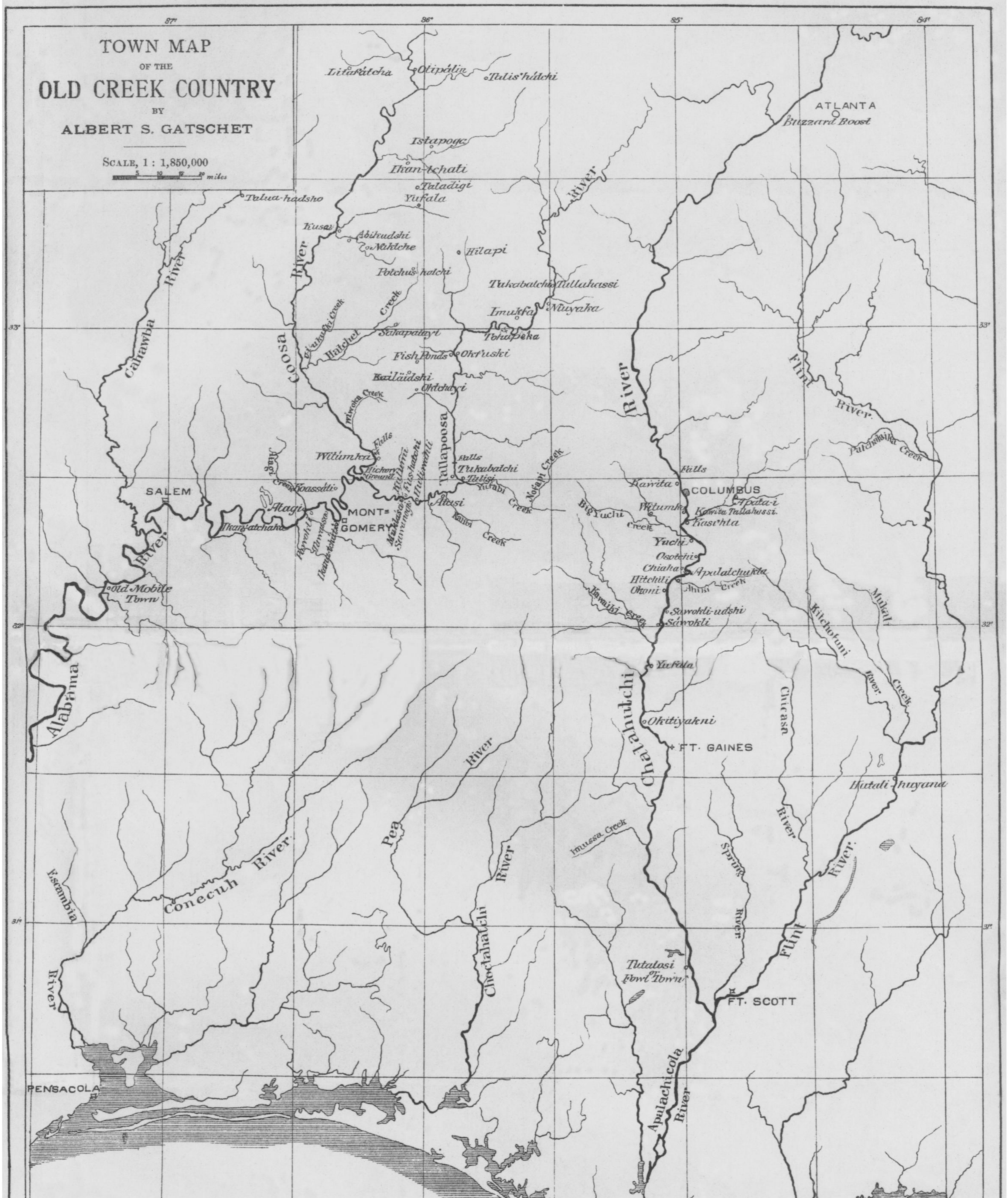
NOTE.

Red dots point to the sites of historic settlements of Indian tribes.

Red lines mark the approximate limits of the territory and the hunting-grounds held by the Indians of each linguistic family.

Ed. by Dr. F. Boas.

HART & VON ARX, 19 PARK PLACE, N.Y.



SCIENCE, *April 29, 1887.*