William Eimbeck will continue the transcontinental triangulation from Mount Nebo, near Salt Lake, and is expected to reach that station about May 20. Assistant James B. Baylor has completed his season's work of three months, having occupied twenty-three magnetic stations between Key West and Washington. For absolute measures of declination, dip. and intensity, this is considered good work for stations covering so large an area. In connection with the physical and hydrographical survey of New York bay and harbor, a much-needed work is now progressing, which consists in running a line of precise spirit-levels from the permanent tide-gauge of the coast survey, at Sandy Hook, by way of Keyport, Staten Island, Newark Bay, across New York harbor and the Narrows, up Long Island, through Brooklyn to Long Island Sound, across East River to Governor's Island, and up the Hudson River to Dobbs Ferry. A detailed topographical survey of the west half of the District of Columbia is now nearing completion, the results of which are to be published in atlas form on a scale of four hundred feet to the inch. The Patterson will leave San Francisco, about May 1, for survey-work in Alaska waters, where she will remain all summer.

— Mr. Carroll D. Wright, chief of the U. S. bureau of labor statistics, is now in Massachusetts, collecting statistics as to marriage and divorce in the United States. It will probably be a year before the data can be prepared in the form of a report. The bureau has considerable work in progress at present. The report on convict-labor will be issued in about three weeks. The report on labor-strikes will be ready this fall. Another subject of inquiry now in progress is in relation to the moral and economic condition of working women and girls in the great cities of the country. The bureau will also make inquiries into the cost of the distribution of food-staples, — how the cost of food is increased by transportation-rates, and other facts bearing on the general subject.

LETTERS TO THE EDITOR.

****The attention of scientific men is called to the advantages of the correspondence columns of* SCIENCE *for placing promptly on record brief preliminary notices of their investigations. Twenty copies of the number containing his communication will be furnished free to any correspondent on request.*

The editor will be glad to publish any queries consonant with the character of the journal.

Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

Ethnologic results obtained upon an expedition in the south-west of the United States.

IN the subsequent columns I have gathered the results which I obtained in the furtherance of ethnologic studies during a three-months' trip in Louisiana, Texas, and the parts of Mexico adjoining the Rio Grande del Norte.

I left Washington City on Oct. 5, 1886, and stopped on my way to the Mississippi only one day, to view the sites of the ancient Alibamu and Creek towns at the confluence of Coosa and Tallapoosa rivers, Alabama. The authors of the eighteenth century report three towns in the vicinity of the French fort Toulouse, — Odshi-apófa (or 'Hickory Ground'), Taskigi, and Oktchayúdshi ('Little Oktchá-yi').

Accompanied by a guide, I found the French fort, or what remains of it, at about four miles distance from Wetumpka, but several circumstances prevented me from discovering the sites of any of the settlements above named. The authors mentioned give no accurate description of their sites. The whole peninsula is sometimes flooded by high water from the Coosa River, which rises over fifty feet after long rains in the north of Alabama state, and necessarily destroys the vestiges of old habitations; and the country has become overgrown with pine-woods and shrubbery.

At the confluence of Tensaw and Little rivers with Black or Washita River there are four curious mounds in an advanced state of disintegration. One of them is of enormous height, and, as the tradition goes, had once a little pond on its top. According to another tradition, this was the spot where the retreating Natchez Indians defended themselves against the pursuing French troops in 1731. This looks more like the theory of some ambitious archeologist.

Three miles east of Pineville, Rapides parish, La., I then visited the site of a Cha'hta village and cemetery. It lay on the ground which formerly made up Solabella's plantation, and, although the village was abandoned but ten or fifteen years ago, nobody could tell me the Indian name of it. Wherever the chimneys of the cabins stood, there was a little mound or eminence; and upon every grave in the burial-ground stood a plum-tree, which the mourners used to plant to mark the head of the deceased. The main camping-place is now overgrown with horse-mint. The majority of these Indians had gone to a mission in the Cha'hta Nation some time before the secession war, a half-blood Cha'hta chief, Jim Fletcher, having prompted them to go there. Formerly these Cha'htas had annual ball-games with the Biloxis, two hundred of whom inhabited a village on the north-east bank of Red River, thirty miles above Alexandria. The ground is now owned or held by a Mr. Smith, and these Biloxis all went either to the Cha'hta Nation or among the Caddos, Indian Territory.

The Biloxi Indians, whom I saw and studied, live on Indian Creek, five or six miles west of Lecompte, Rapides parish. The unhealthy location of their present abode in the pine-woods, flooded in the rainy season, has of late subjected them to the ravages of fever. There they stay, on the property of Mrs. Martin, and make a living by working for wages. Most of them are small, sturdy people, show no trace of tattooing, and generally speak English more than their native tongue. I studied their language at Lecompte, and found at once that it belonged to the Dakotan or Siouan family. About twelve Biloxis speak or understand it: all the others — fifteen or twenty — know English only. They know nothing about earlier migrations of their tribe,

except that they came from Avoyelles parish, perhaps thirty years ago. They call their own tribe 'Táneks,' 'Tánuks,' or 'Tánks,' but cannot interpret this name. The Tunicas call them 'Yóroni.' The presumption is that the other tribes living in their neighborhood when they were still upon the Gulf coast (Pascagoulas, Chozettas, Moctoby) spoke Dakotan dialects also; and the discovery of the Biloxi language is of great importance, because it upsets the old theory that the so-called Cha'hta tribes of the Gulf coast, or southern Cha'hta tribes, spoke Cha'hta dialects throughout. The Bayagoulas and Mugulashas probably did so; but of the Húmas, Tchaouachas, Tohomes, Tangipahoa, and Opelousas, this cannot be said with certainty. They all used, however, the Cha'hta or Mobilian trade language as a means of intercommunication.

Before the Biloxis on Indian Creek left Avoyelles parish, they lived there peaceably with another tribe, the Tunica. Some twenty-five of these still remain in their old homes on the Marksville prairie, a little to the south-east of Marksville, the parish seat. They are the Tassenocogoulas and Avoyelles of the old documents. In the eighteenth century other Tunica villages existed besides these, — the Tunicas on lower Yazoo River, and those on Mississippi River a few miles below the Red River junction.[1] Those in Avoyelles parish called themselves Shixkaltini, or 'flint people,' after a former chief, as alleged. Of these, I found a young man at Lecompte, from whom I obtained thorough information on his language. The only mode of disposing of the dead among the southern Indians seems to have been that of inhumation.

Comparisons made with the vocabularies of all the languages formerly spoken in the countries on both sides of the lower Mississippi River and its affluents, even with the Páni dialects, as Caddo, Yátassi, Nadaco, Wichita, have shown that affinity existed with none of them, and that therefore Tonica represents a linguistic family for itself. It has many phonetic peculiarities. The sound *f*, which is so frequent in the Maskóki dialects, is wanting here, as well as *v*. Instead of *ts*, *ds*, the language has *tch*, *dsh*. Of trills, we find *l* beside *r* and the uvular *r*, the *r* being not our rolling *r*, but the sound heard in 'mar,' 'bar.' *D* and *b* occur very seldom, and interchange with *t* and *p*, as *g* does with *k*. The surd guttural *k* almost in every instance interchanges with *xk*. This is done, for instance, in the numeral series, which is decimal, and in the name of the people itself, which may be pronounced 'Túnika' or 'Túnixka,' — a compound of *ta-* (a sort of an article, 'the'), *úni*, or *óni* ('man,' 'people'), and a suffix, *-ka*, *-xka*. The language is nasalizing, though not so strongly as Cha'hta, and is more vocalic than the latter.

In morphology the language is distinct from other southern tongues, 1°, by having a feminine besides the masculine form in the noun, pronoun, and verb; 2°, by having a dual of three persons in the pronoun and the verb; 3°, by the above article, *ta-*, *tĕ-*, *t-*; and, 4°, by a sort of reduplication of the radix in some of the shorter adjectives and verbs, which differs entirely from the reduplication found in the Maskóki dialects. The existence of a masculine and a feminine gender, shown by the appending of *-ku* for the masculine, and *-tchi*, *-'htchi*, *-xtchi*, for the feminine, is extremely curious, and, since it extends to the substantive noun also, finds very few analogies in American languages (northern Tinné dialects, Maya, Carib, and the disputed Taensa). The words for 'woman' (*núxtchi*) and for 'female' (*tí'htchi*) contain this suffix also, and, from what I have observed, the term 'feminine' seems better applied here than 'metarrhenic,' which was proposed for similar distinctions by French linguists. I have obtained several highly interesting tales, evidently very ancient, in the Tonica language, with interlinear translation in Creole French.

Being unable to find any person who could reliably inform me of the present whereabouts of the Karánkawa tribe, once upon the Texan coast near Lavaca Bay, I repaired to San Antonio, in Bejar county, Tex. The so-called Mexicans living in and around that rising city, and selling their produce upon the large market-square, have an Indian countenance and expression, with the same ashy complexion which I had previously observed among the Káyowē Indians. They all speak Spanish, but nevertheless I was forcibly struck with the idea that these must be the descendants of the Indians once gathered into the Alamo and the four missions, now in ruins along the San Antonio River, south-west of the city. Our information upon these tribes is so defective that we scarcely know their names. It is surmised, however, that all or some of them spoke dialects of one family, which has been called 'Coahuilteco' or 'Tejano' by Orozco y Berra (1864).

From Laredo, Webb county, Tex., I went south to Camargo, and found, in the vicinity of San Miguel, the terminus of the railroad to Matamoros, the remnants of the Comecrudo ('raw-eating') tribe, who have established their cane-lodges on both sides of the track near Las Prietas. They are commonly called 'Carrizos' by the whites, but insist on being called 'Comecrudos,' the extinct Carrizos having lived at Camargo and north-west of that town. Only the oldest men and women of the Comecrudos remember the language or converse in it among themselves. A part of these Indians formerly lived in the woods to the south, at Charco Escondido. The full-blood Comecrudos seen by me were slim and tall, some of them of a whiter complexion than the Mexicans around them. The pronunciation of these Indians is remarkably clear, and only a few words contain nasal sounds. The language is lacking the sounds *f*, *r*, *tch*, *dsh*, *ts*, *ds*, *b*, and *d*, but diphthongs are frequent. Only two tenses are extant, but the noun is inflected by some cases of a locative character. A demonstrative particle, *pa-* or *pe-*, is found before almost every noun, and in some verbs also. There is also a tendency to oxytonize many words, especially substantives, although the accent shifts, as in other Indian languages.

The same simplicity and paucity of sounds is found in the Cotoname language, formerly spoken in the same district. I could find only one man living who remembered words of it, and I had to visit him several times before he could gather up his recollections so as to rely on them as truthful. As late as 1850 the naturalist Berlandier, who lived in Matamoros, had no difficulty in obtaining a full vocabulary of that language, but I obtained only about one hundred terms. It differs so considerably from Comecrudo, that I thought at first I had secured a representative of a new family, but subsequently discovered it to be a distant dialectic form of the

[1] These Tonicas were the stanchest Indian friends and allies of the French colonists on the lower Mississippi.

same stock. I could not obtain the numerals in Cotoname, but in Comecrudo the majority of them are borrowed from Nahuatl.

The Comecrudo Indians mentioned to me a number of extinct tribes, who lived in their vicinity, and spoke their language, or dialects closely related to it, but left no representatives at the time of my visit. These were the Casas Chiquitas, Tejones (or 'raccoons'), Pintos or Pakawás, Miákkan, Catujanos, and the Carrizos above mentioned. The Pintos and the Cotonames originally belonged to the northern or Texan side of the Rio Grande. The Miákkan belonged to the Mission de los Borregos, at the town of Mier, and spoke a language that was neither Cotoname nor Comecrudo.

Upon being informed by a French priest at Rio Grande City that a colony of Indians existed at Saltillo, the capital of Coahuila state, I resolved to visit that place. One day's ride upon the railroad brought me there from Laredo. The country between the Rio Grande and Saltillo can be irrigated only in a few places, for want of running water; but if that commodity was procured through artesian wells, or pumped by windmills to the surface, there would be no land more fertile on earth. The ground luxuriantly produces the nopal, guisache, mescal, palm-tree, and *uña de gato* (or 'cat's-claw') tree. The scenery, as soon as the mountain-ridges are reached, at Lampazas, is of extraordinary grandeur, the effect being heightened by the transparency of the southern atmosphere. Beyond the city of Monterey the railroad-track begins to wind up along the tortuous passes of the Rinconada, once held and strongly defended by the wild tribes of the Guachichile Indians; then it emerges into a wide, dry plain, in the midst of which Saltillo (literally, 'the small water-spring') is situated, surrounded upon all sides by the high mountains of the Sierra Madre. In this city of about 42,000 inhabitants, the Tlaskaltec Indians, said to count about a thousand souls, live in some of the eastern thoroughfares, and in early colonial times were allotted the whole eastern quarter of Saltillo, which was founded about A.D. 1575. Over a hundred and fifty families of these Indians were then brought to this distant place from Anahuac to defend the new colony against hostile tribes, such as the Guachichiles and Borrados, who seem to have disappeared entirely since the eighteenth century. The Indians, who now speak the Tlaskaltec language, which is almost identical with Aztec, do not number over two hundred. The language has adopted as many Mexican-Spanish terms as English has adopted words from Norman-French, or perhaps more. *La planta de mókshi* is 'sole of the foot;' *huesito de nókshi*, 'ankle-bone;' *se chorrıto de atl*, 'a cascade;' *cerca de naxkoyóme*, 'around the city.' Tlaskaltec has also lost many derivational endings from the old Nahuatl, as in *nenépil*, for *nenépilli* ('tongue').

It is quite probable that the linguistic family to which the tribes on the lower Rio Grande belong extended once to Saltillo and the rest of Coahuila, or at least to the western slope of the mountain-chain forming the Rinconada passes. But no vocabularies of these tribes are now extant, and we have to expect the concluding numbers of a publication now issued at Saltillo by Mr. Esteban Portillo, which will perhaps shed more light on this subject. The title of this book is 'Apuntes para la historia antigua de Coahuila y Texas' (Saltillo, 1886, 8°). This title is explained by the circumstance that Texas once formed a part of the local government of Coahuila, which, from the sixteenth to the eighteenth centuries, comprised a much larger extent of territory than it does now. ALBERT S. GATSCHET.

Two ethnographic maps.

LINGUISTIC FAMILIES OF THE GULF STATES.

THE annexed map represents the linguistic families of Indian dialects within the south-eastern parts of the United States of America, as far as they could be traced through actual remnants of tribes still lingering in their old haunts, or in the vicinity of these, and by historic research. As far as the smaller stocks are concerned, their areas, or the probable limits of the territories claimed by them, are shown by lines, mostly of a rounded shape, enclosing their principal settlements, which are marked by colored dots. Full ethnographic and historic particulars of these linguistic families will be found in my publication, 'A migration legend of the Creek Indians' (1884, vol. i. pp. 11–118). In the present article I restrict myself to a few remarks necessary for the understanding of the map, and begin with the family of the

Timucua. — This Floridian stock, properly called Atimuca, extended north to a line which can be indicated only approximately, and seems to have extended farther north on the Atlantic side than on the western side towards the Chatahutchi River. It is very probable that the Kalúsa and Tekesta villages at the southern cape of Florida spoke dialects of Timucua. Tribes speaking Creek and Hitchiti dialects had intruded upon the Timucua domain since 1550 (perhaps before); and from 1706 to the present time they have inhabited its whole area, under the name of Seminoles.

Kataba. — The dialects of this family, which does not properly belong to the Gulf states, must have occupied a much larger area than is indicated by the two rings on the map. But since we possess but two vocabularies, Katába proper and Woccon, these alone could be indicated in the map, for fear of infringing against historic truth.

Yuchi. — From historic documents, three areas could be made out for this people, which never appears prominently in history. Of these, the settlements on Chatahutchi and upper Flint rivers were the most recent. Other Yuchis existed between the Altamaha River and the northern border of Florida. In the Creek Nation, Indian Territory, they occupy a tract near Wialáka and Deep Creek, on the south shore of the Arkansas River.

Cheroki. — The settlements of this people were divided into Otali or Otari ('upland' or 'overhill') towns, and Elati or Erati (or 'lowland') villages, the latter in upper Georgia and Alabama. The limit between the Cheroki and the Maskóki family is marked approximatively. The land cessions made by Cheroki Indians to the United States government are given in detail in C. C. Royce's 'Map of the former territorial limits of the Cherokee Indians,' etc., issued in the 'Fifth report of the bureau of ethnology,' with his article on the same subject (pp. 123–378), now in press.

Arkansas, properly called *Ugáxpa* (or 'downstream') tribe, speaks a dialect of the great Dakotan or Sioux family. The subdivisions of this tribe now live in the north-eastern angle of the Indian Territory. The Biloxi, formerly on the Gulf coast, state