That the newly discovered Marksville culture may belong to the oldest of all the mound building cultures in the Mississippi Valley is the conjecture of Mr. Setzler. The objects seem older in type than those in the northern part of the valley. How old they may be he prefers not even to guess. Perhaps fifteen centuries old, he hesitatingly says, just to give a vague idea. From this southern center the Mound Builder culture may have spread.

Hope of setting in order the cultural events in the Mississippi Valley looks promising, Mr. Setzler believes, with Marksville yielding a very old Mound Builder culture that seems to merge into the famous Hopewell culture that moved north. And to carry the story on toward modern times, at another Louisiana site, James Ford, Mississippi archaeologist, has found the sequence of Hopewell culture, followed by what is known as Coles Creek type of culture, and in Mississippi by prehistoric Tunica Indian culture and then finally by Tunica Indians of historic times.

Efforts to link the Mound Building tribes definitely with known historic Indian tribes have heretofore yielded little satisfactory information. But now the line of heredity seems to be traceable, and by more scientific excavations in the southeast the tribes that evolved from these ancient Mound Builders will be known.

Science News Letter, November 11, 1933

METEOROLOGY

Chilly, Droughty Winter Indicated for California

CALIFORNIA is in for another winter with temperatures below normal and little rain. Thus Dr. George F. McEwen, Scripps Institution oceanographer, has interpreted the trend of weather-making factors off the West Coast, following his custom of the past several years, in which he has scored a high percentage of hits. He was right regarding both low temperature and scanty rainfall for the winter of 1932-33.

The coming winter is not expected to be as chilly as last year's, he says, though it will still be below normal in temperature averages. On the other hand, the precipitation trend indicates a drought even more severe than last season's. Values of seasonal precipitation, as he has calculated them, range from 60 to 85 per cent. of the average.

Science News Letter, November 11, 1933

ENGINEERING

Streamlining Saves Power Of 1933 Automobiles

But Most Rakish Current Model Still Has Twice as Much Air Resistance as Completely Streamlined Motor Car

THE AUTOMOBILE of 1933 consumes 30 per cent. less power in overcoming air resistance than its predecessor of 1928, wind tunnel measurements on models by R. H. Heald of the U. S. Bureau of Standards show. This improved performance comes as a result of the modern trend toward streamline form. The tests showed, however, that the air resistance of the 1933 car is still more than twice that of a completely streamlined car of the same frontal area.

The aerodynamic characteristics of six small scale replicas, ranging from one-quarter to one-fifteenth natural size, were studied in the wind tunnel at air speeds from thirteen to seventy miles per hour. These six models were a 1922 sedan, a 1922 touring car, a light sedan of 1928, and of 1933, and two models of the autos of tomorrow. The 1933 model was a composite model and not an exact duplicate of any actual make. It was equipped with disk wheels, exposed bumpers, fenders, headlights and spare tire. One model of the auto of the future differed from it in having the windshield inclined at a 45 degree angle, the top rounded front and rear, and a general smoothing of lines. The other model of the future presents a radical departure in design; the whole upper structure is rounded, blunt in front and tapered to the rear so that it resembles a section from a thick airplane wing. The wheels of this car are enclosed in the body.

Air Drag Devours Power

Mr. Heald measured the resistance offered by these models to air currents of known velocity and from this data he obtains the so-called drag coefficients which express the aerodynamic efficiency of the model. These coefficients ranged from 0.0017 for the 1922 sedan, 0.0018 for the 1928 sedan, 0.0014 for the 1933 sedan to 0.0005 for the ultramodern car of the future.

The significance of these figures can be more readily appreciated when these drag coefficients are converted into horse-power consumption for an actual automobile. At a speed of 60 miles per hour air resistance devours 27 horse-power for the 1922 sedan, 33 horse-power for the touring car of the same period, 26 horse-power for the 1928 sedan, 18 horse-power for the 1933 sedan, and 8 and 6 horse-power for the two streamlined models. The slight improvement of the 1928 model over those for 1922 is due, not to any improvement in aerodynamic design, but to a reduction in frontal area, and to a lesser extent this is true also of the 1933 car as compared to the 1928 model.

At 48 miles per hour the power consumption due to air resistance is only half of that at 60 miles per hour while at 76 miles per hour it is doubled.

Great Saving at High Speeds

A very striking feature of Mr. Heald's results is the prediction that the 1933 automobile, shorn of its projecting bumpers, headlights, and spare tire, fitted with a sloping windshield and a rounded top, would consume 10 horse-power less at 60 miles per hour, and about 20 horse-power less at 70 miles per hour. The saving in gasoline would be of considerable importance for those who cruise at these speeds.

The completely streamlined, aerofoil type as represented in the most advanced of Mr. Heald's models, offers a further slight improvement in performance but this would only be of practical significance at considerably higher speeds. However, Mr. Heald points out that an automobile body of this shape would act like an airplane wing and at high speeds would produce a lifting force. The effect of this lifting force on performance has not yet been investigated.

Science News Letter, November 11, 1933

Carrying a refrigerator out into the field to the corn was the means adopted by scientists who wanted to study resistance of corn to cold in the field.