

natives of that island "barbarous people" in the same sentence in which he tells us of their kindness and hospitality. This simple and purely negative meaning of the word barbarian has been lost to us, and it has become inseparably associated with characteristics which are indeed common among uncivilized nations, but are by no means confined to them. The epithet "savage," of course, still more distinctly means something quite different from rude, or primitive or uncultivated. The element of cruelty or of ferocity is invariably present to the mind where we speak of savagery, although there are some races—as for example, the Eskimo—who are totally uncivilized, but who, in this sense, are by no means savage.

And this may well remind us that, as we have found it necessary to define to ourselves the condition which we are to understand by the word civilization, so it is not less essential to define and limit the times to which we are to apply the word primeval. For this word also is habitually used with even greater laxity of meaning. It is often employed as synonymous with primitive, and this again is applied not only to all times which are prehistoric, but all conditions even in our own age which are rude or savage. There is an assumption that, the farther we go back in time, there was not only less and less extensive knowledge of the useful arts,—not only simpler and simpler systems of life and polity,—but also that there were deeper and deeper depths of the special characteristics of the modern savage. We have, however, only to consider what some of these characteristics are, to be convinced that although they may have arisen in early times, they cannot possibly have existed in the times which were the earliest of all. Things may have been done, and habits may have prevailed, when the multiplication and dispersion of Mankind had proceeded to a considerable extent, which cannot possibly have been done, and which cannot possibly have prevailed when as yet there was only a single pair of beings "worthy to be called" man and woman, nor even when as yet all the children of that pair knew themselves to be of one family and blood. The word primeval ought, if it is to have any definite meaning at all, to be confined to this earliest time alone. It has already been pointed out, that on the supposition that the condition of primeval man approximated to the condition of the lower animals, that condition could not have been nearer to, but must, on the contrary, have been very much farther removed from the condition of the modern savage. If, for example, there ever was a time when there existed on one spot of earth, or even on more spots than one, a single pair of human beings, it is impossible that they should have murdered their offspring, or that they should have killed and eaten each other. Accordingly it is admitted that cannibalism and infanticide, two of the commonest practices of savage and of barbarous life, cannot have been primeval. But this is a conclusion of immense significance. It hints to us, if it does no more, that what is true of one savage practice may possibly be true of others.

(To be Continued.)

ASTRONOMY.

COMPARISON STARS:—Under this heading Mr. Dreyer, in the last number of *Urania*, makes a most excellent "Suggestion to Astronomers" upon a matter which, of late, attracted some little attention. It is to be hoped that other observers will follow the example set at the Dunsink Observatory. Mr. Dreyer's "suggestion" is as follows:

"In spite of the numerous star-catalogues in the hands of observers of minor planets and comets, it frequently happens that a well-determined place for a comparison star cannot be found in any catalogue. Many stars have therefore to be re-observed, and much time is no doubt lost by a number of observers, each having to determine

the places of a few stars, which, if put together in one working list could be observed by one person with but little trouble.

It would evidently be an advantage if an astronomer, having at his disposal a good transit circle, would, for a time, endeavor to determine the places of all the comparison stars recently used and requiring re-observation.

In accordance with this scheme, I shall, until further notice (with the concurrence of Dr. Ball) be glad to determine with the Dunsink Transit Circle the places of any comparison stars north of -20° Declination not found in modern catalogues, and recently used in observations of minor planets or comets. The mean places, based on the Fundamental Catalogue of the 'Astronomische Gesellschaft,' will be worked out and published as soon as practicable."

THE SOLAR PARALLAX.

M. Faye has recently communicated to the Paris Academy of Sciences (*Comptes Rendus Tome XCII., No. 8*), an interesting paper upon the actual state of our knowledge of the sun's parallax. Remarking that there is no other constant in science whose determination depends upon such a large number of entirely independent results, he subdivides the various values assigned for the sun's mean parallax, as follows:

Geometrical Methods	{	8.85"	by Mars (Cassini's method).....	Newcomb
		8.78"	by Venus, 1769 (Halley's method).....	Powalky
		8.81"	by Venus, 1874.....	Tupman
		8.87"	by Flora, (Galle's method).....	Galle
		8.79"	by Juno.....	Lindsay
Mechanical Methods	{	8.81"	by the lunar inequality (Laplace's method).....	—
		8.85"	by the monthly equation of the earth.....	Leverrier
		8.83"	by the perturbations of Mars and Venus.....	Leverrier
Physical Methods	{	8.799"	velocity of light (Fizeau's method).....	Cornu
		8.81"	" " " (Foucault's method).....	Michelson
		8.813"	" " " (Foucault's method).....	Michelson

In regard to the value 8.85" obtained by Cassini's method, M. Faye says that Mars has always given values for the solar parallax somewhat too large. The first value 8.81" obtained by mechanical methods was calculated by adopting for the coefficient of the inequality $125.2''$, the mean between the result of Airy from the Greenwich observations, and that of Newcomb from the Washington observations, taking for the moon's parallax $57' 2.7''$, and for her mass $\frac{1}{80} \times$. By the second of the "mechanical methods" Leverrier found 8.795, which was afterwards reduced to 8.85" by Stone upon correcting two slight errors in the computation. The value from the perturbations of Venus and Mars, assigned by Leverrier was 8.86", but one of the numbers requiring a small correction, it is reduced to 8.83". Michelson having overcome all the difficulties in Foucault's method, found for the velocity of light 2,999.40 kilom. $\pm$ 100 kilom. Using Struve's constant of aberration the corresponding values of the parallax are 8.799" and 8.813", as above. The general mean is 8.82", to which M. Faye attributes a probable error of $\pm 0.016''$. Although each of the values may be effected by systematic error, nevertheless, since the causes of error are varied, and without the least possible connection, these errors must be to a great degree eliminated, as well as the accidental errors.

The following conclusions are reached:

1. That the physical methods are superior to all others, and should be adopted.
2. That the value of the solar parallax, 8.813" (by physical methods), is now determined to about $\frac{1}{100}$ of a second.
3. That the seven astronomical methods converge more and more towards that value, and tend to confirm it, without equalling it in precision.

This fact does not diminish, however, the great importance of observations upon the coming transit of Venus, to which we can now bring to our aid the most effective of photographic apparatus.

W. C. W.

WASHINGTON, D. C., April 14, 1881.