

ought to experience the least difficulty in using the simple adjectives "higher" or "upper" and "lower" for the parts of the spectrum, and the simple prepositions "above" and "below," where required. There is no possibility of misconception, and no explanation is needed.

Probably we have got beyond the stage in which misconception is likely to arise from the careless use of words expressing continuity or otherwise in a spectrum; but I would suggest the word "diffuse" where it is not intended to express anything precise. Thus the coronal spectrum is diffuse until we know it to be solar. M. Janssen testifies to dark lines seen in the (diffuse) spectrum.

J. HERSCHEL.

Camp Nandair, Hyderabad, March 19

Turner's Vision

I HAVE been waiting since the appearance of a report of Dr. Liebreich's lecture in NATURE of March 21 expecting that an animated discussion would be provoked, affording me an opportunity of slipping in obscurely as a minor combatant, the subject being one on which I am but very indifferently qualified to speak, although thirteen years ago I did incidentally suggest an explanation of the peculiarities of Turner's later pictures which, simple as it is, still appears to me sufficient. On page 67 of "Through Norway with a Knapsack," published in 1859, speaking of some of the peculiar midnight sunset effects of the North, I said that "Turner, like an eagle, has dared to face the sun in his full glare, and to place him in the middle of his pictures, showing us how we see a landscape with sun-dazzled eyes, when everything is melted into a luminous chaos, and all the details blotted out with misty brightness."

In all these peculiar pictures that I have seen the sun is thus placed in the middle of the picture, and just sufficiently above the horizon (from about 10° to 20°, or at most 25°) to pour his rays about perpendicularly to the curvature of the eye-ball, when the face is in position to contemplate a landscape. I have frequently repeated the experiment of contemplating a landscape under such circumstances, and on every occasion of submitting to such torture have seen all the effects of even the most extravagant of Turner's later pictures, which are so well described by Dr. Liebreich. I have seen the "vertical streakiness, which is caused by every illuminated point having been changed into a vertical line," with an "elongation, generally speaking, in exact proportion to the brightness of the light," and that "there proceeds from the sun, in the centre of the picture, a vertical yellow streak." These appearances may arise from an affection of the crystalline lens of my eye similar to that attributed by Dr. Liebreich to Turner, or it may be due to something else much simpler, and which is more or less common to all human eyes. If the simpler explanation based upon normal conditions covers the facts, it certainly must be the more acceptable.

My explanation of the vertical streaks is this. When we thus look full faced at the sun, the dazzle produces slight inflammation or irritation, and a flow of tears. The liquid accumulates, and rests upon the lower eyelid, forming a little pool, the surface of which has a considerable vertical curvature, *i.e.* the lower part of the retained tear curves upwards from the surface of its base at the root of the lower eyelashes to its summit contact with the conjunctiva. Thus in a vertical direction it must act as a lens of very short focus, it must refract and converge the rays of light in a vertical plane, and thus produce a vertical magnifying effect, the definition of which will of course be very confused and obscure, on account of the irregular curvature, and the fact that the eye is focused to the distant objects. This want of directive focusing will limit the distortion to the bright objects whose vertically magnified images will be forced upon the attention.

To test this explanation let any one select a bright afternoon, and at about 6 P.M. or a little later, at this season, gaze sunward upon any landscape free from London smoke or other medium of solar obscuration. At first, if his eyes are not very sensitive, he will see a circular sun, but presently, as the tears accumulate, the vertical elongation of the sun and general "vertical streakiness" will appear. When I tried the experiment last week the sun appeared like a comet with a brilliant vertical conical tail, the point of which rested on the horizon. But I was then slightly troubled with what is called "a cold in the head," and my eyes watered very vigorously, and thus the conditions for producing fine Turner-esque effects were highly favourable. On carefully drying my eyes these effects were, for a moment, considerably diminished.

I have adopted another method of testing this explanation. Having caused the eyes to become somewhat suffused, I bring the upper and lower eyelids so near together that the liquid shall occupy a sensible depth, *i.e.*, from the conjunctiva to the base of both upper and lower eyelashes, and by compression be bulged or curved outwards in the vertical direction. On looking through this tear-filled chink at a gaslight, the vertical elongation is remarkably displayed, and it extends upwards or downwards or both according to the position of the liquid. When looking at the sun and landscape with the eyes fully opened (which is very painful), the elongation is chiefly downwards, and obviously connected with the tear on the lower eyelid; but if the eyelids be nearly closed to diminish the intensity of the light, an upward elongation is also commonly visible.

The other phenomena represented by Turner are, I think, simply a faithful copying of the effects of glare and suffusion produced by painful sun-gazing and the looking at a landscape where the shadows are, so to speak, nowhere, or all behind one's back.

W. MATTIEU WILLIAMS

The Adamites

As "M. A. I." prefers to keep his incognito, I shall not seek further to induce him to reveal himself. He has now, however, pointed out what he conceives to be errors in my paper, and I will reply to his criticism.

In the first place, as to the word *pi-ta*, I neither said nor inferred that the final syllable is not a suffix. My remark was that it retained a primitive root, *ta*, which is found also in the Semitic *'ata*, and I submit still that I am perfectly correct. The suffix *ūr* in Sanskrit denotes nouns of agency, as Bopp shows in his "Comparative Grammar," and I am quite justified, when I find in various other languages a root word similar both in sound and sense, in inferring that the Sanskrit suffix was originally of the same character. I have hitherto been under the impression that comparative philology had established that suffixes were at one time independent words, but it appears that I am wrong. To show, however, that I have erred in good company, I would refer to Prof. Max Müller's "Stratification of Language" (p. 32), where it is said, "suffixes and affixes were all independent words, nominal, verbal, or pronominal; there is, in fact, nothing in language that is now empty, or dead, or formal, that was not originally full, and alive, and material." I must plead guilty of ignorance of "M. A. I.'s" scientific method.

As to *Taata*, when it is shown that *Tamata* or *Tangata* was the original form of the Polynesian deity's name, I shall be better able to reply to your correspondent's criticism. In any case, the final syllable is evidently the word denoting "spirit," and I see no difficulty in *Ta* becoming either *Tam* or *Tang* as the result of phonetic change. The mere fact that *Taata* and *Tibi* are different gods with different attributes really amounts to nothing, since such a division of personality and characteristics is a common fate of the divinities of heathen mythologies. I see no reason to change my opinion that the name of the Polynesian great ancestor has preserved the same primitive root as that which is to be found in the name of the first man, Adam, of the Semites, or rather of the *Akkad* forerunners.

While replying to "M. A. I.," it may be well to notice the criticism of his advocate, Mr. Jenkins, for whose explanation of the meaning of the word *Adam* I am much obliged, although, if he will take the trouble to read my paper, he will see that I was not ignorant of what he states. But the acceptance of the Hebrew meaning of the word as the original one does not lead me to place much reliance on Mr. Jenkins's judgment. If the Old Testament narrative proves anything beyond a knowledge of the tradition as to Adam, it is that the narrator was a bad philologist, and that finding the Hebrew word *adamah*, he forthwith inferred that the first man was made of ground-dust, which gave to him its red colour. For my part, I entirely ignore the authority on such a point of the Hebrew writer, and in justification I beg to refer to the statement made by the Rev. A. H. Sayce before the Society of Biblical Archeology, as reported in the last number of NATURE (p. 495), that the early Semitic traditions are derived from an Akkadian source, as are also most of the biliteral roots of the Semitic language. If the traditions are taken from that source, the probability is that the proper names they enshrine have had the same origin; and I submit, therefore, that I am quite justified in tracing the meaning of the word Adam to the old Chaldean tongue, in which, as Mr. Norris's Assyrian dictionary shows, and as my paper asserts, *Ad* signifies "a father."