some distance beyond his abiding-place by reason of mental pre-occupation. There are two lines of cerebral action going on at once, — one, the active mental study which engrosses him; the other, the unconscious action that keeps him out of danger from passing vehicles, or from other causes incident to city life. The limitation of direction which Professor Newcomb regards as exceptional, I consider as general: i.e., I believe that there are vastly more men who have no definite idea of lines as a standard of reference, than there are those who refer every thing in direction to such co-ordinates; just as there are many who never have any definite idea of the cardinal points of the compass, either as real or ideal points, and who never arrive at any clear conception of the bearings of familiar buildings, or the direction of streets, though they may live in the same city for years. The domination or tyranny of a fixed idea is explanatory of the difficulty which Professor Newcomb experiences. His ideal or subjective west was the domination of a fixed idea indelibly imprinted upon the super-sensitive cerebral cortex of youth, not necessarily associated with ideal or absolute direction, or with any system of horizontal lines, but an isolated conception, formed out of the perception of different positions, which in early youth could hardly be correlated with any abstruse reasoning. This idea of west, once ingrafted upon a developing brain, became a fixed factor, so dominant as to tyrannize over the understanding, and so persistent as to require some moments of study to dispel the illusion. This becomes evident from an analysis of his third division. The tyranny of the early idea has usurped control over the will, and, indeed, over the whole cerebral outcome. Even though the internal evidence corresponds with the external bearings to show that his preconceived west is really *not* west, but some other point, yet so strong is the power of this subjective idea, that by no process of argument can he rid himself of it. This is not uncommon, but by no means of frequent occurrence. But it is not a normal harmony of relation between the various reciprocal functions of the brain. It is likened to a habit formed in youth, so strong as to be ineradicable in manhood, and has been studied with much care by psychologists. Again: one may be mistaken as to direction, or become confused in tracing his route through the intricacies of his hotel, without associating such perversions with any states of subjective consciousness, so far as these states may involve the consideration or differentiation of the 'co-ordinates.' A man who is ignorant of the cardinal points of the compass, and who never can tell in which direction he is facing, loses his way because he has lost his bearings: the road was known by reason of the association of other facts, — a certain house just here, or a lamp just there, — and not because his horizontal lines have led him astray. In view of what we have learned of unconscious cerebral action, of habit, of the association of ideas, of the tyranny of a fixed idea, and of subjective states of consciousness leading on to abnormal objective conditions, it seems to me that Professor Newcomb's case is not an isolated one, and that what he has written of himself has already been written of and discussed.

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Colorado climate.

For the benefit of other sufferers, please allow me to correct what is likely to lead to an erroneous impression, on reading Dr. Fisk's article on 'Climate in the cure of consumption,' as published in SCIENCE of Oct. 5. Dr. Fisk, in his very able article, like most of those who have written of the fitness of the climate of Colorado for consumptives, speaks as though Denver City were Colorado, and *vice versa*.

Now, this unintentionally misleading impression is calculated to do serious harm. During the late spring, and in summer and autumn, Denver and neighboring localities may be quite as pleasant and beneficial to the consumptive as localities south of the 'divide' that separates the waters of the Platte from those of the Arkansas.

But, during the cool and cold months, the Arkansas valley furnishes a very much better climate than can be found anywhere north of this divide in Colorado. It is scarcely necessary to state that the Arkansas valley furnishes all the necessary comforts of civilization, including convenient railroad transportation. As a rule, with rare exceptions, the consumptive should not sojourn in towns or cities, but rather in rural districts. But, should the consumptive prefer town or city life, Pueblo, Cañon City, and other places in the Arkansas valley, afford ample accommodation.

Having long been a sufferer myself, and having sought health in many portions of North America, I speak of the before referred to localities from observation and experience, and without prejudice or pecuniary interest. Q. C. SMITH, M.D.

Austin, Tex., Oct. 18, 1883.

[Dr. Fisk's article was written with especial reference to Denver, as the necessary data exist for that place, furnished by the records of the signal-service station: these do not exist for localities in the Arkansas valley. — EDITOR.]

A BIOGRAPHICAL HISTORY OF ASTRONOMY.

Heroes of science — astronomers. By E. T. C. MORTON, B.A., scholar of St. John's college, Cambridge. London, *Society for promoting Christian knowledge*, [1882.] 341 p. 16°.

FROM the title, 'Heroes of science — astronomers,' one might expect to find in this little book an account of the lives and a eulogium of the characters of the greatest astronomers, with some general indication of the nature of their discoveries. This expectation would be partially corrected by the opening paragraphs of the preface: —

"The primary object of this little book is, as its name implies, to give some account of the lives of the chief astronomers. But it is impossible to leave in the mind of the general reader any clear notion of their characters, without giving some account of their work. A good deal of space is therefore taken up with explanations of their discoveries; but, as this is only of secondary importance, the explanations are given in a popular manner, and no mathematics is introduced, except in ten pages (172–182), where a knowledge of the first book of Euclid and of the elements of algebra is assumed.

"The book may possibly be useful as an introduction to the study of astronomy, and, in this aspect of it, it is hoped that it may be helpful in two respects: First, by putting before the student the personal difficulties which the first investigators of the law