forms either in the rapidly changing phantasmagoria of delirium, or in the multiple vision of an over-stimulated brain. Exactly that which is chiefly conspicuous by its absence or its attenuation in all forms of hysteric disease, is personal identity, of which some of the pillars of the 'Society for psychical research' mistakenly hope to find the secret by studying the cases of those who pass their lives in disordered dreams.

SOME REMARKABLE GEMS.[1]

A FEW remarkable gems have been recently purchased by private buyers in the United States. One of these is a chrysoberyl cat's-eye weighing

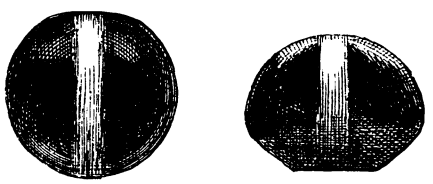

FIG. 1.

80¾ carats. Its dimensions are 23 mm. long, 23 mm. wide, and 17 mm. thick. The color, which is very even, is a superb brownish golden yellow, and the line is as even and distinct as is possible in a gem of such size. The cat's-eye hitherto awarded the palm is part of the 'Hope collection' included in the Townshend bequest to the South Kensington museum (fig. 2). This famous gem

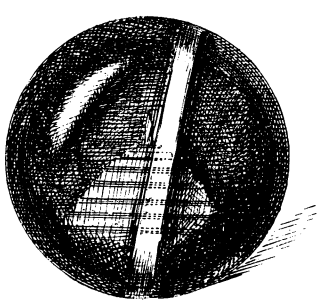

FIG. 2.

measures 35.5 by 35 mm. in its true dimensions (the Hope catalogue gives the length as two inches, but this is only the case when measured over the dome). It formed part of the crown jewels taken from the King of Kandy in 1815. The crystalline markings are so arranged that the lower half shows an altar surmounted by a torch. The line is not straight, but inclined about 15 degrees. The color is dark, and the line is not so strongly marked as it should be in a fine gem.

[1] From the Transactions of the New York academy of sciences, vol. v. No. 6.

Two of the largest known Ceylonese Alexandrites are to be noted. One of these weighs 28 23-32 carats, and its dimensions are 32 mm. by 16 mm. by 9 mm. In daylight its fine rich green color is tinged with red, but by gaslight it is a rich columbine-red, and scarcely to be distinguished from a Siamese purplish-red spinel. The other stone is the largest on record (fig. 3). It weighs

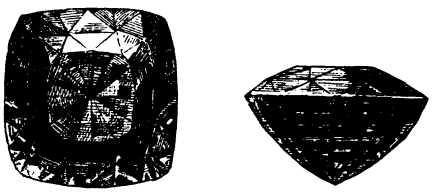

FIG. 3.

63⅝ carats, and measures 33 mm. by 32 mm. by 15 mm. It has a yellow grass-green color by daylight, but changes to a raspberry-red by artificial light.

The finest cut beryl (aquamarine) ever found in the United States is from Stoneham, Me. (fig. 4).

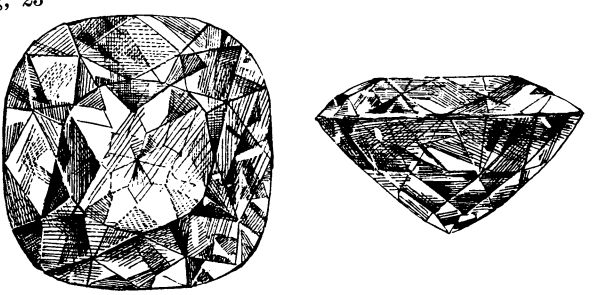

FIG. 4.

It measures 35 mm. by 35 mm. by 20 mm. It is a magnificent brilliant-cut, and weighs 133¾ carats. The color is a rich bluish-green, and, with the exception of a few minute hair-like internal striations, is perfect.

A ruby cut *en cabochon* is exhibited from Franklin, Macon county, N.C., showing somewhat the asteria effect. It is of good normal color, and quite free from flaws. Its dimensions are 5.5 mm. by 4 mm., and its weight 1 1-16 carats.

GEORGE F. KUNZ.

RACE AND LANGUAGE.

THAT the character of a people, like that of individuals, is indicated by their speech, is a common observation. We all understand that the French, the German, and the Italian languages have a certain consonance with the mental traits of the nations that speak those tongues; and this fact may reasonably lead to certain inquiries.

Why is it natural to Frenchmen, Germans, and Italians, to Malays, Mongols, Arabs, Azteks, and Zulus, to talk in a certain way? What is the origin of those traits of character which develop themselves in these different modes of speech? And what are the laws which govern this development? Speech, like every thing else, is subject to laws; and as zoölogists know, from the fossil skeleton of some mammal of the tertiary era, the kind of life which the creature led, and the food that it ate, so a philologist ought to be able to judge, from the vocabulary and grammar of an extinct language, what sort of people were those who spoke it.

The question is one of great interest to anthropologists as well as to philologists; yet it seems to have attracted, until now, comparatively little attention. An English — or, rather, if we must make the 'home-rule' distinction which he would perhaps disdain, an Irish — scholar has just given to the world an elaborate work, in which he has endeavored, with much philosophical acumen and a careful analysis of many languages, to solve this important problem, and to establish the principles which govern the formation of languages.[1] The epithet 'epoch-making' has been somewhat freely applied of late years; but it is not too much to say that the work to which the learned dean of Clonfert has evidently devoted many years of assiduous study and much profound thought will make a new departure in ethnological science, so far as this depends on language. So much may be affirmed, without adopting in all cases the views which are set forth in his work.

Mr. Byrne finds the most important quality which influences the structure of a language to be the greater or less degree of mental excitability in the people who speak it. His arguments on this point are ingenious and forcible, and his main example is a striking one. According to the greater or less persistency with which the thought of the speaker dwells on his subject will be the tendency to compactness or looseness in the framework of his speech. The aborigines of Africa and those of America offer a notable contrast in this respect, and the contrast is faithfully reproduced in their language. The slow, cautious, considerate Indian temperament is shown in the polysynthetic — or, as Mr. Byrne prefers to style it, the 'mega-synthetic' — character of the Indian languages, tending to combine many circumstances and qualifications in a single long and many-jointed word. On the other hand, however, the African quickness of thought, and lightness of mood, are displayed in the brief fragmentary words, and loose, disjointed phrases, which compose the ordinary speech of the tribes of that continent. Many examples are given in illustration of these opposite characteristics, both of mind and of speech, and the author may be fairly said to have proved his thesis.

He is not content with establishing the fact of this difference of character, and tracing to it the difference in the style of language. His next inquiry relates to the causes in which this difference of character originates. These causes he has no difficulty in finding in the different influences to which the inhabitants of the two continents are exposed. America lies, for the most part, in the temperate zones; and the portions which are within the tropics are either elevated into rugged tablelands, or covered, as in Brazil, with dense forests. The life of the people is almost everywhere one of hardship and anxiety, — the life of hunters, fishermen, and agriculturists, — requiring constant toil and watchfulness. In Africa, mainly a tropical country, the bountiful soil and genial climate make subsistence easy, and tend to produce in the people an impulsive and thoughtless character.

The author seeks to trace the operation of these and similar influences in the formation of the best-known languages in all parts of the globe. He submits each idiom to a minute scrutiny, and endeavors to point out the part which the habits of the speakers, and the natural influences that surround them, have had in producing their peculiarities of speech. If in any instances he has been unsuccessful, it is apparently because he has not sufficiently adhered to his own method, and has failed to take into account all the qualities of the human mind which would affect the language. An instance of this failure may perhaps be found in his attempt to account for the fact that in some languages the adjective precedes, and in others follows, its substantive. This difference in arrangement proceeds, he thinks, from the more or less careful attention which the communities who speak the languages are accustomed to give to the nature of substantive objects. But what reason is there for thinking that the Algonkin Indians, in whose speech the adjective precedes the substantive, pay more attention to the nature of things than the Iroquois, who place the adjective last, but are nevertheless, to all appearances, the more careful and industrious race? Can it be said that the artistic Italians, in whose language the adjective usually follows the noun, think less of the nature and qualities of things than do the Magyars, who place the adjective first? The true solution of this question seems to be found in the

[1] *General principles of the structure of language.* By JAMES BYRNE, M.A., dean of Clonfert. In 2 vols. London, *Trübner*, 1885. 8°.

influence of a powerful faculty which the author has omitted, in this and other cases, to take sufficiently into account, — the faculty of imagination. The English language teaches us a lesson on this special point. In ordinary speech the adjective precedes its substantive; but the moment the language rises into poetry, the order tends to be reversed; and the higher the imagination, the stronger this tendency appears.

Thus we have in Byron —

> "Adieu, adieu! My native shore
> Fades o'er the waters *blue*."

And in Scott —

> "Announced by prophet *sooth* and *old*,
> Doomed doubtless for achievement *bold*."

And still more strikingly in Milton's picturesque epithets —

> "Meadows *trim*, and daisies *pied*,
> Shallow brooks, and rivers *wide*."

We can understand how a vivid fancy may bring the object itself first before the mental vision, and that a momentary delay may be needed to discriminate and express its most striking qualities. There is no question, also, that the Iroquois, like the Italians, are a highly imaginative people, much given, as the reports of their councils show, to poetical improvisations. And finally, if we are to inquire to what influences both Italians and Iroquois owe their imaginative powers, we may perhaps find them in what Buckle would have called the 'aspects of nature,' — the mountains, rivers, forests, and seas which surround them.

Mr. Byrne is of opinion that the 'inflected' idioms — a class which he restricts to the Indo-European and Semitic tongues — indicate the highest grade of intellect in their speakers. Our pride of race would lead us blushingly to accept this compliment, until we find that we must share it with various barbarous septs, whom this pride of race would look down upon. Mr. Byrne, like other European scholars, — who cannot be altogether acquitted of race-prejudice in this respect, — has overlooked the fact that among the aboriginal tribes of America are several whose languages are as clearly inflective as the Greek or Arabic. Thus in Zeisberger's 'Delaware grammar' we find, as derivatives of *luen* ('to say'), *n'dellan* ('I say to thee'), *lellane* ('if I say to thee'), *lake* ('if I say to him'), and, in the imperative, *ill* ('say thou'), *luel* ('say on'), *lil* ('say to me'), *lo* ('say to him'), and the like. Pages might be filled with such examples of simple inflection, which, while they show clearly enough the polysynthetic cast of the language, have no more trace of the agglutinative cast than is to be found in any language of Europe. Duponceau, who translated this grammar sixty years ago, remarked, in reference to the views which had been expressed on the subject by Baron William von Humboldt, "The learned baron will, I hope, recognize in the conjugations of the Delaware verbs those inflected forms which he justly admires; and he will find that the process which he is pleased to call 'agglutination' is not the only one which our Indians employ in the combination of their ideas and the formation of their words." The Delaware is not alone. On the other side of the continent, in the languages of Oregon, pure inflections abound. Thus the Sahaptin, as is shown in the excellent grammar of the Rev. A. B. Smith, has the substantive verb, *hiwash* ('to be'), — used, it may be remarked, exactly like our own substantive verb, — which in the 'remote past' tense makes *waka* (*a* as in 'father'), 'I was,' and in the 'recent past,' *wâka* (*â* as in 'wall'), 'I have just been;' the only difference being in the change of the vowel-sound, precisely as in a Semitic conjugation.

What, then, shall we say? Shall we refuse to accept inflections as a proof of mental power? Or shall we more generously — and perhaps more scientifically — admit that they prove the barbarous speakers of these inflected American tongues to be equal in natural capacity to our own barbarous ancestors, the gifted inventors of the Aryan speech?

In spite, however, of such minor oversights, Mr. Byrne's work must be pronounced one of the most important and valuable among recent contributions to linguistic and ethnological science. The correctness of its main principles cannot reasonably be questioned; and the amount of information which the author has brought together and happily condensed, respecting a vast variety of languages spoken in every quarter of the globe, will make his treatise a treasury of reference for philologists.

H. Hale.

THEORETICAL OPTICS.

The wave theory of light was so firmly established by the labors of Fresnel from 1815 to 1827, that but few leaders in physical science continued to defend the Newtonian theory after that time. The only logical objection to the undulatory theory was its supposed incapacity to explain the phenomenon of dispersion, although Fresnel had, with an acuteness almost peculiar to himself, suggested, as early as 1822, that this might find its explanation in the fact that the molecules of a transparent substance are not separated by

Theoretische optik gegründet auf das Bessel-Sellmeier'sche princip. Zugleich mit den experimentellen belegen. Von Dr. E. Ketteler. Braunschweig, *Vieweg*, 1885. 8°.