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Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

THE SOUTH AFRICAN DOCTRINE OF SOULS.[1]

IN the second of two interesting papers on the manners, customs, superstitions, and religions of South African tribes (*Journal of the Anthropological Institute*, vol. xix. No. 3, and vol. xx. No. 2), the Rev. James Macdonald, who has had ample opportunities of studying the subject, has a good deal to say about the doctrine of souls which prevails among the aborigines of South Africa. It is extremely difficult, he explains, to discover what the people really believe about the spirit-world, so many and varied are the traditions relating to it. There are, however, certain outstanding facts common to all; and of these Mr. Macdonald gives a clear and instructive account.

All human beings are supposed to have souls, but their souls are not believed to be entirely confined to the body. A man's soul may, it is thought, occupy the roof of his hut; and, if he changes his residence, his soul does so at the same time. Mr. Macdonald takes this to be a loose and indefinite way of expressing "the belief that a man's spirit may have influence at a distance from the place where he is himself at any time." The people often use the word "zitunzela," from "izitunzi" ("shadows"), to express their ideas of human spirits and the unseen world generally; and this is "the nearest description that can be obtained." A man is constantly attended by the shadows or spirits of his ancestors as well as his own, but the spirit of one who dies without speaking to his children shortly before death never visits his descendants except for purposes of evil. In such cases magicians or priests offer costly sacrifices to prevent misfortune and death.

Great importance is attached to dreams or visions, which are supposed to be due to spirit influence. When the same dream comes more than once, the dreamer consults the magicians, who profess to receive revelations through dreams. If the dreamer has seen "a departed relative," the magician says, "He is hungry." Then a beast is killed; the blood is collected, and placed in a vessel at the side of the hut farthest from the door; the liver is hung up in the hut, and must not be eaten until all the flesh of the animal has been used. The "essence" of the food is "withdrawn" by the spirit during the night, and after a specified time all may be eaten except the portions which the magician orders to be burned.

Ancestor-worship is not only professed by the South African tribes, but "they actually regulate their conduct by it." Says Mr. Macdonald,—

"If a man has a narrow escape from accident and death, he says, 'My father's soul saved me,' and he offers a sacrifice of thanksgiving accordingly. In cases of sickness, propitiatory sacrifices are offered to remove the displeasure of the ancestors, and secure a return of their favor. Should any one neglect a national custom in the conduct of his affairs, he must offer sacrifice to avert calamity as the consequence of his neglect. When offering propitiatory sacrifices, the form of prayer used by the priest is, 'Ye who are above, accept our offering and remove our trouble.' In freewill offerings, as in escape from danger, or at the ripening of crops, the prayer takes the following form: 'Ye who are above, accept the food we have provided for you, smell our offering now burning, and grant us prosperity and peace.'"

Animals are not supposed to have souls, neither are inanimate objects; but spirits may reside in inanimate objects, and their presence has an influence on many customs and habits. A striking example of such influence was afforded during the rebellion of 1879, when Umhlonhlo, after the murder of the British Resident, was one day marching in a leisurely manner across country with his whole army. The forenoon was hot, and not a cloud was to be seen. Presently the magicians noticed on the horizon a peculiarly shaped cloud. "It rose rapidly in one mass, and 'rolled upon itself.' Its movements were intently watched till it approached the zenith and passed over the sun. This was an evil omen. For some unknown cause the spirits were mortally offended, and had come over the army in shadow at noonday. In grief and sorrow their backs were turned upon their children, and the result of this would be certain defeat and disaster. There was, however, no immediate danger. That morning's scouts had reported that there were no troops within many miles of their line of march, and they could repair to some sacred place to offer sacrifices and make atonement. While they were discussing which place to repair to for this purpose, the van of a small column of cavalry appeared unexpectedly over a rising ground. Dismay struck into every heart. The war minister urged his men to form into order of battle. No one answered his summons. He did his best to organize an orderly retreat, but in vain. Not a blow was struck, and every man took to his heels, making for the nearest hiding-place in mountain or forest. That army never re-assembled. Black-hearted fear utterly demoralized it."

Water or river spirits play a great part in South African mythology. They inhabit deep pools where there are strong eddies and under-currents. They are dwarfs, and are of a malignant disposition, which they display by greedily seizing on any one who comes within their reach. They are, of course, greatly feared; and the popular dread of them is shown in a way which has been known in many different parts of the world. Mr. Macdonald gives the following example: —

"Some years ago a number of Gcaleka girls were, on a fine summer day, bathing in the Bashee. One of them got beyond her depth, and began to struggle in the water, and cry for help. Her companions promptly raised the alarm, and two men working close by ran down to the water's edge. She was still struggling feebly, but to the onlookers it was a clear case of being 'called' by the river, and they made no attempt to save her. The body was recovered by the magicians the same day, when it was found she had been drowned in less than five feet of water. All this came to the ears of C. G. H. Bell, Esq., the English Resident; and he cited the parties, magicians and all, to appear before him in court. The two men not only admitted that they could have waded to the spot where they saw her struggling, but also said the water would not be 'more than breast deep.' They had made no effort to save her, as it would be 'improper and dangerous to interfere when one is called by the river.' Mr. Bell tried to argue them out of such absurd notions, but to little purpose, and finally came to the conclusion that 'six months hard' might be more effectual in eradicating superstition than all his philosophy, and six months hard it accordingly was."

Mr. Macdonald says there is no periodical process of purging or driving away spirits. Without the presence and aid of magicians, ordinary people dare not interfere with these mysterious powers, however malignant and destructive they may become. Although a man is guarded by the spirits of his ancestors, they do not protect him from demons or from wizards and witches. A certain

[1] From Nature.

measure of protection can, however, it is supposed, be obtained by the use of charms provided by magicians. On one occasion, when war was being carried on with England, the magicians gave the soldiers a charm against English bullets. It was the blue flower of a species of rhododendron. "Those who carried this talisman rushed forward against columns of infantry without a shadow of fear or hesitation; and only when men began to bite the dust in all directions did the nature of the delusion break upon the army, and panic ensue."

DEAF-MUTE INSTRUCTION.[1]

THE Sundry Civil Bill grants $52,500 to the Columbia Institution for the Deaf and Dumb, an increase of $5,000 over former appropriations.

President Gallaudet says, "The object of this increase is to enable the directors to enlarge the facilities afforded in the institution for normal instruction. For many years the graduates of our collegiate department have been in demand as teachers of the deaf in the primary schools of the several States. The demand for such teachers has far outgrown our limited supply; and as no normal school for the training of teachers of the deaf exists in this country, while several are sustained in Europe, it has been thought extremely desirable that the advantages for normal instruction existing in this institution to a limited degree should be increased."

In accordance with your suggestion, I submit herewith a brief statement of my reasons for opposing this grant, and trust you will allow me a hearing before your committee: —

1. The proposed normal department is a new departure, which will probably lead to largely increased appropriations in the future, diverting public money to an object foreign to the purposes for which the institution was established.

2. Such a training-school for teachers, supported by the National Government, will interfere with that healthy competition which now exists between rival methods of instructing the deaf.

3. In the Columbia Institution a foreign language (the sign-language) is used as the medium of instruction, whereas the rival methods employ the English language alone for this purpose.

4. The graduates of the collegiate department are, of course, deaf. The institution, therefore, proposes to train deaf persons to teach the deaf. This is a backward step, detrimental to the best interests of the deaf, and subversive of the very object for which the collegiate department exists.

5. Great efforts are now made to teach deaf children to speak; and articulation teachers are employed in all important schools for the deaf, with the exception of the collegiate department of the Columbia Institution.

6. The president of the Columbia Institution has stated that lack of funds alone prevents the employment of special articulation teachers in the National College. The increased apropriation of $5,000 now asked for would, if applied to this purpose, not only enable the collegiate department to employ ordinary teachers of articulation, but also a professor of elocution, who could carry up articulation work to the highest point of perfection attainable by the deaf.

7. I would gladly support an application for $5,000, to be expended for the employment of articulation teachers and a professor of elocution in the collegiate department of the institution, but I would strongly oppose an application for the purposes set forth by President Gallaudet.

REPORT OF PROGRESS IN SPECTRUM WORK.[2]

DURING the past year or two a great deal of work has been done in the photography of the spectra of elements and the identification of the lines in the solar spectrum, which it will take a long time to work up, ready for publication: hence I have thought that a short account of what has been done up to the present time might be of interest to workers in the subject. In the prosecution of the work, financial assistance has been received from the Rumford Fund of the American Academy of Arts and Sciences, as well as from the fund given by Miss Bruce to the Harvard Astronomical Observatory for the promotion of research in astronomical physics, and the advanced state of the work is due to such assistance.

The work may be summed up under the following heads: —

1. The spectra of all known elements, with the exception of a few gaseous ones, or those too rare to be yet obtained, have been photographed in connection with the solar spectrum, from the extreme ultra-violet down to the D line, and eye-observations have been made on many to the limit of the solar spectrum.

2. A measuring-engine has been constructed with a screw to fit the above photographs, which, being taken with the concave grating, are all normal spectra and to the same scale. This engine measures wave-lengths direct, so that no multiplication is necessary, but only a slight correction to get figures correct to $\frac{1}{100}$ of a division of Angstrom.

3. A table of standard wave-lengths of the impurities in the carbons, extending to wave-length 2000, has been constructed to measure wave-lengths beyond the limits of the solar spectrum.

4. Maps of the spectra of some of the elements have been drawn on a large scale, ready for publication.

5. The greater part of the lines in the map of the solar spectrum have been identified, and the substance producing them noted.

6. The following rough arrangement of the solar elements has been constructed entirely according to my own observations, although, of course, most of them have been given by others: according to intensity, calcium, iron, hydrogen, sodium, nickel, magnesium, cobalt, silicon, aluminum, titanium, chromium, manganese, strontium, vanadium, barium, carbon, scandium, yttrium, zirconium, molybdenum, lanthanum, niobium, palladium, neodymium, copper, zinc, cadmium, cerium, glucinum, germanium, rhodium, silver, tin, lead, erbium, potassium; according to number, iron (2000 or more), nickel, titanium, manganese, chromium, cobalt, carbon (200 or more), vanadium, zirconium, cerium, calcium (75 or more), scandium, neodymium, lanthanum, yttrium, niobium, molybdenum, palladium, magnesium (20 or more), sodium (11), silicon, strontium, barium, aluminum (4), cadmium, rhodium, erbium, zinc, copper (3), silver (2), glucinum (2), germanium, tin, lead (1), potassium (1); doubtful elements, iridium, osmium, platinum, ruthenium, tantalum, thorium, tungsten, uranium; not in the solar spectrum, antimony, arsenic, bismuth, boron, nitrogen (vacuum tube), caesium, gold, indium, mercury, phosphorus, rubidium, selenium, sulphur, thallium, praeseodymium; substances not yet tried, bromine, chlorine, iodine, fluorine, oxygen, tellurium, gallium, holmium, thulium, terbium, etc.

These lists are to be accepted as preliminary only, especially the order in the first portion. However, being made with such a powerful instrument and with such care in the determination of impurities, they must still have a weight superior to most others published.

I do not know which are the new ones, but call attention to silicon, vanadium, scandium, yttrium, zirconium, glucinum, germanium, and erbium, as being possibly new.

Silicon has lines on my map at wave-lengths 3905.7, 4103.1, 5708.7, 5772.3, and 5948.7. That at 3905.7 is the largest and most certain. That at 4103.1 is also claimed by manganese.

The substances under "not in the solar spectrum" are often placed there because the elements have few strong lines or none at all in the limit of the solar spectrum when the arc spectrum, which I have used, is employed. Thus boron has only two strong lines at 2497. Again, the lines of bismuth are all compound, and so too diffuse to appear in the solar spectrum. Indeed, some good reason generally appears for their absence from the solar spectrum. Of course, this is little evidence of their absence from the sun itself.

Indeed, were the whole earth heated to the temperature of the sun, its spectrum would probably resemble that of the sun very closely.

With the high dispersion here used, the "basic lines" of Lockyer are widely broken up, and cease to exist. Indeed, it would

[1] Open letter of Alexander Graham Bell to Hon. William B. Allison, chairman of the Senate Committee on Appropriations, dated at Washington, D.C., Feb. 11, 1891.

[2] From Johns Hopkins University Circulars.