

travel to the upper surface of the metal is so short that it does not have opportunity for complete reduction and slagging. Now iron-oxide can only remove silicon by being reduced by it, or by combining with already formed silica and thus preventing its reduction. Its appearance in the flame of the Clapp-Griffiths converter at a period when it is absent from that of the ordinary converter may indicate, not that it is formed more copiously, but that it is reduced and slagged less completely in the former than in the latter.

3. It has been attributed to the partial removal of the slag (whose silica might have been reduced had it remained as it does in the ordinary converter) during the converting operation. But the slag can be removed from the ordinary large rotating converters as well, and without serious expense or trouble, by turning them down 90° and skimming it at any desired stage of the process.

4. Finally, there are scoffers who say, "We believe that the removal of silicon bears the same relation to that of carbon in your converter as in the ordinary converter. Your analyses, apparently intended to show that your converter specially favors the removal of silicon, do not even point in that direction. The ductility of your phosphoric steels is indeed due to their being uniformly low in carbon and silicon. But this in turn is due to your admitting the blast so slowly towards the end of your operation that you can hit the point of complete removal of carbon and silicon more accurately than we can in our large converters with our present practice of blowing rapidly to the very end. But many feasible plans at once suggest themselves by which we may accomplish this in the ordinary converters. Creditable statements that at least one large scale Bessemer works is actually producing steel as uniformly low in carbon and silicon as yours, strengthen this belief."

It is too early to decide positively which, if any, of these explanations is the true one. If any of them be, it is highly probable that the excellent metallurgical results of the Clapp-Griffiths practice will be successfully imitated by the large Bessemer works.

The validity of the claim that the Clapp-Griffiths steel is superior to that of identical composition made in the ordinary converter can only be admitted on the production of far more conclusive evidence than has yet been offered.

HENRY M. HOWE.

#### ACTIVITY OF THE MIND DURING SLEEP.

IN connection with the present activity in psychical research, the following extract from the recently published 'Life of Agassiz' (Boston, Houghton, Mifflin & Co.) is of interest:—

"He [Agassiz] had been for two weeks striving to decipher the somewhat obscure impression of a fossil fish on the stone slab in which it was preserved. Weary and perplexed he put his work aside at last, and tried to dismiss it from his mind. Shortly after, he waked one night persuaded that while asleep he had seen his fish with all the missing features perfectly restored. But when he tried to hold and make fast the image, it escaped him. Nevertheless, he went early to the Jardin des plantes, thinking that on looking anew at the impression he should see something which would put him on the track of his vision. In vain,—the blurred record was as blank as ever. The next night he saw the fish again, but with no more satisfactory result. When he awoke it disappeared from his memory as before. Hoping that the same experience might be repeated on the third night, he placed a pencil and paper beside his bed before going to sleep. Accordingly, toward morning, the fish reappeared in his dream, confusedly at first, but, at last, with such distinctness that he had no longer any doubt as to its zoölogical characters. Still half dreaming, in perfect darkness, he traced these characters on the sheet of paper at the bedside. In the morning he was surprised to see in his nocturnal sketch features which he thought it impossible the fossil itself should reveal. He hastened to the Jardin des plantes, and, with his drawing as a guide, succeeded in chiselling away the surface of the stone under which portions of the fish proved to be hidden. When wholly exposed, it corresponded with his dream and his drawing, and he succeeded in classifying it with ease. He often spoke of this as a good illustration of the well-known fact, that when the body is at rest the tired brain will do the work it refused before." (p. 181.)

#### DEATHS FROM WILD BEASTS AND SNAKES IN INDIA.

From time to time the Indian government issues reports on the yearly loss of life by snake-bite and wild beasts,—reports which still show a frightful mortality from these causes, and afford significant evidence that the present precautions and exertions of the government in this direction still fall wide of their object. The latest intelligence in the *Gazette* states that in 1883 about 22,000 men died from the above mentioned causes. The returns from the district authorities can by no means be considered complete and satisfactory, since in consequence of the apathy of the natives and the almost universal belief among them in kismet, or predestination, many cases are not reported at all

Translated from *Das Ausland*.

and escape the knowledge of the authorities. It must be remembered also that the records of the government include only the cases occurring in British India, while there is no record whatever of the mortality from these causes in the independent states like Jeypoor, Gwalior, Rewah and many others, which are governed by independent rajahs or princes. The British system of dealing with wild beasts and harmful reptiles has not yet been introduced into these large districts; and the natives do not encourage by premiums and rewards the extermination of tigers, panthers, and various cat-like animals, as they do that of cobras and other poisonous snakes; whereas in British India their destruction has become a trade and means of support. Accordingly it happens that in the more distant parts of India which are not yet under British rule, the mortality from these causes is about as great as it was before the British supremacy over India.

Among the animals so destructive of human life, the tiger naturally stands first, and the report of 1883 lays to his charge not less than 985 deaths; and yet this animal, if it remains undisturbed and is not irritated, seldom attacks men. Tigers as a rule are cowardly, and are only too glad to steal away at the approach of man. In earlier times, and this is especially true of British India, when tigers were more numerous than they are at present, so-called man-eaters were by no means rare among them. They were so named because after once tasting human flesh they were said never after to eat other meat. At that time it was not unusual to hear of unused highways, of large stretches of land left uncultivated, and of abandoned villages falling into ruins, because the ravages of this fearful animal drove away the inhabitants. To-day these man-eaters are almost exterminated; if one is heard of, the attention of the authorities is soon drawn to his actions, a hunt is organized, and usually the animal is soon killed by the rifle of a European sportsman or the gun of some private hunter.

The question naturally arises, if the man-eaters are so rare, how does it happen that in a single year almost a thousand men lose their life from tigers? In the first place it cannot be doubted, although tigers eating only men are now fortunately rare, that a tiger if he is surprised in his lair, or comes face to face with a man in his wanderings, under the impulse of the moment and perhaps more from fear than any other reason, knocks the man down and then goes off. Cases of this kind frequently occur in wooded regions. A tigress with young is especially dangerous, and often attacks unprovoked any one approaching the place where her young are.

Again, herdsmen, or gwallas, as they are called in Bengalee, frequently lose their lives, if, in their exertions to rescue one of their herd from the claws of the destroyer, they too greatly expose themselves. In such cases the tiger is very dangerous; he has perhaps already tasted blood, and will usually give up his booty only after a struggle. If several men, arranged in a compact form, press upon him, as, ready to spring, he cowers on the ground behind the bull slain by him, he will often slowly and unwillingly retreat, but often, too, made furious by the sticks and stones thrown at him, and by the cries of his bold antagonists, he will break forth to the attack with enraged cry and blazing eye, and knock down one or more of them.

The chief cause of death by snake-bite is the almost universal custom among the poorer classes of natives of travelling in the hot season by night, without torches or lanterns. The European in India never does this; if he wanders by night about his bungalow or house, or in his garden, he carries a lantern, on his nightly journeys a burning torch, which snakes are known to avoid. To be sure, cobras are night animals; by day one seldom meets them. but after sunset they come out of their hiding places to seek food. A native usually goes barefooted, or wears a low shoe which protects neither ankle nor leg. In the dark he steps on or pushes against a poisonous snake, is bitten, or rather struck at, and probably by day-break lies dead at the side of the road.

The same careless custom of wandering after sunset through jungles which are inhabited by wild beasts of all kinds, is, although in less degree, a constant source of danger only too frequently involving death. As already remarked, a tiger, if he is left undisturbed, seldom attacks man in the daytime, but much oftener, if unprovoked, creeps away with an angry growl. This rule does not apply to encounters by night. All rapacious animals go at that time for prey, and appear to be fully conscious of their advantage over man in their sharper vision adapted to the thick darkness of night. Consequently there is for the traveller not only the greater probability of meeting dangerous beasts of prey if he traverses the forests by night, but the tiger and the other rapacious animals of the forest are then bolder and more to be feared; and although the tiger is by nature cowardly, yet under the protection of the darkness and the impulse of hunger, the sound of human voices in the stillness of the night may attract him nearer to the road, and a crowd of unarmed natives, passing only a few arms lengths from his lurking place, may arouse still further his wicked instinct. If the temptation prove too great, with

a single spring he alights upon one of the unfortunate travellers, and bears off his shrieking victim.

We learn from the *Gazette* that in 1883 not less than 47,487 cattle were destroyed by wild beasts, and it cannot be doubted that in this connection the tiger is especially destructive, and from this cause there is a very heavy tax on the natives dwelling in villages near large forests. A couple of royal tigers will probably within a month kill and consume ten or twelve grown oxen or cows, and a tigress with two or three almost grown young is perhaps even more destructive, for she takes pleasure not only in killing for the nourishment of her young, but will often kill several at a time out of pure malice.

There are tigers which live almost entirely upon large animals like deer and boars, and only rarely approach villages and human settlements; rather the majority of them depend for support upon domestic cattle, and that is not to be wondered at. The ruminating animals of the forest are shy, restless creatures, ever on the watch for danger, and so careful that a tiger, in spite of his cunning and noiseless approach, never succeeds in springing upon such animals and in successfully tearing them down. The tiger is more fortunate if he lies down in the neighborhood of a spring in the jungle, and there hidden, awaits the deer coming after a long hot day, half dead with thirst, impatient of the approach of night, and careless, in order to obtain the long-desired water.

But a tiger soon discovers that he can obtain his food with much less trouble and exertion, if he attacks herds. This is not only easier, if the herd pastures at the edge of a jungle,—quite unlike deer, which are always cautious, and in a trice in flight if they scent the enemy,—but a herd of cattle moved by fear will stand as if bound, with their whole attention directed to the striped robber, when crouching to the ground he quickly approaches to springing distance. Then, when flight is too late, the foolish animals try to escape, but with a single spring the tiger is among them, seizes his victim with his powerful grasp, tears it down, and kills it with one bite of his strong jaws.

The Asiatic lion, which is still found in a few provinces, in Cutch, Guzerat, and a few parts of Bombay, but is rather rare, was formerly considered by naturalists on account of a single characteristic peculiarity (namely, the almost entire lack of a mane in the males and his smaller size), as a species different from the African lion; but they are now considered identical. Little is known of the manner of life and the habits of the Asiatic lion. Hunters describe him as a dangerous animal when pursued; but if not provoked or

attacked, he appears, like the tiger, to avoid as far as possible, encounter with man; and apparently at nightfall he is not so bold and dangerous as the African lion. On the other hand, a lion, creeping along on the ground in the grass or in the undergrowth, even in comparatively open country, is much more difficult to distinguish than a tiger, because his brown spots resemble the color of the surroundings. It should be stated that it is a mistake to suppose that the lion in his natural state has the long flowing mane which we see in the caged specimens. Lions often live in close thorny thickets, and their manes, through the constant combing on the thorns, and the tearing in passing briery bushes, become thin and short, and lack the flowing abundance which pleases us in the caged animal. Like the tiger, the lion destroys cattle, but seldom or never eats men.

The panther and leopard in many things resemble the tiger; they seldom attack man, unless they are provoked, driven into a corner, or wounded, when, like all cat-like animals, they become very dangerous. Occasionally, though fortunately rarely, cases are reported when both animals show an unusual ferocity, and become man-eaters. For many experienced Europeans, and even for the native hunter, the Central Asiatic panther, a large, powerful beast, is far more dangerous than even the royal tiger, and both panther and leopard climb with agility, a power fortunately denied tigers and lions. Only a few years ago, it was reported that an English officer and a native hunter fired at a panther from the top of a tree, and wounded him severely. The panther climbed the tree, dragged the unfortunate Englishman down, mutilated him so that he died shortly after, and then mounted the tree again, and killed the hunter.

The panther, like the tiger, preys upon cattle; the leopard especially troubles the sheep and goats of the villagers, and often takes up his station only a few hundred feet from the village. Especially since the Indian mutiny, when the country was disarmed, and in mountainous regions, leopards have increased to an unusual degree. Formerly each village possessed two or three guns; now only certain people obtain permission of the government to carry arms, and consequently not enough animals are killed. The leopard has special designs against dogs, which he carries off zealously; often he will not attack a strong dog, but creeps up to him unnoticed and waits for a favorable opportunity to seize him, and to leap upon his neck, when he seldom looses his hold until the strength of the victim is exhausted. Notwithstanding the iron collar furnished with points which these valuable dogs wear, they are often

carried off by the leopards in the valleys of the Himalaya.

Among Indian beasts of prey there are three kinds of bears; two of them, the brown and black Himalaya bears, are found only in the mountains of northern India. The third kind, *Ursus labiatus*, is found only on the plains or in the lower mountain-passes, as in the Neilgherries of Madras. This last is not a flesh eater, but lives principally on wild fruit, various roots, grain, ants and honey. The two mountain bears, on the contrary, are undoubtedly beasts of prey and kill and consume as opportunity offers, sheep, goats and cows, a large number of cases occurring every year. Woodmen are often brought home frightfully torn and mangled, and at times cases are reported when a bear has attacked a man without the least provocation. A she-bear with young is more eager than any other animal to keep men from the neighborhood of her young; she will furiously attack any one who approaches them, and will pursue him, and wound him seriously with her teeth and claws; but a case has never been heard of, although often mentioned in books, where she engaged in close combat and attempted to crush her victim in her strong embrace. Indian bears are especially night animals, but they are frequently met with in the daytime, especially during the rainy season when the grass and jungles are thick and overgrown. At these times, and in distant places, where the forests are little travelled, one may easily come across the black bear seeking acorns under clusters of oaks, or bending down boughs to obtain the fruit, and it is not at all rare to see a bear trotting toward one in the open highway. But if he is only left alone, as a rule he will seldom trouble a man.

To complete the record another four-footed animal must be mentioned, namely, the bheria or Indian wolf, to which many men and animals fall victims. There is something especially abominable in his character, for he scarcely ever ventures on a man or woman, but makes children his prey. In some of the northern provinces of India, especially in Oude, and in some parts of Rohilkund, and also in the whole northwestern province of Bengal, the loss of human life by the wolf is very great. While the larger cat-like animals, as the tiger, lion, panther, and leopard, are night animals, the wolf, belonging to the dog tribe, is a day robber. At night he carries off little children from their beds, or from the side of their parents, if they sleep in the open air. The natives state that if a wolf has once tasted human flesh, he afterwards specially desires it, and touches almost no other food. A wolf usually lies in ambush in the immediate neighborhood of a village, in a corn-

field, or in a strip of sugar-cane, and here bides his time, and watches a company of naked children at play, until by chance one of them gets separated a little from his playmates and approaches the wolf. Then a sudden shriek is heard, and a brown object is seen fleeing in all haste; very rarely can such a child be saved, for the wolf generally strangles it long before help can be rendered. According to the natives, the Indian wolf is so sly and cautious that he is never caught either in ditches or in traps.

#### AN AFRICAN SMITHY.

In his account in the London *Graphic* of his journey to Kilima-njaro, Mr. H. H. Johnston describes a native forge:—

The Ma-Chaga are clever smiths, and forge all kinds of utensils, weapons and ornaments from the pig-iron they receive from the country of Usanga,



AN AFRICAN FORGE.

near Lake Jipé. The forge is but a pair of goat-skin bellows, converging into a hollow cone of wood, to which are added two more segments of stone, pierced through the centre, and ending in a stone nozzle, which is thrust into the furnace of charcoal. The bellows are kept steady by several