

CAMEL CAVALRY.

THE accouterments of the various belligerents now waging war in Egypt are of a curiously mixed character. The British have their squadrons of fine horses and revolving guns; the Arabs their ancient spears, with which they do fearful slaughter.

The Egyptian army is provided with a corps of camels on which armed men ride. A march of fifty miles a day is easily accomplished with these animals. Our engraving, which is from the *Illustrated London News*, shows the equipment of this curious branch of military service.

LATENT THOUGHT.

By D. Y. CLIFF.

REMARKABLE incidences of parallelism in thoughts are constantly occurring in everyday life, and in the wider field of human history, where whole races "think alike," and often it is the civilized world. Is it not a wonder a man is never born who thinks totally different, not only in style, but in logical sequence, to his fellow man? Nor is this nonsense, for I believe it is J. S. Mill who has said it is conceivable that there may be a species in the solar system with whom two and two make five.

It is worthy of notice, if we will think on the matter, how every thought we think is mentally expressed in our vernacular. Unpremeditated sentences spring out of our minds without an effort, but they must have been arranged internally before directing the vocal muscles. Is a thought spoken before it is considered, however swiftly?

I am inclined to think there is a continuous train of thoughts in our minds, of which we are not aware, either of its existence or its laws—a necessary result, so to speak, of the brain or nervous "molecular motion" or "vibration," and it is only when we require "to language" it that it is brought into activity. Surely mental activity must be constant, as we see with dreams; perhaps we are only aware of dreams in the interval between awaking and sleep.

I have heard of missionaries who became so used to the barbarous tongue in which they taught that they came to "think in it." Is there latent thought? This latent thought would naturally be hereditary in a family, a race, a nation, or even the human species, and would do away with any astonishment that no logical "confused" man is born. The brain, being part of the body, cannot be exempt from the same causes that rule the body—evolution, correlation, etc. Of course this latent thought is a very dim, vague sort of a thing to define.

It would seem only certain that a constant relation, or proportion, is generally a law of thought. For instance, two persons look at a color, and call it "red." How are we to prove that they both see identically the same effect? Each always sees one constant result, and he has learned to call it "red," and so with the other person, although it may really be green to one and blue to the other, in their relative individual judgment. This of course is no detriment to our thinking, but it shows there may be wide differences unknown to us. Perhaps every one of us has a different picture of a man; we have only learned things relatively to ourselves. We pity the poor frog who, with a partially brainless skull, answers with a meaningless croak the stroke on his extremities; but are we much better—i. e., any different—in principle? It is but a more complex affair. We get a kick, and our anger is roused, all our nervous system is disturbed, and the tongue utters harsh sounds, like the frog croaked. Then there is the repressive power of the human mind; but animals have that too.

In this latent thought lies the nature that maketh all the world akin; how alike is every human emotion! Is there any difference in the love language of a savage and an Englishman?

There are certainly traits of (latent?) thought in a nation's literature. How dull we find Oriental history, until it has time after time got thoroughly imbued with a European way of telling its story. Strange it is, too, what the effect of style is on writers; extracts from dry books seem to keep dry; writers on Oriental history (e. g., China) seem unable to throw off its tone. We have literal translations of Chinese stories; what "stuff" they seem to the English mind! And yet often they approach very near. Colenso gives a Gala religious rhapsody; it is as good as a Psalm (which are, by the bye, the product of a very different stage of civilization to the present).

We cannot help being struck by the art productions of the Aryan, Semitic, or Hamitic division of the human race. The difference is most striking. One would venture to suggest that the sculptural remains of ancient nations might be taken as decisive testimony as to their respective races.

The stiff, bard drawing of the old Egyptian, Assyrian, etc., can never be confounded with the more exact conformity to the natural shapes of the Europeans, and most decidedly stamps this relative "latent power" of the respective races. And here it is not entirely "surroundings" that have formed their ideas of beauty—a principle one of your correspondents argued for in a former number. This might explain the very peculiar drawings of the Chinese or Japanese, but cannot be applied to the ancient world, unless we unfoundedly suppose that their forms—contours of limbs—were as harsh as designed, which is absurd, and would not have escaped the notice of the early European historian. The hideous sculptures of Indu gods can hardly be the work of an Aryan race. Nor is it an accidental turn of thought, like the nepotism of Travancore, Cochín, etc.

The human mind cannot conceive anything, as Mr. Cook, of Boston, has shown, and the "why?" of that question is only to be answered on the hereditary principle, our ancestors not being able even to guess the confines of space and time; yet still there are moments when we fancy we have an idea—but the world is in our brain.—*Jour. of Science.*

TOBOGGANING.

TOBOGGANING, says a Montreal correspondent of the *New York Sun*, is studied like a science. Originally, any hill with a straight road and a good slant would do for the sport; next, the tobogganers began to build big mounds of snow on top of the hills upon which to give their boards a strong and swift start. But all that is too old fashioned for 1884. The rich snowshoe clubs now go into tobogganing regardless of expense. Having selected a good hillside, with a straight roadway a quarter of a mile long, they build long, slanting scaffolds at the top of the hill, fifty feet to seventy feet from the ground at the upper end of the incline, and with standing room at the top for scores of tobogganers and ladies. The inclined front of each of these scaffolds is boarded down to the point at which it meets the earth. Its

surface is then divided into three, four, or five slides by ridges of snow, and these ridges are continued down the hillside. But snow is not good enough for the modern tobogganer to slide upon. It is only used for these ridges, which serve to keep the toboggans apart, and to prevent them from running into one another. The slides themselves are now coated with ice, made by pouring or sprinkling water between the ridges. The snow on the hillside is also wet and frozen, so that the whole quarter of a mile of hillside is a sheet of ice.

A high ridge of snow separates the slides from the path up the hill, and along this path the men drag their queer sleds, while the women gladly follow, all asserting that each time they climb the hill and the flight of easy steps up the scaffold they feel fresher and more eager for the sport than on the previous journey. Once on top of the scaffold, the tobogganer puts his toboggan down upon the flat platform, with its curved front end just over the edge. The girl who is to make the journey either puts her feet or her knees under the dashboard, according to how many are going down and how much room there is. The next passenger, if a girl, sits tailor fashion behind the first one; or, if a man, puts his legs on either side of the forward girl. If the riders are well acquainted and are enthusiastic tobogganers, the girl won't mind her companion putting his feet in her lap. It is the best and safest thing he can do, for a toboggan is thin and lies flat on the ice, and if a badly managed foot should touch the ice ever so lightly, it would send the toboggan flying out of its course. When all are ready, the passengers having got firm holds upon the little side rails at the edges of the slender board, the steerer throws himself forward upon the toboggan, so that he rests on one haunch upon it, with one leg free to steer with. The force of his movement and weight of his body send the frail board flying over the edge of the scaffold and down the steep ice-clad planing.

It is like falling from the roof of a four-story house. You feel yourself and the strip of birch veneer beneath you loosened from the earth and flying like a meteor toward the black crowd of spectators far below you at the foot of the hill. The very manner in which the toboggan grazes the slide makes it less reassuring than if it did not touch at all. There is a roar, a blast of intensely cold wind, a flash of the white walls of snow on either side, and then a comforting bump and grating as the less steep ground is touched. After that the supple board bends beneath its load in obedience to every undulation and slight hummock in its path. The quarter of a mile is made in thirty seconds. As the toboggan begins to slow up, the greatest danger is at hand. A man seizes its dashboard and at the same instant raises the ladies from their places and shouts, "Quick! quick! to the right!" or "Jump to the left. You haven't a second!" for other toboggans are rushing toward you on the same slide or are approaching on other slides the route you must take to the side of the road.

Accidents are frequent, but not often serious. Toboggans run into one another, but if both are free no harm is done. Frequently they lurch into the crowd that always gathers at the foot of the hill, and one sled will upset half a dozen people at a time. The worst mishap this year was to a young lady. She was in the care of a skillful steerer, but when the toboggan struck a big dog that ran out to bark at it, his skill was useless. The toboggan shot into the air, and he and the lady fell upon the ice and bowled along at thirty miles an hour. The young man said that she had fallen face downward, and he had tried to turn her on her back but could not. Part of her face was skinned, and she will be most horribly scarred for life.

One snowshoer has got a steel toboggan, but it is no faster and not half so safe as the birch ones. It would be a terrible engine of destruction in case it met with an accident. The best innovation is the hickory toboggan, that carries seven persons, which appeared on one of the slides just before carnival week. It is faster than a dream. Toboggans were always made by the Indians until very recently a factory was established here by white men. The Indian toboggans are even yet considered the best. They cost from \$3.50 to \$6, and weigh less than ten pounds without the mattresses that many use. The toboggan was originally meant for the transportation of heavy burdens over soft snow. It will not sink into snow as a sled would. But if a Yankee boy should bring a Connecticut double-ripper up here and start down one of these artificial glaciers it would go with the swiftness of a falling star, and it would not stop at the foot of the slide, but would dart on through Montreal and out upon the St. Lawrence at the foot of the mountain before it would begin to slow up.

PHOSPHORESCENT BRICKS.

At a recent meeting of the Academy of the Natural Sciences, Philadelphia, the first communication which engaged attention was one on a curious phosphorescent variety of limestone from Utah. The miners had found that when struck with a pick this rock gave out a lurid red light, lasting from half a second, when merely touched, to a much longer time, as the result of a blow. They had, therefore, named it the hellfire stone. On examination it proved to be an almost perfectly pure carbonate of lime, with but a slight percentage of impurities. It is a loose grained, white, crystalline limestone, the grains of which are but slightly coherent, giving the rock the appearance of a soft sandstone. It crumbles easily between the fingers, forming a coarse sand. Phosphorescence is developed when the rock is either struck, scratched or heated. When heated in a glass tube over a flame it glows with a deep red light, which lasts for a minute or more after withdrawing the flame. After two or three heatings the phosphorescent property disappears.

A search through the collection of the Academy for limestones having similar properties resulted in finding specimens from Kaghberry, in India, which glowed with a strong yellow phosphorescence when heated, although no such effect was produced by scratching or striking. It was of great interest to find that the Indian limestone alone of all in the collection had the precise external characters of that from Utah. This similarity is more than a coincidence. It confirms Becquerel's view that phosphorescence depends upon physical rather than chemical conditions. Professor Lewis had been fortunate enough to observe the rare phenomenon of the phosphorescence of snow, having seen a snow covered Alpine mountain shining at night as though illuminated by moonlight. This beautiful appearance lasted for about half an hour only, and was confined to a single mountain. Here again the phosphorescence, although of quite a different character from either of those belonging to the limestones, was purely physical, depending upon the assumption of a certain crystalline condition by the snow. The phosphorescence of hellfire rock is probably dependent upon a distur-

ance of its loosely aggregated crystalline particles, whether such be produced by percussion, friction, heat, or decrepitation.

EARTHQUAKES AND BUILDINGS.

A COMPLETE discussion of the effects which earthquakes produce upon buildings would form a treatise as useful as it would be interesting. Not only would it involve a discussion of the practical lessons to be derived from the actual effects of earthquakes, but it would include deductions based on our present knowledge of the nature of earthquake motion. Such knowledge is obtained from the records of seismographs.

In the following few notes I intentionally overlook this latter portion of the subject, and confine myself to a few of the more important practical conclusions respecting the effect of earthquakes on buildings, which may be of value to those whose mission it is to erect buildings in earthquake countries.

With regard to the situation of a building, it is sometimes observed that after an earthquake it is the portion of a town situated on low ground which has principally suffered, while adjoining portions on hills may have practically withstood the disturbance. In 1855 this was the rule governing the distribution of ruin in Tokio. The reverse, however, has been the rule in Yokohama. Speaking generally on this point, it may be said that there is no universal rule—each small area in an earthquake region having its special rule. As a site for a building, theory seems to indicate that soft earth or marshy ground, which would absorb much of the momentum communicated to it, and therefore act as a buffer between a building and a shock approaching through other strata, would prove a safe foundation. This seems also to have been an old opinion, for we read that the temple of Diana was built on the edge of a marsh to ward off the effects of earthquakes; but experience has repeatedly shown us, as in the case of Tokio and Manila, that swamp-like ground, as an earthquake palliative, has but little effect. On the other hand, hard, rocky strata, where the amplitude of motion is small, but the period quick as compared with the motion in the inelastic material of the plains, has, as was markedly illustrated in 1755 at Lisbon, and in 1692 at Jamaica, proved the better foundation. Places to be avoided are the edges of cliffs, scarps, and cuttings. For emergent waves, these are free surfaces, and from their faces materials are invariably shot off, much in the same way that the last car in an uncoupled train of carriages may be shot forward by an engine bumping at the opposite end.

As foundations for a building there are two types. In one, which is the European method of building, the structure is firmly attached to the ground by beds of concrete, brick, and stone. In the other, which is illustrated in the Japanese system of building, the structure rests loosely on the upper surface of stones or boulders. As an indication of the relative value of these two forms of building, it may be mentioned that in Yokohama, in 1880, many of the European buildings were more or less shattered, while in the Japanese portion of the town there was no evidence of disturbance.

The houses, like the foundations, are also of two types. In the European house built to withstand earthquakes, of which there are examples in Tokio and San Francisco, and for which in America patents have been granted, we have a building of brick and cement bound together with hoop iron and numerous tie rods. A building like this, which from time to time is jerked backward and forward by the moving earth, to which it is secured by the firmest of foundations, is expected to resist the suddenly applied and varying stresses to which it is exposed, by the strength of its parts. This type of structure may be compared to a steel box, and, if its construction involves any principle, we should call it that of strength opposing strength. Some of the buildings in Caracas, which are low, slightly pyramidal, have flat roofs and which are bound along their faces with iron, belong to this order. These so-called earthquake-proof buildings, with the exception of their chimneys, have certainly satisfactorily withstood small earthquakes in Japan. As to how they would withstand a disturbance like that at Casamicciola is yet problematical. Unfortunately these structures are very expensive.

The second type of building may be compared to a wicker basket. This is certainly as difficult to shake asunder as the steel box type, and at the same time is not so expensive. The Japanese house belongs to this type. It is largely used on the west coast of South America; and in Manila, since the disaster of 1880, it has rapidly been replacing the heavy stone form of structure. Briefly, it is a frame house with a light roof of shingle, felt, or iron. As put up in Japan, its stability chiefly appears to depend on the fact that it is not firmly attached to the earth on which it rests, and that its numerous joints admit of considerable yielding. The consequence is that, while the ground is rapidly moving backward and forward, the main portions of the building, by their inertia and the viscous yielding of their joints, remain comparatively at rest.

A house that my experience suggests as being aseismic, and at the same time cheap, would be a low frame building, with iron roof and chimneys supported by a number of slightly concave surfaces resting on segments of stone or metal spheres, these latter being in connection with the ground. Earthquake lamps, which are extinguished on being overturned, would lessen the risk of fire, while strong tables and bedsteads would form a refuge in case of sudden disturbances.

In earthquake towns the streets ought to be wide, and open spaces should be left, so that the inhabitants might readily find a refuge from falling buildings. Brick chimneys running through a wooden building, unless they have considerable play and are free from the various portions of the building, are exceedingly dangerous. In consequence of the vibrational period of the house not coinciding with that of the chimney, the former, by its sudden contact with the latter when in an opposite phase of motion, almost invariably causes an overthrow. In 1880 nearly every chimney in the foreign settlement in Yokohama was overthrown in this manner, and the first alarm inside the houses was created by a shower of bricks falling on beds and tables. Since this occurrence the chimneys in Yokohama have had more or less play given to them where they pass through the roofs.

Chimneys with heavy tops, like heavy roofs, must be avoided. Another point requiring attention is the pitch of a roof. If this is too great, tiles or slates will be readily shot off. Archways over openings should curve into their abutments, otherwise, if they meet them at an angle, fractures are likely to be produced.

If for architectural reasons, or as a precaution against fire, it is necessary to have buildings that are substantial, their upper portions ought to be as light as is consistent with the