

limestone at the time it was deposited. He therefore regards the magnesia as indigenous.

It has appeared to the writer that the agents which produced the mottling might be closely bound up with dolomite formation on an extensive scale, and he has accordingly given the phenomenon careful attention in connection with his studies on the origin of dolomite. In the occurrences of mottled limestones observed by him the dolomite patches follow fucoid markings similar to those described by Wallace in some instances, but in others they are very irregular and show no guiding influence. For the origin of both types it seems necessary to adopt an alternative hypothesis; namely, that the magnesia was subsequently introduced into the limestone from without, and that the mottling has resulted from the selective replacement of fucoid markings in the one case, and from the spreading out of the alteration from certain favorable centers in the other. Consistent with this view are the following facts:

1. The existence of unaltered fucoid markings containing less than two per cent. of magnesium carbonate in association with dolomitic ones.

2. The association of both types of mottling with dolomite seams and other evidences of imperfect dolomitization.

3. The graduation of mottled beds into beds which are uniformly dolomitic, both laterally and vertically.

4. The existence of every gradation between limestone showing incipient mottling and true dolomite.

Thus it appears to the writer that all examples of mottling examined by him represent an incipient stage in the process of dolomitization, and it is believed that many dolomites have passed through such a stage in the progress of their formation. Here, then, we have a clue to the origin of all those masses of dolomite with which such mottling is associated.

With regard to the time of the alteration which produced the mottling, there is convincing evidence that it took place in the majority of cases prior to or contemporaneously

with the recrystallization of the limestone. Several features lend support to this conclusion; namely, the development of perfect rhombs of dolomite showing no growth interference effects in the limestone about the borders of the dolomite patches; the occasional presence of zonal growths of dolomite and calcite; the tendency of the dolomite areas to spread out uniformly in all directions as the dolomitization proceeded rather than to develop veinlets; and the association of the mottling with imperfect dolomitization effects along original lines of weakness such as bedding planes rather than along secondary structures such as joints or fractures. It seems probable, therefore, that the mottling was produced while the limestones were still beneath the sea, and that the sea water contributed the magnesia.

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SERPENT INSTINCT IN MAN

TO THE EDITOR OF SCIENCE: In the very entertaining and instructive work by Col. Wm. C. Gorgas, "Sanitation in Panama," the author in the concluding pages of the book gives expression to certain philosophizing ideas relating to the earliest period of the existence of the human race, and makes the point that before the discovery by primitive man of fire and clothing his habitat must have been confined to that part of the earth that lies "between the tropics of Cancer and Capricorn," or within narrow limits outside of that region.

There has been much speculation concerning the focus from which the world's population became diffused over the earth's surface, and, at least as far as regards the white peoples of Europe and Asia, the consensus of scientific opinion has fixed upon some locality in central Asia as the probable focus of origin, though the exact or approximate locality seems not to have been defined.

In the writer's reflections along this line there has presented itself to his contemplation one very pronounced and mysterious mental attribute still pertinaciously clinging to the white race at least, which seems to carry evi-

dence corroborative of the above conclusion, pointing, however, more specifically to India as the location of man's early development.

Reference is made to the general prevalence of a deep-seated abhorrence of the serpent and all serpent forms among the white race. This abhorrence of serpents is really a deep-seated animal instinct, which has survived long after the conditions that gave it origin.

Rational persons who are informed on the subject know that the great majority of the snakes to be encountered in this country are entirely harmless, being without venom or fangs; and indeed the writer has determined, to his own satisfaction at least, that in this particular region the only one of the snake family that is a menace to human life is the now rarely encountered *Crotalus horridus*, using the term in a generic sense.

And yet, any intelligent person when unexpectedly brought into close proximity to any kind of a snake, large or small, venomous or non-venomous, or even a semblance of a snake, is suddenly seized by a panic of horror and fear, with an impulse to spring away out of the serpent's reach as quickly as possible in a sort of blind terror.

The probable origin of this instinctive horror of serpents that still dominates the mind of civilized man was during the countless generations when early man was slowly climbing up from his animal ancestry to his present eminence as *Homo sapiens*. Being without fire and without clothing or shelter, he was peculiarly defenseless in an environment beset by deadly serpents, against this, probably the greatest danger and greatest menace to racial survival that he had to encounter. Hence his instinctive horror of the serpent form.

The idea that India was the "cradle" of the white race at least, with its serpent environment threatening racial existence for a very long period of its primitive development, appears to receive some degree of confirmation from the fact that among the inhabitants of India at the present time the annual mortality from attacks of serpents exceeds twenty thousand, notwithstanding the efforts of the British authorities to suppress the evil.

The serpent instinct in man has a close analogy in a similar instinct that characterizes the domestic horse of the present time, to which allusion has been made by writers on the subject. It is a familiar fact to every one who has to do with horses, the proneness of the horse to exhibit an insane and uncontrollable fear of any unfamiliar wayside object. Indeed the phenomenon is such a commonplace that probably very few persons have given a thought in explanation of what appears to be a wholly unaccountable mystery.

The suggestion that has been offered with compelling force to account for this curious horse instinct is on parallel lines with that offered above to account for man's serpent instinct, both of which in the nature of animal instincts are intense and deep seated, and have long survived the conditions that gave rise to them.

In the case of the horse, for a very long period of his racial development he was subjected to one danger exceeding all others in magnitude by which racial survival was constantly threatened. This danger was embodied in the predacious beasts that infested the horse's early environment, mainly of the feline family, that lay in wait concealed by bushes or other cover for the opportunity to spring upon him and devour him. The horse had no means of defense against this danger except alertness in eluding the spring of his enemy and fleetness of foot to escape pursuit. The individual horses that developed these qualities most highly survived, while those that failed to reach an efficient standard fell victims to their enemies.

And we now see, thousands of years after the domestication of the horse, that he suddenly falls into a senseless panic and flees at breakneck speed from an imaginary danger behind him, heedless of real dangers ahead which not infrequently cause him a broken neck.

The instinctive fear of imaginary dangers in the horse, and the same kind of fear of serpents in man, appear to have had a similar genesis in the early experiences of both races.

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