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RECLAIMING THE DESERT PLACES.

The explorations of French engineers have proved that the surface of the great Desert of Sahara is below the level of the ocean, in fact that it is the bottom of an ancient fresh water lake which has dried up by gradual changes in the surrounding levels, the streams which once supplied it now going directly to the ocean. It has been therefore suggested to change this desert back into a lake, and in this way to alter the whole climate of that country. This would, of course, create a moist atmosphere in place of the burning hot, dusty whirlwinds which are the curse of that region. There are, however, no rivers to be turned into the basin; and the artesian wells, successfully bored by the French, which create oases in the desert around them, give too insignificant a supply for such a great purpose. It has, therefore, been proposed to make a channel to the ocean, and lead the ocean water into the desert; but in consequence of the vigorous evaporation in that latitude, the water, when once spread out over any considerable surface, would probably disappear as quickly as even the largest sized canal could pour it in.

The Caspian sea, which is situated below the surface of the ocean, evaporates the waters of the Volga as rapidly as that colossal river, the largest in Europe, is able to pour them in. The water of the Volga is fresh, containing only a small percentage of salts; but this small amount of salt remains in the Caspian sea, while pure water only is abstracted by evaporation; thus the sea is very salt, and becomes more so every year. If now the collection of fresh water, in a closed lake, from which there is no exit but evaporation, ends in making a salt lake in a cold climate, the introduction of sea water to form such a lake under a tropical sun, as proposed for Sahara, would result in making a huge salt pan, which would gradually fill up with solid salt, till it reached the level of the supplying ocean; and we should only have transformed the dry sandy plains of the desert into dry salt plains, and which of the two would be the wore is a matter for discussion.

We think that a continuation of the French system of boring artesian wells in all available spots is the best method of reclaiming the desert. Many of these wells have already been completed, and it is indeed touching to read the description of the joy and religious enthusiasm of the natives when they see, for the first time, a bountiful supply of fresh cool water poured forth from the bowels of the earth in spots where never before was water seen for miles around. The creation of an oasis in the desert is the immediate consequence of each well; and in the course of years the dreadful Sahara may be so profusely clothed with artificial oases that most of its terrors will have passed away.

As to our American deserts, recent explorations and surveys of the great desert of the Colorado river have shown that it also was the bottom of a lake which has dried up, because the river has cut its channels in the rocks, through which it flows to the ocean, so low down (from 4,000 to 6,000 feet) that the lakes, formerly connected with and supplied by the river, lie now far above its present level. These lakes have for centuries collected at their bottoms the deposits of the Colorado river; and the now exposed surface consists, therefore, of an alluvial soil of extreme fertility (containing potash, soda, lime, and phosphates), which, however, cannot produce any crops on account of the total absence of moisture. The whole region is indeed a desert like that of Sahara; and like the latter, a portion of it lies below the surface of the ocean, as proved by barometric observations. It is believed that the waters of the Gulf of California formerly extended some 175 miles further inland than they do now, that subsequently the delta deposits of the Colorado (which were enormous, considering the deep channel which it has hollowed out for itself) formed a dam in the sea 175 miles from the shore, finally enclosing a sheet of water, which then dried up and now forms that part of the desert which is lower than the ocean.

It is proposed to lead the waters of the ocean into this low portion, so as to inundate it, and increase the atmospheric moisture in that region; and it appears that the plan is feasible, at a comparatively small cost; but one objection is that then a large portion, some 30,000 or 40,000 square miles, which otherwise might be made productive, would be sacrificed; and this plan is also open to the same objection as that of inundating the Sahara with sea water: it would end in the creation of an enormous salt pan. We prefer the other plan which has been suggested, irrigation from the upper part of the Colorado river, which, to be sure, would cost much more, but would reclaim all the highlands of this desert. The geologist of Williamson's expedition, Mr. W. P. Blake, points out that, by cutting a canal or deepening a certain small river low enough, so that the water from the Colorado could enter it at all seasons of the year, a constant and plentiful supply of water can be furnished to the interior of the desert and used for irrigation, while the surplus will fill the low portions with fresh water, find its exit to the Gulf by a pass to be constructed, and also establish navigation from the Gulf of California to the interior of the great lake. A thorough survey is needed, and also experiments in boring artesian wells: which, without doubt, would here be as successful as in the African desert, as is indicated by indisputable geological evidences.

A NEGLECTED SOURCE OF FOOD.

Ages ago when our forefathers were worshippers of Odin and the rest of the dead divinities of Northern Europe, horse flesh was accounted a delicacy fit for the gods. When a warrior died, the "funeral baked meats" were carved from his slain charger; and in all religious celebrations the horse figured, as the bullock did in the sacrificial feasts of other nations. Thus horse flesh and paganism were found to be inseparable when the Germanic and Scandinavian tribes were christianized by royal proclamation. The new made christain could not begin a dinner at which his favorite meat appeared without relapsing to his ancestral religion and going through the entire round of pagan rites with which horse flesh had been so long associated. As a natural consequence, horse flesh became not only synonymous with paganism but one of its defenses—we should have said bulwarks if the sound had permitted. Against it the bulls of the church were hurled, and its use was prohibited under pain of eternal damnation. Gradually, as christianity gained ascendency, the obnoxious meat passed out of use, and in process of time it came to be regarded by Europeans as "long pig" was by the christianized descendants of man-eating Fiji islanders, with an abhorrence as intense as the original liking had been.

Subsequent generations have inherited the prejudice and forget its origin. To this day the multitude stand ready "to cry unclean" the moment horse flesh is mentioned as an article of food, though it would puzzle them to give one substantial reason for so regarding it.

The truth is that no meat can be cleaner. The horse is one of the nicest of feeders, and as choice in his drinking as in his diet; and, as has been abundantly proved by the experience of modern Europe, where horse flesh has lately become an important element in the food supply, the meat which we reject is at once wholesome, nutritious, and nearly if not quite as savory as beef. As we are no longer in danger of relapsing into paganism with the taste of it, the only sanitary reason, moral or otherwise, for avoiding it is done away with.

There remains the economical reason for its disuse arising from the fact that good horses are worth more for other purposes. But the time comes when the best of horses ceases to be profitable for service. What then?

Occasionally a favorite animal is provided for in his old age and allowed to end his days in all the comfort that Nature will permit. The majority, however, are turned over to the tender mercies of the cruel to be used up, more or less speedily, in rough and ill requited labor. To guard their favorites from this unhappy end, it is becoming a common practice among considerate people to shoot their horses when no longer fit for the carriage, though they may still be far from worn out. Of the nine million horses in the United States, a million might fitly be disposed of in that way every year, to make room for younger and more serviceable animals. In other words, our food supply might be augmented by something like a thousand million pounds of good meat annually. We throw it away—for a prejudice!

That this prejudice will be overcome in time, we have not the slightest doubt. The tendency of our civilization is to multiply food consumers while lessening the relative number of producers. As a natural consequence we must be more and more careful to avoid unnecessary waste. Every available source of wholesome food must be husbanded, and this among them. Unfortunately those who would be most directly benefited by the addition of horseflesh to our lists of meats are just those whose prejudice against it is most intense. Here, as in Europe, it must first gain a place on the tables of the well-to-do.

Perhaps as simple a plan as any for effecting this would be the following: We have noticed the growing custom of shooting horses when their term of profitable service has come to an end by age or accident. Instead of burying the carcasses or giving them to the renderer to be converted into soap grease and fertilizers, the flesh might be properly dressed and distributed among those who, from curiosity or conviction of its wholesomeness, might desire to give it a trial. If pains were taken to announce this intention before hand, and to prove to intending eaters that the horses were in good condition and free from disease, there would be little difficulty, we imagine, in disposing of the choicer cuts. All that is required is a beginning, and this course would ensure it with the least amount of trouble and cost.

Who will make the experiment and report the result?

THE ASTRONOMICAL CONDITIONS OF LIFE.

Spectrum analysis, confirmed in so many particulars by the chemical analysis of mereorites, has familiarized us with the idea that all the bodies of Nature, the planets of our system as well as the suns most distant from us, are composed of the same elements, animated by the same physical forces, submitted to the same chemical laws, and present all the essential characteristics of the elements of which we are formed, even to the most delicate and minute details. Since therefore these same forces act under our eyes as essential agents of life, we are naturally led to consider the conditions of organic existence on our globe as applicable to the circumstances of other spheres. If in brief our earth is inhabited, why not the other orbs which fill up space, seeing that the same matter is everywhere present?

The caption of this article is also the title of a valuable paper lately published by the eminent French astronomer Faye, in which he considers the problem briefly outlined in the foregoing paragraph. He reviews the conditions of other worlds, as demonstrated by spectroscopic and various other modes of scientific investigation, and subsequently points out the impossibility of organic matter existing under the circumstances.

In order to develope the latent life in any germ, the surrounding temperature must not exceed 140° Fah., or fall below the freezing point of water. We are therefore led in the beginning to the fact that the development of life is comprised between very narrow limits of the scale of warmth and cold. Even on the earth, where the water, soil, and air are thickly peopled, there are regions where life disappears htrough a slight permanent lowering of temperature; and similarly the same result takes place by an increase of climatic heat. Life is equally limited by the isolation of the bodies which move in space. Every formation of an aggregate by the mutual attraction of smaller portions is accompanied by a development of heat which even the simplest organisms could not resist, and certainly life could not be transmitted from one globe to another by materials which even on entering our atmosphere pass suddenly from the cold state to intense incandescence. Consequently we are led to consider whether the life of organized beings is so simple that it may result from the spontaneous play of natural forces, and hence to the condtions under which such action may or may not occur.

The condition of temperature excludes immediately all bodies which shine by their own light, that is to say, every star that we see in the sky, except the planets. The nebulæ, formed as they are of incandescent hydrogen and nitrogen, are out of the question. Life therefore cannot be found except upon a cold globe associated with a hot body, which radiates to it the necessary additional heat. The suns serve precisely this purpose as regards their planets, and are marvellously organized to distribute a constant light and warmth during vast durations of time. But these sources must be of a nature to maintain life around them. Hence the variable stars must be excluded, *o* of the Whale for instance, which at times is of the second magnitude, and then gradually lessens in brilliancy and descends to the fourteenth magnitude, during 330 days. Similarly the stars that have already become cool, or are too small in mass ever to have had a very high temperature, must be left out of consideration, also the red, blue, and greenish blue stars, the light of which is deprived of the rays necessary for the development of organized beings, and lastly must be excluded the stars which exist in thousands in regions more or less contracted, where the temperature is necessarily above or below the circumscribed limits.

If now we pass to the examination of systems analogous to ours, other restrictions present themselves. In the first place, the condition of temperature excludes the planets of which the axes of rotation are too slightly inclined to the planes of their orbits, Uranus, for example, of which each hemisphere is exposed to the sun for a half revolution of forty-two years, and plunged in darkness during the balance of its course. Venus also, the axis of which is inclined 37°, is subject to great variation of temperature. We are also driven to exclude such bodies as have too slow a rotation, and hence are subject to too great influence of nocturnal radiation (the moon), and to eliminate others which, like Saturn, are surrounded with opaque rings, the shadows of which produce continual eclipses.

Proceeding still further, worlds devoid of a proper atmosphere must be omitted. An envelope formed exclusively of other permanent gases, even, will not suffice; it would be too permeable by heat, and its moderating action too limited. It is only by the presence of water in a liquid state, and by the enormous quantities of heat which, by its changes of state, it is capable of absorbing, that our atmosphere is enabled to fulfil its functions. Again the water must not cover the entire globe, but must be disposed in seas, so equilibrated that their movements reduce themselves to simple oscillations in fixed basins. This result could not be realized upon Saturn, since its mean density is lower than that of water.

As we stated at the outset, the chemical elements necessary to life are largely extended throughout the universe. While