

SCIENCE :

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Since we last referred to Mr. Edison and his incandescent lamp, the subject has been advanced another step and the final stage of complete and unqualified success achieved; permission has been granted to the Edison Light Company, to place surface conducting wires under the streets of New York City, and in the course of the next two or three months, one large district of that city will be enjoying the full benefits of Mr. Edison's system of electrical illumination.

Taking a retrospective review of public utterances on this question during the last eighteen months, we now extend our condolence to a certain class of professed scientific experts who have maintained, from first to last, the impracticability of Edison's well-devised plans.

Never in the annals of scientific discovery has a grosser attempt been made to pervert the truth, and mislead public opinion.

As one instance among many, let us take up what is offered as a standard work of reference on this subject: "The Electric Light, its Production and Use, embodying plain directions for the working of galvanic batteries, electric lamps, dynamo-electric machines, etc.," by J. W. Urquhart, C. E., edited by F. C. Webb, M. I. C. E., M. S. T. E., London, 1880. Under the heading of "Edison's Lamps" we find "much interest has been taken in the sensational and often absurd announcements, concerning apparatus in course of perfection by Mr. T. A. Edison, of Menlo Park, New York (?), and it was in *some quarters* thought, that when he had set himself about the task of inventing an efficient subdivision of the electric light circuit, *something* would in all probability be done."

"There is little probability, however, that this lamp (the horse-shoe carbon) will prove constant. Burnt paper in various forms has been repeatedly tried be-

fore, and it is assuredly not constant, in the best possible vacuum obtainable." "We may indeed rest assured, that upon further reflection, Mr. Edison will abandon this imperfect burner" The same authors in speaking of the "Sawyer lamp," describe it as "the best incandescent lamp of this kind that has been invented."

Such being the teachings of an educational work, written by professed teachers on this subject, let them be compared with the actual results achieved, and the relative positions of the two men at this moment. Seldom has the irony of events demonstrated more forcibly that the honest work of a man is proof against the assaults of fraudulent or ignorant critics, and that the leveling influence of time always reveals the truth.

On the various attempts to imitate Edison's lamp we shall offer but a few words, for most practical inventors are usually plagued by men who endeavor to duplicate their successful inventions. If "imitation is the sincerest of flattery" we suppose Mr. Maxim is merely desirous of paying Edison a high compliment. Concerning Mr. Swan, of Newcastle, England, who professes to have perfected a horse-shoe carbon lamp, apparently identical to that of Mr. Edison's, we would draw attention to the significant fact, that in Messrs. Urquhart and Webb's work on the "Electric Light," dated as recently as April, 1880, and published in Mr. Swan's own country, not a single reference is made to the Swan electric lamp—in fact, his name does not occur in the book. This would appear to be conclusive evidence that neither Mr. Swan, nor his lamp, were known in England up to that date—unless he is included among the nameless crowd, spoken of by the authors, who had "repeatedly used burnt paper in various forms," and *who failed to secure constant results, even "in the best possible vacuum obtainable."*

CONGRESO INTERNACIONAL DE AMERICAN-ISTAS.

We are in receipt of a pamphlet printed at Madrid, containing the official announcement of the above Congress, and instructions for those desirous of attending it. This is the fourth meeting of an International Congress for the discussion of American Archaeology, and will take place on the 25th, 26th, 27th, and 28th of September next.

The object to be attained by this body is to contribute to the progress of Ethnographical, Linguistic and Historical researches relative to the two Americas, especially for the period prior to Christopher Columbus, and to bring together such persons as are interested in such studies.

Among the delegates from the United States we notice the names of Professor Spencer F. Baird, of Washington; Professor R. B. Anderson, of the University of Wisconsin; Professor J. Putnam Duncan, of the Academy of National Sciences, Davenport, Iowa, and Albert S. Gatschet, Esq., of 304 E street, N. W. Washington, D. C., to whose courtesy we are indebted for a copy of these official instructions.

Those desirous of attending this Congress, or of forwarding papers, should put themselves in communication with one of the above named gentlemen. Residents of New York City are welcome to read the prospectus at the office of "Science."

The Spanish railway authorities have consented to reduce the fares of those attending this Congress, and other concessions have been arranged. We direct the attention of those who have read early notices of this Congress to the fact that the first day of meeting has been changed from the 18th to the 22nd of September. This change has been made for the convenience of those who would attend two other International Congresses which meet at about the same time, one at Berlin and another at Venice.

THE UNITY OF NATURE.

BY THE DUKE OF ARGYLL.

VII.

ON THE MORAL CHARACTER OF MAN CONSIDERED IN THE LIGHT OF THE UNITY OF NATURE.

(Continued).

It breaks down the presumption that whatever is most savage is therefore probably the most ancient. And then, when we come to think of it, this idea, from being vague and general, rises into suggestions which are definite and specific. On the great fundamental subject of the relation of the sexes, conclusions not less important than those respecting cannibalism and infanticide are forced upon our conviction. We have seen that the cruel treatment of the female sex is almost universal among savages, and that it is entirely unknown among the lower animals. It is in the highest degree improbable and unnatural to suppose that this habit can have been primeval. But the same considerations carry us a great deal farther. They raise a presumption in favor of the latter origin of other habits and customs which are not confined to the savage state, but have prevailed, and do now prevail, among nations comparatively civilized. There can have been no polygamy when as yet there was only a single pair, or when there were several single pairs widely separated from each other. The presumption, if not the certainty, therefore is, that primeval Man must have been monogamous. It is a presumption supported by the general equality of the sexes in respect to the numbers born, with only just such an excess of the male sex as tends to maintain that equality against the greater risks to life arising out of manly pursuits and duties. Thus the facts of Nature point to polygamy as in all probability a departure from the habits of primeval times. Like considerations set aside, as in a still higher degree unnatural and improbable, the primeval rank of other customs of which the historians of human culture tell us, and probably tell us truly, that there are many surviving traces among the existing customs of men. Thus "marriage by capture" cannot have been primeval. It may be very ancient; but it cannot possibly have arisen until the family of Man had so multiplied and scattered, that it had become divided into tribes accustomed to act with violence towards each other. And then as regards a custom still more barbarous and savage, namely, that of polyandry, and that which is now euphemistically called "communal marriage," apart from the strong presumption in favor of primeval monogamy, they are stamped by many separate considerations as corruptions and as departures from primeval habits. In the first place, all such customs are fatally injurious to the propagation of the race. In the second place, they are unknown in the animal world. In the third place, their origin can be assigned, in many cases, if not with certainty at least with the highest probability, to one cause, and that is the previously-acquired habit of female infanticide. But as regards this last habit, besides the cer-

tainty that it cannot have been primeval, we know that it has often arisen from customs such as the exorbitant cost of marriage portions, which can only have grown up under long developed and highly artificial conditions of society.

But powerful as all these separate considerations are to raise at least adverse presumptions against the primeval rank of the worst and commonest characteristics of savage life, the force of these considerations is much increased when we find that they are closely connected together, and that they all lead up to the recognition of a principle and a law. That principle is no other than the principle of Development; that law is no other than the law of Evolution. It is a curious misunderstanding of what that law really is, to suppose that it leads only in one direction. It leads in every direction in which there is at work any one of the "potential energies" of Nature. Development is the growth of germs, and according to the nature of the germ so is the nature of the growth. The flowers and fruits which minister to the use of Man have each their own seed, and so have the briars and thorns which choke them. Evil has its germs as well as good, and the evolution of them is accompanied by effects to which it is impossible to assign a limit. Movement is the condition of all being, in moral as well as in material things. Just as one thing leads to another in knowledge and in virtue, so does one thing lead to another in ignorance and vice. Those gradual processes of change which arise out of action and reaction between the external condition and the internal nature of Man have an energy in them of infinite complexity and power. We stand here on the firm ground of observation and experience. In the shortest space of time, far within the limits even of a single life, we are accustomed to see such processes effectual both to elevate and degrade. The weak become weaker and the bad become worse. "To him that hath more is given, and from him that hath not is taken even that which he seemeth to have." And this law, in the region of character and of morals, is but the counterpart of the law which prevails in the physical regions of Nature, where also Development has its double aspect. It cannot bring one organism to the top without sinking another organism to the bottom. That vast variety of natural causes which have been grouped and almost personified under the phrase "Natural Selection," are causes which necessarily include both favorable and unfavorable conditions. Natural Rejection, therefore, is the inseparable correlative of Natural Selection. In the battle of life the triumph of one individual, or of one species, is the result of causes which bring about the failure of another. But there is this great distinction between the lower animals and man,—that in their case failure involves death and complete extinction, whilst in his case it is compatible with prolonged survival. So far as mere existence is concerned, the almost infinite plasticity and adaptability of his nature enable him to accommodate himself to the hardest lot, and to the most unfavorable conditions. Man is the only animal whose possible distribution is not limited to narrow, or comparatively narrow, areas, in consequence of exclusive dependence upon particular conditions of climate and of productions. Some such conditions of a highly favorable kind may, and indeed must, have governed the selection of his birth-place and of his infancy. But when once born and fairly launched upon his course, it was in his nature to be able to prevail over all or over most of the limitations which are imposed upon the lower animals. But it is this very power of adaptation to unfavorable circumstances which involves of necessity the possibility of his development taking an equally unfavorable direction. If he can rise to any level, so also can he descend to any depth. It is not merely that faculties, for the exercise of which there is no call and no opportunity, remain dormant, but it is also, that if such faculties have already been exercised,