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DISCOVERY OF A FRESH-WATER LAKE NEAR THE SEA OF ARAL.

ACCORDING to information conveyed to the Geographical Society of Paris by M. Edouard Blanc, and printed in the May number of the Proceedings of the Royal Geographical Society of London, an interesting discovery of a fresh-water lake to the south-west of the Sea of Aral has been made by Col. Koslowski, of the Russian geographical service of Turkestan. Up to a comparatively recent date the Sea of Aral was represented on the maps as forming at its south-west corner a deep, narrow gulf (named Aïbu-ghir), extending far into the land, and bordering on the south-east the great Ust-Urt plateau. The Russian military expedition to Khiva (1872-3), in its march round the south-west and south of the Sea of Aral, found no such arm of the sea, and since then the Gulf of Aïbu-ghir has practically disappeared from the maps. In the map which accompanies Baron Kaulbars' work on the delta of the Amu-daria, the so-called Gulf of Aïbu-ghir is shown merely as a depression, without water, and its form and position are only vaguely indicated. Recent surveys effected by Col. Koslowski have revealed the existence of a fresh-water lake, occupying very nearly the position formerly assigned to the Gulf of Aïbu-ghir, but differing in its form. This lake is quite distinct from Lake Sari Kamish, which lies to the south of the table-land of the Ust-Urt, and has recently been the subject of a special exploration by Gen. Glukhovskoi. Unlike the Sari-Kamish depression, which, except at times of great overflows of the Oxus, is mostly dry, Lake Aïbu-ghir has a permanent supply of water, being fed by a fresh-water stream flowing into it from the north-east, which, although not in direct communication with any branch of the Amu-daria, drains the marshes formed by the overflowing of that river. The probable explanation of the formation of this lake is, according to M. Blanc, that it is part of the former great Aralian basin, which has become isolated in consequence of the general and progressive desiccation which has taken place in all this region. The elimination of the salt from its waters might be due to the formation of salines, although no salt-beds under the sand round the shores of the lake have yet been discovered; or it might be supposed that at some recent epoch, during a great overflow of the Oxus, the lake basin was filled with fresh water, the salt water being driven back into the Sea of Aral, and that at the same time a bar was formed by the alluvium brought down by the river, which would prevent the salt water flowing back again into the lake. The map of Col. Koslowski also fixes definitively the contour of the south-eastern escarpment of the Ust-Urt plateau and the topography of the country to the south-west of the Sea of Aral.

IMMORTALITY IN THE LIGHT OF MODERN DYNAMICS.[1]

THE hypothesis in reference to the re-grouping of atoms, in accordance with the calculus of permutations, which I announced in conclusion of my lecture on "Geological and Cosmical Problems," before the Franklin Institute, on November 17, 1890, is not entirely new, and I am bound to say that in at least one of its aspects it was advanced more than a hundred years ago by the great German philosopher Leibnitz, at a time when the sciences of chemistry and physics were not sufficiently advanced to warrant such a speculation. In the light of modern dynamics, however, it deserves our closest attention, for if it can be shown that matter is composed of ultimate particles, call them atoms, centres of force, or what we like, which are indestructible and in a state of continual vibration, I do not see how we can escape the conclusions which are forced upon us by this hypothesis. Some of the points which I am now about to discuss are new, and I am not aware that this entire subject has ever been presented in the manner in which I now propose to deal with it.

According to the nebular hypothesis our earth, like all the rest of the planets, once existed in the shape of a gas-ring, which was thrown off or became detached from the sun during its process of condensation. This ring could not retain its form: it necessarily went to pieces, and these afterwards collected into a single gas-globe, or spherical mass, which kept on pursuing its course around the great central body. The gaseous globe radiated an enormous amount of heat, it grew denser and denser, while its diameter diminished; it underwent an endless series of metaphorphoses, until it finally became the earth as we know it, the planet which has given us birth. So far all this is nothing new.

Now, even if the nebular hypothesis should prove erroneous, the conclusions which I am now about to present will remain in force, for the same ultimate conclusions can be drawn from every other world-hypothesis which has, as yet, been advanced.

Every particle of our earth, every object, every substance which we now have upon or in our earth, must have already existed in that gaseous ring or primitive gas-globe: no matter in what form or condition, it was there. In that gas-globe were the particles which, after countless ages, became united and roamed the great Mississippi valley in the shape of a mastodon; in that globe of gas were the atoms of carbon which now constitute the table on which I am writing these lines; in that immense rotating sphere were the substances which are now united in the body of my humble self.

Could we but follow, in a few days or hours, the changes, the transformations, the endless pilgrimages, which the atoms and molecules of the substances had to undergo during those æons before they became united so as to form, for instance, a human body, what marvels would we behold? The particles of hydrogen, carbon, phosphorus, etc., of which my body is composed, what a history might they not tell? In how many other bodies of the human species, of animals, plants, and inorganic compounds may they not already have existed, separated, united, differently grouped or arranged? What may they not already have gone through and experienced?

If King Solomon, wise king though he was, really pronounced, or was the first to pronounce, the opinion that there is nothing new under the sun, he could not possibly have been aware of the enormous significance which attaches to this idea in the light of modern science. Why should not the dust of Cæsar which is now filling a bung-hole, why should not those atoms and molecules which two thousand years ago were united in the body of Cæsar,—why should they not, after endless transformations, endless changes, endless transitions, become again united in precisely the same manner; in other words, why should not the same Cæsar of whom we read in ancient history, reappear at a given time: in short, why should not every thing now existing be compelled to undergo the same cycle of changes, and reappear, not once, but an infinite number of times? It would be very strange if such were not the case. The following will illustrate this.

Supposing we were to take six dice, such as are used in the

[1] Addendum to a paper on "The Limits of Scientific Inquiry" read before the Franklin Institute, Philadelphia, Nov. 17, 1890, by Dr. H. Hansoldt of Columbia College.