ART. XLII.—*Search for Solar X-Rays on Pike's Peak*; by
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EXPERIMENTS carried on by M. C. Lea* and others have failed to show the presence of Röntgen rays in solar radiation. If these rays reach us from the sun, their intensity must be exceedingly feeble. The suggestion has been made that Röntgen rays may exist in sun-light, but are absorbed by the earth's atmosphere. The fact that Lenard rays are stopped by only a thin layer of air made it not improbable that Röntgen rays might be stopped by a thick layer of it. On this hypothesis a mountain top is the best locality to examine sun-light for the new rays. The writer determined, moreover, to expose the photographic plate to solar rays, not several hours, but several weeks.

During preliminary experiments made in Colorado Springs, it was found that a sheet of aluminium would allow certain solar rays to pass through. These were not Röntgen rays, for the reason that black paper placed between the aluminium and the photographic plate seemed to cast as deep a shadow as did a strip of iron. A different mode of exposing the plate was necessary and a plan similar to Lea's was finally adopted.

The first 100 leaves of an unbound book were turned over, and a rectangular trough of the dimensions of the photographic plate (7.5 by 13^{cm}) cut into the next 55 pages. Seven pages above this trough, thin metallic plates, from 5 to 20^{mm} wide, were placed between two leaves and held in position by gumming the two leaves together. Care was taken to let the mucilage dry before shutting the book. After the photographic plate (Seed, 23) was placed in the trough, the book was closed, wrapped in black tissue paper, then in paraffine paper, and finally put into a tin box.

The box was prepared as follows: Its lid was placed externally over its bottom and a rectangular window, 7.5 by 13.5^{cm}, cut through them both. Thereupon a sheet of aluminium, 13 by 23^{cm}, and .29^{mm} thick, was placed between the lid and the bottom, so as to screen the window. The wide margin of the aluminium, lying between the sheets of tin, was united to them above and below by thin layers of bees'-wax. Externally the edges of the rectangular window were covered with sealing-wax, to which a thick layer of paint was finally applied. A new lid was provided for the open side of the box and both lids were soldered on. Prepared in this manner, the box could be left exposed to all kinds of weather without danger that moisture would reach the photographic plate. To touch the

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plate, rays had to penetrate the sheet of aluminium, a few layers of paraffine and black paper, and 100 pages of the book. Röntgen rays of intensity ordinarily met with in the laboratory penetrate at once very much greater thicknesses of these materials.

Through the kindness of Mr. F. Blackmer and Mr. D. Rupp, of Colorado Springs, the box was taken to the summit of Pike's Peak (elevation 14,147 ft.) and fastened by wires upon a roof sloping southward. The box was left in that position from June 27 to August 10. When subjected to the usual process of development, the plate failed to show any action of rays and presented a uniform surface, without traces of shadows from the metallic strips. Another plate, similarly exposed from July 7 to August 28 in Rosamont Park, near Pike's Peak, at an altitude of 9200 ft., gave the same result.

Thus even in high altitudes no evidence of the presence of Röntgen rays in solar radiation was obtained.

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