ART. VII.—*X-Rays and Mineral Phosphorescence*; by
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IN January, 1897, while experimenting at Bowdoin College on fluorescent screens for the X-rays, the attention of the writer was attracted by the fluorescence of minerals under the action of these rays.

Doubtless others have experimented on this subject, but the writer has been unable to find more than a brief note stating the mere fact of fluorescence under action of X-rays. Some of the following results, therefore, may be of interest. Fluorite when exposed to X-rays phosphoresces with a bluish white light which continues for a very long time after being removed from the influence of X-rays. It has been placed by some experimenters under the photographic plate in radiography, to increase the effect of the X-rays; but unfortunately it fogs the plate and blurs the outline of the image.

Very many minerals were tried and more than two-thirds were found to be phosphorescent to a greater or less degree. The group of minerals containing Ca were most susceptible to the X-rays. Of 16 specimens tried 12 were phosphorescent, with light varying from pure white to yellowish red. The feldspar group is also susceptible, also others of the silicates; but in general minerals containing ores of the metals are non-phosphorescent.

Of all substances tried fluorite and calcite seemed the most suitable for experimentation, and all the experiments were performed with these minerals, outside the X-ray tube, in a perfectly dark room. It is well known that both light and heat radiations can produce luminous effects in the case of mineral crystals, and these effects are very much like those produced by X-rays; at least far as the eyes can judge; but if we heat the crystals and then expose them to the radiations coming from an X-ray tube, the character of the light is often changed. For example:

Glass, which fluoresces bluish, if sufficiently heated loses its power while hot; but as it cools the light can be seen slowly creeping back over it; when cool it regains its former condition.

With fluorite the effect is similar except that the light, instead of disappearing, is weakened and fades out sooner than that from the unheated, when removed from the influence of the X-rays. If fluorite is heated very hot the phosphorescent light is very much weakened.

With calcite, which phosphoresces a pale reddish yellow, the effect of heat is to brighten very much the light emitted, and

to change its color to white. The effect of heat is very striking with calcite which has been heated to redness and allowed to cool so that it is just invisible; then when exposed side by side with the unheated it is nearly twice as bright as the latter. On cooling it regains its former color and intensity of radiation.

The effect of heat on other crystals in some cases causes increased emission of light, in others diminished effect, and in several cases no effect was observed.

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