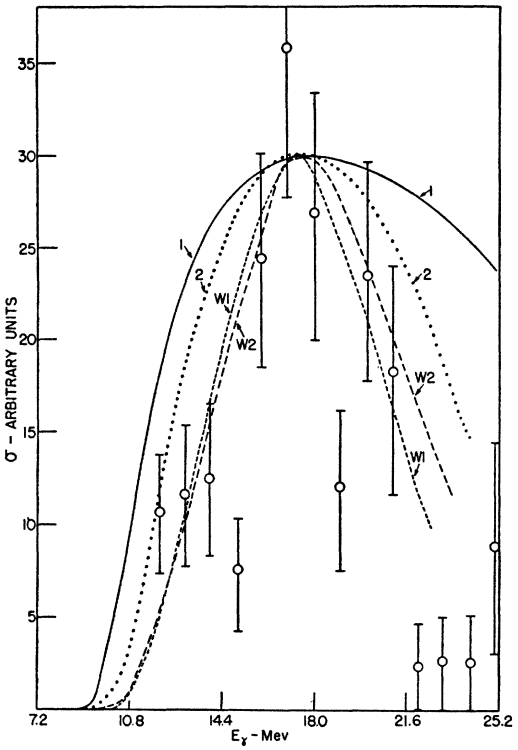

FIG. 1. $\sigma(E_\gamma)$ for various ϕ). 1. $\exp(-r/b)$, $b=0.8\times10^{-13}$ cm. 2. $\exp(-r^2/b^2)$, $b=2.45\times10^{-13}$. W1. $b/a=\frac{1}{2}$, $b=3.53\times10^{-13}$, $r_0=3.7\times10^{-13}$. W2. $b/a=2$, $b=5.19\times10^{-13}$, $r_0=4.7\times10^{-13}$.

Millar and Cameron are shown; the errors indicated are merely the statistical errors. The data represent 109 events. It will be observed that the tetrahedral function produces a narrow peak (which the data seem to indicate) and maximizes σ for a correct energy with a reasonable nuclear radius. However, the Gaussian wave function is much easier to use and gives only a slightly too wide peak.

Wäffler and Younis[3] give $\sigma(17.5\text{ Mev})=(1.8\pm0.6)\times10^{-4}$ barn. For the curve W1, the absolute value is $\sigma(17.6)=3\times10^{-3}$ barn. This is to be multiplied by

$$\left|\int\Psi_f^*\Psi_0\right|^2<1$$

and hence is an upper limit and an order of magnitude estimate only.

A more complete description of this work will be submitted to the *Canadian Journal of Research*. I am indebted to Dr. J. D. Jackson for discussions of this problem.

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Photoelectric Changes Induced in SrO and BaO by Ultraviolet Irradiation

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IN studies of the photoelectric emission from SrO and BaO films, we have observed changes induced by irradiation with ultraviolet lying in the fundamental absorption band of the crystals. Figure 1 shows, as a function of time, the photoelectric

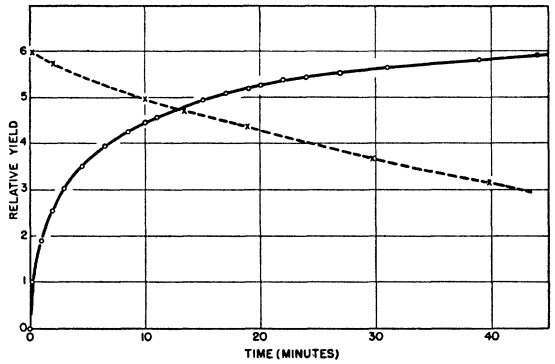

FIG. 1. The solid curve shows the increase of yield with time as a sample of SrO was irradiated continuously with $\sim2\times10^{12}$ quanta/sec./cm^2 at $h\nu=5.80$ ev. The broken curve shows the decay of this yield (at room temperature) when radiation was incident only during the short intervals necessary for measurement.

yield at $h\nu=5.80$ ev from a layer of SrO produced by oxidizing Sr metal. The photon energy involved here slightly exceeds that at the fundamental absorption edge of SrO as measured by Sproull.[1] Since the electron affinity of SrO is probably of the order of 1 ev, photoelectric ejection of electrons from the occupied energy band of the crystal is not possible at this $h\nu$-value. In agreement with this statement, the photoelectric yield was initially very small. It rose rapidly, however, as shown in Fig. 1, the initial increase being linear in time. After some minutes, the curves saturated. If the irradiation was stopped, the photoelectric yield measured in subsequent intervals decreased with time. Similar results[2] were obtained with BaO by irradiating with $h\nu>3.8$ ev. The initial yield in this case was usually measurable, however, and was probably due to excess Ba or other impurities.

These phenomena are very much like those observed when F-centers are formed in an alkali halide by irradiation in its fundamental absorption band.[3] The results given here suggest that excitions (or free electrons and holes) produced by the absorption of photons may be forming centers in SrO and BaO. It is possible, of course, that these centers may be associated with impurities. Whatever the interpretation, the effects must be recognized in photoelectric work on these crystals.

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