and reports whether he saw it or not. This is done for six intensities which are presented in a deliberately random sequence, each for 50 times. A series takes about one and one half hours.

The data for us three are given in Fig. 2. Com-

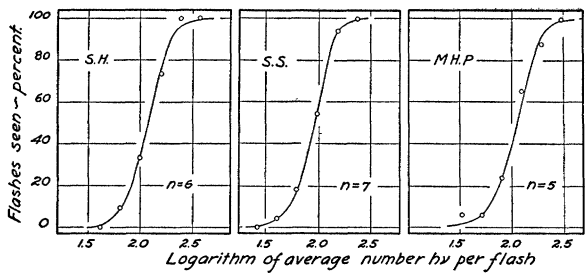

FIG. 2. Relation between the average number of quanta delivered by a flash of light at the cornea and the frequency with which the observer sees the flash. The curves are the computed Poisson distributions taken from Fig. 1. Each point represents 50 observations.

parison with the curves in Fig. 1 shows that the measurements are fitted best by Poisson distributions in which n is 5, 6 and 7 quanta per flash. Smaller and larger values of n are definitely excluded. Thus the number of critical physical events necessary in the retina in order to produce a visual effect lies between 5 and 7. This is in excellent agreement with the results determined by the straightforward physical measurements. We must therefore consider them as the actual number of quanta absorbed by the retina for the initiation of a visual act.

In applying the Poisson probability distribution, we have assumed that a constant number of quanta is necessary in order to see a flash of light. In view of the supposed variability of an organism from moment to moment, we have considered the consequences of assuming this number n to vary. An example will make this clear. Suppose that the biological variation lies between 5 and 9 quanta per visual act, and that it has an ordinary probability distribution. The curves in Fig. 1, weighted in such a way and averaged, yield a curve which is identical with the ones in Fig. 1 for $n=5$ or 6. Thus when biological variation is imposed upon the physical variation there occurs no change in the essential characteristics of the physical distribution and only a small decrease in the value of n. When, as in Fig. 2, the measurements yield n values of 5, 6 or 7, these represent lower limiting values for the physical number of quanta.

In considering the nature of fluctuations in response given by an organism, it has always been assumed that the stimulus is constant and that the organism is variable. The present evaluation of our measurements shows however that at the threshold, where only a few quanta of energy are involved, it is the stimulus which is variable, and that the nature of its variability determines the variation encountered between response and stimulus.

SCIENTIFIC EVENTS

THE COLLEGE OF SURGEONS, LONDON

THE following account of the damage by air raids to the Royal College of Surgeons, London, is given in the London *Times* for May 21:

Irreparable losses, including most of the Hunterian Collection, were suffered by the Royal College of Surgeons in Lincoln's Inn Fields, whence the society moved from their eighteenth-century hall in the Old Bailey. Incendiary bombs first fell on the roof of the building, but just as a watcher was giving the alarm a high-explosive missile struck No. 5 room of the museum. Only two persons on the premises were slightly injured. In spite of great damage to the interior the fabric of the college is more or less intact, but the museum buildings have suffered severely, and fire also gutted an adjoining building containing solicitors' offices and the College of Estate Management.

The most valuable specimens in Dr. John Hunter's collection, purchased by the Government for £15,000 two years after his death in 1793 and presented to the college, are probably safe under the débris, having previously been moved into reinforced sections of the sub-basement. The collection of portraits and pictures, including Reynolds's portrait of Hunter, are safe in the country, and the part of the records still at the college had been stored in strong rooms that withstood the blast and flames.

But thousands of museum pieces are gone, among them the skeletons of kangaroos brought by Captain Cook from Australia, and the comparative osteology collection of 4,000 specimens acknowledged to be the finest in the world. Much of the material antedated British Museum specimens, and, as Professor Cave, the assistant conservator, said yesterday, the greater part of the wonderful work of Sir Richard Owen and Dr. William Flower has been undone.

All Dr. Hunter's eighteenth-century furniture, which was in the president's room, was destroyed. The original surgical instruments used by Lister were recovered, but many others were lost. Though the oldest mummy in the world, that of Ra Nefer, an Egyptian nobleman who died, it is said, about 2900 B.C., was destroyed, many mummies of popular interest have been salved.

By a grim coincidence the invaluable Army Medical War Collection, containing plaster casts of every type of wound, was also destroyed, as were the council room and lecture theater.