

appear to be admirably equipped for research in physics, physical chemistry and biochemistry. Miss G. E. Woodward is still carrying on with her researches on the metabolism and structure of amino acids. In this new institute it is expected that close co-operation between chemists, physicists and biologists will lead to new advances.

#### Rapid Black-out of a Factory

A DESCRIPTION is given in the *Electrical Review* of July 11 of a method of almost completely blacking-out in a few seconds a factory by simply pressing a button. A camouflage installation recently completed at a large factory provides for blacking out 550,000 sq. ft. of roof lights in 15 sec. Originally hard wall-boards were fitted to the outside of all the north lights and other windows. Alternate panels have been removed from the north light windows and fixed into a frame in their respective positions over the windows, the frame being made to move laterally across the whole span of lights through grooves cut in the sections fixed to the glazing bars. Steel cables were fixed to each end of the frame, passed over spring-tensioned pulleys and secured to a winch mounted on the wall inside the factory. The winch is operated by a  $\frac{1}{4}$  h.p. D.C. compound-wound G.E.C. Witton motor. The forward and reverse movements of the shutters are obtained by reversing the direction of the motor, which is controlled by forward and reverse contactors operated by two limit switches. The latter are tripped by 'fingers' mounted on steel rods secured by the cables, which travel up and down through a distance equivalent to the movement of the steel frame. Each span of lights of approximately 1,000 sq. ft. is operated by one  $\frac{1}{4}$  h.p. motor, and more than 500 motors have been installed. In the event of damage to the electrical equipment, the motors can be disconnected and the winches operated by hand in each individual bay.

#### New Tone for Dial Telephone Systems

IN long-distance telephony when messages or signals have to be transmitted simultaneously over wire networks, an error in dialling may result in reaching a group of numbers not assigned for service. In such cases a special tone may be used to inform the customer of his error, and this special development in switching is widely used in the Bell System networks of the United States. In the *Bell Laboratories Record* of April, Mr. M. E. Krom communicates a paper giving the development of the 'no such number' tone. The new tone varies continuously in frequency, like that of a siren, alternately rising and falling at half-second intervals. The sound is quite different from any other tone used in the Bell system. At the lowest pitch the fundamental frequency is 200 cycles per second, and at the highest pitch, 400 cycles. Harmonics up to 6,000 cycles are in both tones, and these give the latter a richness not found in single-frequency waves. The tone is generated by a 'relaxation' oscillator consisting of a vacuum tube, condenser and resistance. The tone is amplified by another vacuum tube which raises the level above

that of the dial and busy tones. To lengthen the life of the vacuum tubes, the plate circuits are closed only when the tone is required; the filaments are continuously heated, however, to maintain the circuit in readiness for instant service. During field trials it has reduced circuit-holding time on numbers wrongly dialled and resulted in a higher percentage of correct numbers on the second dialling.

#### Egyptian Astronomy

HERBERT CHATLEY has given in a paper on "Egyptian Astronomy" (*J. Egypt Archaeol.*, 26, 120; 1940) certain conclusions regarding the various figures found in the Egyptian "celestial diagram", of which nearly twenty copies from the Eleventh Dynasty down to Roman times are in existence. The general deductions that have been made about the figures are included under eight categories, but limits of space do not permit any detailed description; those who are interested in Egyptian archaeology will find it profitable to study the paper carefully. It is difficult to discover from reading the account of the constellations, Dekanal Band (the dekans were 10-day stars from the helical risings of which the ten-day week of the Egyptian year was marked), Meta-Dekans, etc., how much astronomical knowledge the Egyptians really possessed. Popular belief credits ancient Egypt with extensive knowledge, but archaeological research scarcely supports this view in the realm of astronomy. The records show very little regarding the actual observations of their inventors, and many of them are of a magical or religious nature the object of which was to protect or assist the dead. The author has previously expressed the opinion that the dekanal lists were revised about the beginning of the New Kingdom, about 1600 B.C., and he conjectures that the celestial diagram was invented then as a talisman which concentrated the power of the heavenly bodies into one form.

#### Mathematical Problems in Seismology

A. BLAKE has recently directed attention to many outstanding problems in mathematical seismology (*Trans. Amer. Geophys. Union*, 1940). The following problems are, more particularly, mentioned: (1) Problems in the theory of seismic waves due to inhomogeneities in the media and other causes, and to new methods available for the study of the interior of the earth. (2) Problems of instrumental seismology including the new strain meter and rotation seismograph. (3) Problems relating to the complexities encountered in determining the response of engineering structures to the motion of a strong near earthquake. (4) Problems of statistical seismology, especially the periodicity problem. In many cases Blake states that seismological calculations may be performed by machines such as the differential analyser and punched card machines.

Concerning strong-motion problems, Blake says that the analysis of the response of a structure into characteristic or normal components satisfying linear equations depends on the treatment of the strain-