ABSTRACTS

The Editorial Office will welcome contributions of abstracts and book reviews from members and subscribers. Contributors to this section are urged to give correct and complete details regarding the reference. Items which should be included in abstracts are:

Title of article
Name of author as it appears on the article
Name of periodical and volume number
Date and number of issue
Page on which the reference is to be found

In book reviews, the following data should be given:

Title of book
Name of author as it appears on the title page
Name of publishing company
Date of publication
Edition
Number of pages and number of illustrations

The customary practice of initialing abstracts and reviews will be followed. Contributors to this issue are as follows: G. L. Chanier, Paul E. Sabine, and the Monthly Abstract Bulletin of the Kodak Research Laboratories.

A Method for Estimating Audible Frequencies. W. A. MARRISON. *Projection Eng.*, March, 1930, p. 14. The author indicates a method which permits one to estimate by ear frequencies in the range from approximately 50 to 4000 cycles. If one is not able to recognize a certain pitch without auxiliary means, one should first adopt an approximate standard. The lowest notes one can sing or whistle may be used as such a standard and can usually be relied upon to within 10 per cent. The next step is to learn to recognize musical intervals. The frequency ratios corresponding to the musical intervals are given and the author explains how to use them to find the frequency of any tone in comparison with another of which the frequency is known. A table of equally tempered scale based on $A_3 = 435$ is given, as well as the Lissajous figures corresponding to frequency ratios for five different phase angles. The musical intervals are indicated beside the corresponding Lissajous figures. G. L. C.

Sound Theater as an Acoustic Laboratory. J. S. PARKINSON. *Ex. Herald World*, **97**, Section 2, Dec. 21, 1929, p. 38. This is an analysis of acoustical problems in the motion picture theater. Reproduced sound of the human voice presents a different problem from directly spoken sound. A horn is directional, whereas the average speaker's voice is only slightly so. External sound waves are also collected to produce so-called "feed-back" effects with horns. Reverberation in the general sense is defined as the length of time a sound requires to decay to inaudibility. In the author's opinion, there is a universal tendency in theaters

to keep the sound level too high with a resulting over-lap in the sound successions which is unpleasant. In other words, there is an upper limit of reverberation time. A balance must be found between loudness and reverberation for each theater. A summary is presented of Knudson's work on the quality of articulation in auditoriums and his method of testing is described. The ideal decay curve of sound heard in an auditorium should be comparatively smooth, whereas most rooms have some flat walls and pockets which cause sharp breaks in this curve. More attention should be paid in the future to naturalness and quality of sound rather than to intelligibility alone.—*Kodak Abstr. Bull.*

Glance at Cinema Inventions. *Bioscope* (*Mod. Cinema Technique*), **81,** Dec. 18, 1929, p. 1. Of patents issued in 1928 and 1929, 52 are concerned with color, 57 with synchronism, 21 with stereoscopy, 8 with continuous motion, 10 with mechanisms to avoid fire, 9 with filming apparatus, 5 are mechanisms for preparing films, 30 are for perfecting projection, and 23 are sundry inventions in the technical and photographic field. There is a notable increase in stereoscopic patents as compared with a similar review in 1918 to 1919. Continuous motion and anti-fire devices are about the same in number, while there is a striking decrease in inventions for perfecting material for film manufacture, filming, projection and similar devices.—*Kodak Abstr. Bull.*

Vibration Plus Amplification in Acoustical Treatment. D. FOX. *Ex. Herald World,* **97,** Section 2, Dec. 21, 1929, p. 31. Sound motion pictures have greatly stimulated research on acoustical problems. Q. Q. Sabine of Harvard was the first to make a series of actual measurements of several theaters and halls. According to a recent estimate made on the acoustic properties of the motion picture theaters of the United States, 80 per cent have faulty acoustics. E. Berliner, in studying these problems, applied the basic principles of vibrating diaphragms. He found that agitation of an air body enclosed in hard walls caused vibrations which resounded as reverberations. When this air body, called a tympanum, was enclosed by vibratory walls, the sound was amplified and the reverberation eliminated. The tympanums consist of flat disks of wire netting covered on one side with heavy paper, and on the opposite side with an acoustic plaster composed of cement mixed with pumice, sawdust, asbestos, and several other materials. These disks are nailed over the wall leaving a half-inch space between the wall and the netting. Several public buildings have been finished with this type of acoustic lining with improved acoustic results.—*Kodak Abstr. Bull.*

Reverberation Time in "Dead" Rooms. CARL F. EYRING. *J. Acoustical Soc. Amer.*, **I,** No. 2, Pt. 1, January, 1930, p. 217. The well known Sabine formula $T = 0.05\ V/a$ for the time of reverberation was experimentally determined by experiments in rooms in which the total absorbing powers were relatively low and the reverberation times correspondingly high. Theoretically, it is based upon the assumption of a homogeneous distribution of intensity, interference effects being neglected, and a random direction of propagation. This in effect amounts to assuming that the absorption at the bounding surfaces of the room is a continuous process. That these assumptions are valid in the case of "live" rooms, that is, rooms in which a large number of reflections are necessary to reduce the intensity of the reverberant sound to $^1/_{1,000,000}$ of its initial intensity, is shown by the agreement between theory and experiments. Measurement of the reverberation

time in a "dead" room, that is, one in which the average coefficient of absorption was of the order of 0.5, gave values lower than those computed by the formula. For such a case the author maintains that the assumptions of homogeneous distribution and random direction do not hold and that the absorption is not a continuous process but is more properly considered as taking place in a finite number of discrete steps, with an intervening time interval of $\Delta t = p/v$, where v is the velocity of sound and p is the mean free path of a sound element between reflections. From these assumptions he derives the equation

$$T = \frac{0.05V}{-S \log_e (1 - \alpha_a)}$$

where S is the total area of the room and α_a is the average absorption coefficient.

This equation gives results which agree more closely with the experimental results in "dead" rooms. In more reverberant rooms the two formulas give practically the same values. The author points out the importance of the new point of view in the talking picture industry where conditions of high absorption are frequently desired in sound stages. P. E. S.

High Speed Camera. *Science ind. phot.*, No. 4, April, 1930, p. 160. The Institute for Physical Research of the University of Tokyo has shown, during the recent Scientific Congress in Tokyo, a camera taking 40,000 pictures a second, by means of a drum having 180 mirrors revolving at a speed of 225 revolutions a second. G. L. C.

Film Container Reel. R. C. HOLSLAG. *Movie Makers*, **5**, February, 1930, p. 123. A combined reel and humidifying can is described which consists of a flange that clips over the circumference of an unperforated reel. A new projector stand is also described which holds the projector, film splicer, spare reels, rewind, and translucent screen.—*Kodak Abstr. Bull.*

Special Carbon Arc for Wide Films. *Mot. Pict. News*, **41**, Feb. 1, 1930, p. 69. A special carbon arc, claimed to have from 30 to 50 per cent greater brilliancy than the sun affords, is now being marketed.—*Kodak Abstr. Bull.*

Novel Projector Shutter. *Bioscope* (*Mod. Cinema Technique*), **81**, Dec. 18, 1929, p. v. The new Berger projector shutter, recently marketed by the Globe Reliance Corporation of America, is said to pass 50 per cent more light than any previous design. The shutter consists of three rotating members, each with three blades. The shutters are so stepped that the blades pass behind each other, and the actual gate shutter is formed in the central portion, so that at any one moment the shutter consists of one edge of a blade from each of the rotating members. —*Kodak Abstr. Bull.*

Philips Incandescent Projector Lamp. T. J. J. A. MANDERS. *Cinemat. franç.*, **12**, Dec. 21, 1929, p. 103. *Bioscope* (*Mod. Cinema Technique*), **82**, Feb. 12, 1930, p. iii. *Kinotechnik*, **11**, Sept. 5, 1929, p. 468. The Philips projection lamp avoids loss of light by absorption caused by blackening of the lamp walls. The upper part of the bulb is spherical, the lower part narrowing to a cylinder, near the bottom of which is the filament. The leads enter at the top. Convection currents within the bulb carry the tungsten vapor from the filament to the upper part of the bulb, where it deposits. The loss in efficiency throughout the life of the lamp is very small.—*Kodak Abstr. Bull.*

Running the Talkies. XVII. R. H. CRICKS. *Kinemat. Weekly*, **154**, Dec. 5, 1929, p. 63. A new film and disk sound reproducing system has been invented by A. W. Harris and marketed by the British Phototone Company. Special features are discussed, such as the novel form of the synchronizer. Instead of the usual sound gate, there is a drum around which the film passes on its way from the bottom sprocket to the spool box. The drum being mounted separately from the projector, the effect of vibration of the latter is eliminated. A radiovisor bridge selenium cell is used in place of the usual photo-electric cell.—*Kodak Abstr. Bull.*

Corophone. New Talkie Apparatus. *Kinemat. Weekly*, **154**, Dec. 12, 1929, p. 61. Brief notes on the Corophone reproduction equipment for sound-on-film or disk are given. The sound-on-film leads can be fitted to practically all projectors. For the illumination of the light-sensitive cell, a dual light source is provided which is run from a battery. No other batteries are employed.—*Kodak Abstr. Bull.*

Running the Talkies. XVIII. British Acoustic. R. H. CRICKS. *Kinemat. Weekly*, **154**, Dec. 12, 1929, p. 61. The new form of the British Acoustic reproduction equipment is described and criticized. The optical system is unique in that instead of the usual narrow slit, 0.002 inch in width, there is an aperture about $^1/_8$ inch square. The rays from the exciting lamp are focused on this, and a second lens focuses the image of the sound track on a selenium cell. It is suggested that the range of tone of the latter is not quite equal to that of a photo-electric cell. It is capable, however, of a current emission about ten times as great as the photo-electric cell. The price of the outfit is approximately 5500 dollars.—*Kodak Abstr. Bull.*

Unbreakable Movie Film. *Sci. Amer.*, April, 1930, p. 299. A regular 16 mm. film is cut in strips $4^3/_4$ inches long. Every strip is then sealed between two pieces of thin steel through which an aperture for each frame has been punched and along the edges of which are a number of holes that are equivalent to the sprocket holes in the film. Each film section is equal in length to 16 frames. The projector consists of a magazine in which the strips are stacked, an electro-magnet to draw the top section, claws to move intermittently past the aperture, and a take-up magazine. As each frame stops in the aperture a 100 watt lamp projects the image onto a mirror placed above the aperture, which mirror deflects the beam of light along a horizontal axis onto a translucent screen. The strips fall by gravity in the take-up magazine from which a conveyor chain transfers them to the bottom of the feed magazine. Test runs exceeding 15,000 passages through the system have shown no wear whatever upon the film. G. L. C.

Analysis of Camera Silencing Devices. *Projection Eng.*, March, 1930, p. 13. The article describes the tests made by a committee of the Academy of Motion Picture Arts and Sciences. It is recommended that the motor be mounted as an integral part of the camera so that any external silencing device will be effective for both. The type of tripod used does not seem to have much effect on the noise. The amount of noise transmitted through the silencing device appeared to be nearly independent of the direction of the pick-up device from the camera. A table gives a comparison of various silencing equipments. The first column gives a brief description of the nature of the silencing equipment. Column 2 shows how much louder the noise of the uncovered camera was than average whispering. The next column shows the sound insulating ability in db. of the various devices

tested. The following column shows how many db. louder or softer is the noise of the camera enclosed in its protecting device than average whispering. The last column indicates whether the tripod is a standard wood tripod or a special tripod. G. L. C.

Orthochromatic and Color Motion Picture Photography: Color Filters. P. LOB AND W. EWALD. *Kinotechnik*, **11**, Sept. 5, 1929, p. 453. Glass, glass mounted, and gelatin filters are studied and compared photographically as well as by means of a spectroscope, micro-actinometer, and photo-cell.—*Kodak Abstr. Bull.*

Study of the Color Sensitiveness of Various Types of Photo-electric Cells. W. F. HESS. *Rensselaer Polytechnic Institute Bulletin*, No. 23, July, 1929. Spectral sensitivity curves from 400 to 800 millimicrons are given for five differently prepared caesium cells, for a rubidium and for a Burt sodium cell, and curves for the uniformity of one type of caesium cell, selecting six at random for the test.—*Kodak Abstr. Bull.*

Soviet Educational Film Production. *Intern. Phot. Bull.*, March, 1930, p. 16. The Soviet motion picture industry is actively engaged in turning out educational, scientific, and social films. Among the films now in production are: "Soviet Fordism," "The Grain Factory," "Hygiene for Women," "National Economy and Culture in the U. S. S. R.," "Coal and Metal." A monthly bulletin is issued for the workers in film studios concerning the achievements of the European and American motion picture industries, with a view to raising the skill of the Soviet workers. G. L. C.

Paris Will Make Crime Talkies. *Intern. Phot. Bull.*, March, 1930, p. 16. Sound pictures are to be used by the Paris Surete Generale to record every question and answer, and every gesture of the examining magistrate and the suspect when the latter undergoes examination. G. L. C.

Muybridge Semi-Centennial. W. R. MILES. *Internat. Phot.*, **1**, June, 1929, p. 18. The author describes the ceremonies held at Stanford University on May 7 and 8, 1929, in honor of the fifteenth anniversary of E. J. Muybridge's experimental work. Leland Stanford, investigating the motion of a horse's legs, arranged to take a series of instantaneous consecutive photographs. This was the forerunner of motion picture photography. When Stanford began his experiments, $^1/_{12}$ of a second exposure was required. The first picture was taken with a single camera and was hand operated, but later twelve cameras were arranged at intervals of 21 inches to take consecutive pictures. The shutter was first operated by a latch string, but later it was arranged that the horse closed an electric circuit at the proper point and thus photographed himself. Contact was also made by a spring operated electrical circuit breaker having one contact for each camera. By means of the electrically operated shutters it was possible to take a number of simultaneous photographs.—*Kodak Abstr. Bull.*

Federal Chemist Warns against Improper Storage of Film. *Mot. Pict. News*, **40**, Section 1, Dec. 28, 1929, p. 22. This is taken from a technical report prepared by C. E. Monroe, chief chemist of the U. S. Bureau of Mines. Flameless combustion of nitrocellulose films accompanied by evolution of nitrous fumes and carbon monoxide can be started at temperatures as low as 150°C. (300°F.), as a result of brief contact with an electric lamp, a heated steam coil, a glowing cigarette, or other sources of heat. No instances of spontaneous combus-

tion resulting from spontaneous decomposition of films have been recorded. Collodion cotton for seventy-five years, at least, has been packed for shipment in cardboard cartons which give sufficient access of air to allow any gases that may be formed to escape. Nitrogen oxides produced during decomposition of films are nitric oxide (NO) and nitrogen tetroxide (NO_2); the former combines rapidly with the oxygen of the air to form the latter gas which is brownish red in color. These gases combine with others and with water to form corrosive acids. A proper supply of water will quench fires in nitrocellulose films.—*Kodak Abstr. Bull.*