to say, the rays of sound, having to pass thru many alternations of rarer and denser air, are reflected and refracted at every transmission, losing in intensity at every change, so that the range of audibility of a bell is always less in sunny weather than in cloudy weather, less during the daytime than at nighttime, less over the land than it is over the sea, and less over the lowlands than it is on the mountain tops. During still quiet nights, beneath a layer of clouds, the atmosphere is usually most homogeneous as to temperature and moisture; and, if there be no wind, sounds are then heard to the greatest distance. There are many peculiarities in the distribution of sound that have been especially studied in connection with fog signals on the coasts of Europe and America, but we believe all have been explained by considering the refraction of sound caused by differences of wind, by differences of density, by the presence of two currents of air passing each other, by the reflection from a sheet of falling rain, by reflection from the waves of the ocean, and by the irregularities of the land. If the audibility of distant sounds is a sign of coming rain, it is generally because the skies have become clouded over, or the wind has shifted preparatory to rain; but not because the air has become more heavily charged with moisture, nor because moist air conducts sound better than dry air, nor because the dense air of a high barometer conducts sound better than the rarefied air of a low barometer, nor because cold air conducts sound better than hot air. These four influences are negligible compared with homogeneity.

The diminution of sound is perfectly analogous to that of light. Everyone knows how easily light passes thru clear air or pure water, but it will not pass thru a mixture of air and water, such as a glass full of bubbles, or a fog or cloud, or a sheet of falling rain.—*C. A.*

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Anderson, Richard.
Lightning conductors; their history, nature, and mode of application. 3d ed. London. 1885. xv, 470 p. 8°.

Angot, Alfred.
Traité élémentaire de météorologie. 2d ed. Paris. 1907. vi, 416 p. 4°.

Austria. K. k. Zentralanstalt für Meteorologie und Geodynamik.
Allgemeiner Bericht und Chronik der im Jahre 1904 in Osterreich beobachteten Erdbeben. No. 1. Offizielle Publikation. Wien. 1906. vii, 155 p. 8°.

Batavia. Koninklijk magnetisch en meteorologisch Observatorium.
Regenwaarnemingen in Nederlandsch-Indie. 27 Jaargang. Batavia. 1906. xi, 380 p. 4°.

Black, W. G.
Ocean rainfall by rain-gage observations at sea. General and special oceans. 1864, 1875, 1881. New ed. [Repr. J. Manchester geogr. soc. v. 14, 1898.] Edinburgh. n. d. 21 p. 8°.

Blanchard, Raoul.
La Flandre. Paris. 1906. viii, 530 p. 4°.

Bouches-du-Rhone. Commission de météorologie.
Bulletin annuel. 1905. Marseille. 1906. x, 113 p. 4°.

Bravo, Carlos.
...La patria Boliviana. Estado geográfica. La Paz. 1894. 204 p. 8°.

Cape of Good Hope. Meteorological commission.
Report 1905. Cape Town. 1906. xiv, 127 p. f°.

Ceylon. Surveyor general.
Meteorology [1905]. (Extr. Ceylon administration reports for 1905.) n. p. n. d. F1-F44 p. f°.

Coester, A. and Gerland, E.
Beschreibung der Sammlung astronomischer, geodätischer und physikalischer Apparate im Königlichen Museum zu Cassel. Cassel. 1878. 48 p. 4.

Courty, Fernand.
Climatologie du littoral Atlantique français... Paris. 1905. 14 p. 8°.

Defant, A[lbert].
Die Anhängigkeit der diffusen Wärmestrahlung von der Jahreszeit. (S.-A. Berichte Nat.-med. Innsbruck. 30. Jahrg. 1905-6.) Innsbruck. n. d.

Dörr, —.
Die Beobachtungsergebnisse der meteorologischen Stationen niederer Ordnung im Herzogtum Braunschweig während des Zeitraumes 1878-1905. (S.-A. Beiträge Statist. Herz. Braunschw. Heft 20. 1907.) 38 p. f°.

Egypt. Survey department.
Meteorological report for the year 1904. Part 1. Cairo. 1906. f°.
Report on the work of the Survey department. 1905. Cairo. 1906. 76 p. 4°.

Guzman, David Y.
Apuntamientos sobre la topografia fisica de la República del Salvador. San Salvador. 1883. xix, [20]-535 p. 8°.

Hamburg. Deutsche Seewarte.
Deutsches meteorologisches Jahrbuch. Hamburg. 1906. vi, 192 p. f°.

Hann, J[ulius].
Der tägliche Gang der Temperatur in der äusseren Tropenzone. A. Das amerikanische und afrikanische Tropengebiet. (Denkschr. Akad. Wien. 80. Bd.) Wien, 1907.

Huggard, W. R. and others.
Davos as health resort... Davos. 1906. iv, 316 p. 8°.

Hungary. Kgl ung. Reichsanstalt für Meteorologie u. Erdmagnetismus.
Bericht über die Tätigkeit. 1905. Budapest. 1906. 30 p. 8°.
Jahrbuch. 34 Band. 1904. Theile 1-3. Budapest. 1906. v. p. f°.

International meteorological committee.
Internationaler meteorologischer Kodex. Im Auftrage des Internationalen meteorologischen Komitees bearbeitet von G. Hellmann und H. H. Hildebrandsson. Deutsche Ausgabe besorgt von dem Königlich preussichen meteorologischen Institut. Berlin. 1907. viii, 81 p. 4°.

Juiz de Fora. Servico meteorologico.
Boletim. 1906. n. p. n. d. f°.

Knoch, Karl.
Die Niederschlagsverhältnisse der Atlasländer. Frankfurt a. M. [1906.] 86 p. 8°.

Krakau. Observatoryum.
...Materyaly zebrane przez sekcye meteorologiczna. [1905.] n. p. n. d. 73 p. 8°.

London. Solar physics observatory, South Kensington.
Report. 1906. n. p. n. d. 15 p. 8°.

Lutz, Karl Wolfgang.
Untersuchungen über atmosphärische Elektrizität mit besonderer Berücksichtigung ihrer technischen Bedeutung. [München. 1904.] 102 p. 4°.

Maugham, R. C. F.
Portuguese East Africa. New York. 1906. xii, 340 p. 8°.

Möller, M.
Flut und Witterung. Braunschweig. 1905. vi, 24 p. 8°.

Moscow. Agricultural institute. Meteorological observatory.
Observations. 1905. Moskva. 1987. xxx, 72 p. 4°.

Pastrana, Manuel E.
La sección meteorológica del estado de Yucatán. Mexico. 1906. 99 p. f°.

Prussia. Königliches preussisches meteorologisches Institut.
Ergebnisse der Beobachtungen an den Stationen II. and III. Ordnung im Jahre 1901... Berlin. 1906. xvi, 124-279 p. f°.

Rakhmanov, G.
Osnovy meteorologii. [Elements of meteorology.] (Russ.) Moskva. 1902. li, 118 p. 8°.

Richter, Eugen.
Die Witterungskunde für den Haus-, Land- und Forstwirt. Regensburg. n. d. 30 p. 16°.

Rizzo, G. B.
Sopra il calcolo della profondità degli ipocentri nei movimenti sismici. (Estr. Accad. sc. Torino. v. 41. 17 giugno 1906.) Torino. 1906. 8p. 8°.
Sulla velocità di propagazione delle onde sismiche nel terremoto della Calabria del giorno 8 settembre 1905. (Estr. Mem. Accad. sc. Torino. Ser. II, Tom. 57. 17 giugno 1906.) Torino. 1906. p. [309]-350. f°.

Royal society of New South Wales.
Journal and proceedings. 1905. Sydney. 1905. v. p. 8°.

Rykachev, M.
Novyii isparitel dlia nabliupenii nad isparenieni travy i pervyia nabliudeniia po nem v Konstantinovskoi observatorii y 1896 g. [New evaporometer for observing evaporation from the grass, and first observations with this instrument at the Constantine observatory in 1896.] St. Petersbug. 50 p. f°. (Mém. Acad. sc., St. Petersburg. 7 sér. Classe phys.-math. v. 7. No. 3.)

South Australia. Government astronomer.
Meteorological observations made at the Adelaide observatory and other places... 1902-3. Adelaide. 1905. xx, 65 p. f°.

Steen, Aksel S.
Report of the Second Norwegian Arctic expedition in the *Fram*. 1898-1902. No. 6. Terrestrial magnetism. Kristiania. 1907. 82 p. 4°.

Stöckigt, Willi.
Ueber den Einfluss der Lage die Temperaturentwickelung der Sommermonate und die Luftfeuchtigkeit an heissen Tagen im Schwarzwaldgebiet . . . Inaug.-Diss . . . Saalfeld. [Jena. 1906.] 72 p. 4°.

Streit, A.
Das Wesen der Cyklonen. Wien. 1906. vi, 125 p. f°.

Thieme, F. W.
Neues und vollständiges Handwörterbuch der englischen und deutschen Sprache. 18. Auflage vollständig neu bearbeitet von Leon Kellnar. 2 Theile. Braunschweig. 1901-5. xlviii, 491; xliv, 597 p. 4°.

Unanue, Hipolito.
Observaciones sobre el clima de Lima . . . Madrid. 1815. (26), 315 p. 8°.

Walker, James.
The analytical theory of light. Cambridge. 1904. xv, 416 p. 4°.

RECENT PAPERS BEARING ON METEOROLOGY.

H. H. KIMBALL, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——

Bulletin of the American geographical society. New York. v. 39. Apr., 1907.
T., R. S. Calabrian earthquakes. p. 236-237.

Bulletin of the geographical society of Philadelphia. Philadelphia. v. 5. Apr., 1907.
Bennett, Helen Christine. Kingston, the capital of Jamaica, as it was and is. p. 1-9. [Graphic description of the Kingston earthquake, January 15, 1907.]
Smith, Philip S. Settlements and climate of the Seward Peninsula, Alaska. p. 10-20. [Climate of Nome and vicinity.]

Nature. London. v. 75.
MacDowall, Alex. B. Rothesay rainfall and the sun-spot cycle. (Mch. 21, 1907.) p. 488.
—— The weather reports of the meteorological office. (Mch. 21, 1907.) p. 488-490.
—— The weather and the crops. (Apr. 4, 1907.) p. 545-546. [Abstract of paper by R. H. Hooker.]

Physical Review. Lancaster. v. 24. Mch., 1907.
Turnbull, W. R. Researches on the forms and stability of aeroplanes. p. 285-302.

Science. New York. New Series. v. 25. Apr. 5, 1907.
Wetherill, Henry Emerson. Some new and useful data in reference to the moisture of the air. [Abstract.] p. 523. [Notice of a cobalt hygroscope.]
Gates, Fanny Cook. On the conductivity of the air caused by certain compounds during temperature changes. [Abstract.] p. 528.
Barus, Carl. On distributions of nuclei and ions in dust-free air. [Abstract.] p. 534-535.
Ward, R. DeC[ourcy]. Cumulus clouds over the San Francisco fire. p. 554-555.

Scientific American. New York. v. 96.
Rotch, A. Lawrence. The meteorological conditions above St. Louis. (Mch. 30, 1907.) p. 271.
—— A great jam on the Susquehanna River. (Apr. 6, 1907.) p. 288.

Scottish geographical magazine. Edinburgh. v. 23. Apr., 1907.
Newbigin, I. The Swiss Valais: a study in regional geography. p. 169-191. [Climate, p. 175-183.]

Symons's meteorological magazine. London. v. 42. Mch., 1907.
Innes, R. T. A. Rain gauge exposure in the Transvaal. p. 21-23.
—— The British weather reports. p. 23-27. [General description, with notes of changes recently introduced. Announces the inauguration of a monthly weather report.]
Krebs, Wilhelm. Qualitative analysis of curve diagrams. p. 27-28.
—— Rain-making experiments in the Klondike. p. 29.
Druce, F. Weather recording. p. 29-31.
Clark, J. Edmund. A relation between rainfall at York and solar cycles. p. 32-33.
Lander, A. The Lander self-recording rain gage. p. 37.

Terrestrial magnetism and atmospheric electricity. Baltimore. v. 11. Dec., 1906.
Oddone, Emilio. Measurements of the electric potential during the total solar eclipse of August 30, 1905, at Tripoli, Barbary. p. 167-180.
—— Adam Paulsen (1833-1907). p. 198.

Transactions of the royal society of Edinburgh. Edinburgh. v. 41. Pt. 3. 1904-5.
Chrystal, [George]. On the hydrodynamical theory of seiches. p. 599-649. [Bibliography, p. 644.]

Annuaire de la Société météorologique de France. Paris. 54 année.
Dongier, R. Introduction à l'étude des phénomènes électriques de l'atmosphère. Radioactivité; ions; electrons. (Août 1906.) p. 213-230. [A popular résumé of recent theories of atmospheric electricity.]
Cœurdevache, P. Variation annuelle de la nébulosité. (Août 1906.) p. 235.
Dufour, Ch. Variation diurne de la pression barométrique à Rikitea. (Oct., 1906.) p. 253-257.
Ouzilleau, —. Note sur le climat de Koury (Soudan Francais). (Oct., 1906.) p. 257-261.
Dufour, Ch. Temperatures extrêmes au sommet de la Tour Eiffel (1889-1906). (Oct., 1906.) p. 262-264.
Moureaux, Th. Résumé de 23 années d'observations de l'insolation au Parc Saint-Maur. (Nov., 1906.) p. 269-274.
Chauveau, A. B. Sur le typhon du 18 septembre a Hong-Kong. (Nov., 1906.) p. 274-276.
Maillet, Edmond. Sur la durée de propagation des maxima des crues dans le bassin de la Seine. (Dec., 1906.) p. 285-288.
Besson, L. Recherches expérimentales sur l'orientation des cristaux de glace atmosphériques. (Fév., 1907.) p. 40-50.
Garrigou-Lagrange, P. Pluies, rivières et sources du Limousin. (Fév., 1907). p. 50-52. [Relations of rainfall to stream flow; experiments under conditions very favorable for observation.]

Bulletin de la Société belge d'astronomie. Bruxelles. 12 année. Mars 1907.
Boutquin, A. De l'emploi des appareils de télégraphie sans fil pour l'observation des courants atmosphériques dans les régions polaires. p. 79-86.

Comptes rendus de l'Académie des sciences. Paris. Tome 144. 18 mars 1907.
Oddone, E. Sur quelques constantes sismiques déduites du tremblement de terre du 4 avril 1904. p. 662-664.

Revue néphologique. Mons. Mars 1907.
Mémery, Henri. La lune "mange-t-elle" les nuages? p. 113-114. [Observations discrediting belief in the moon's effect on clouds.]
B[racke], A. Les nuages de neige cosmiques. p. 114-115. [Review of work by C. Drescher.]
Defant, A[lbert]. Dépendence de la radiation calorifique diffuse de l'époque de l'année. p. 117-120.

Annalen der Hydrographie und maritimen Meteorologie. Berlin. 35 Jahrgang. 1907.
Knipping, E. Der Hongkong-Taifun vom 18 Dezember 1906. p. 97-102.
S., v. Windverhältnisse in Mogadar, der Kamerun-Mündung und der Walfish-Bucht, mit besonderer Berücksichtigung der täglichen Schwankungen. p. 103-108.
Kaiser, Max. Land- und Seewinde an der deutschen Ostseeküste. p. 113-122.
K., E. Zwei Taifune im Golf von Tonkin am 20 und 24 September 1906. p. 136-137.

Meteorologische Zeitschrift. Braunschweig. Band 24. März 1907.
Pernter, J[oseph] M[aria]. Das Ende des Wetterschiessens. p. 97-102.
Ekholm, Nils. Ueber die unperiodischen Luftdruckschwankungen und einige damit zusammenhängende Erscheinungen. p. 102-113.
Woeikow, A. Temperatur des Ural. -Der Juli und September 1906 in Russland. Das aerodynamische Institut bei Moskau. p. 114-119.
Woeikow, A. Das Barometermaximum im Januar 1907. p. 120. [Highest pressure ever observed in western Russia.]
H[ann], J[ulius]. Das ausserordentliche Barometermaximum. p. 121.
E., F. M. Ueber die Theorie der Guilbertschen Regeln der Wettervorhersage von Bernard Brunhes (Arch. d. sciences phys. et. nat., 15 Juli 1906). p. 121-122. [Adverse criticism of Guilbert's rules and Brunhes's discussion of them.]
—— Klima von Buitenzorg. p. 124-129.
—— Ueber die Eisverhältnisse des Ryck unfern des Greifswalder Bodden. p. 129. [Record 1839-1870.]
Schmidt, Ad. Vorläufige Mitteilung über magnetische Variationsbeobachtungen in einem Bergwerk. p. 130-131.
—— Adam Paulsen. p. 138-139.
Exner, Karl. Farbe und Polarisation des Himmelslichtes. p. 139. [An experiment showing color and polarization to be due to the molecules of the air itself.]
Köppen, W. Klassifikation der Klimate. p. 140-142. [Replies to Prof. Ward's criticism of Köppen's classification.]
Hann, J[ulius]. Temperatur von Bombay und Kalkutta. p. 142. [Corrects an error in Hann's Lehrbuch der Meteorologie.]