this débris dam that the greatest damage usually occurs, since the breaking of the dam at its weakest point usually results in the formation of new deep gulches in unexpected places, down which the liberated water and sludge rush toward the flatter marginal slopes of the fan, dividing and again dividing into smaller, less well-defined channels as they go. So far as observed, the end point of these cloudbursts is to be found in the thin irregular flows of mud left upon the lower slopes of the fans. These are in some places thick enough to obliterate the low bunchy grasses across which they have spread, and are characterized by a homogeneous, regularly cracked surface and an even, fine grain. Such thin, irregular mud beds are known by the well diggers of the region as "slickens."

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Librarian.

The following have been selected from among the titles of 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 lent for a limited time to officials and employees who make application for them. Anonymous publications are indicated by a ——.

[Aiginetos, Demetrios.] *Αἰγινῆτος, Δημήτριος.*
Τὸ κλίμα τῆς Ἑλλάδος. Ἐν Ἀθῆναις. 1908. 2 v. 8°.

Angström, Knut.
...Einige fundamentale Sätze betreffs der Absorption und der Absorptionsspektrum der Gase. Uppsala. 1908. 13 p. 8°. (Archiv. för matematik, astronomi och fysik... Band 4, n:o 30.)

Astrophysical journal.
A general index. Chicago. 1908. 133 p. 8°.

Austria. Hydrographischer Dienst.
Jahrbuch...13. Jahrgang. 1905. Wien. 1907. f°.

Behre, Otto.
Das Klima von Berlin. Eine meteorologisch-hygienische Untersuchung. Berlin. 1908. 159 p. 8°.

Bendel, Johann.
Wetterpropheten. Regensburg. 1904. 166 p. 8°. (Naturwissenschaftliche Jugend- und Volksbibliothek. 7 Bändchen.)

Canada. Department of the interior.
Canada's fertile northland... Ottawa. 1907. 139 p. 4°.
Maps. Canada's fertile northland. Ottawa. 1907. 5 maps.

Ciofalo, Michele.
Il clima di Termini dedotto dalle osservazioni meteorologiche del periodo 1880–1906. Termini. 1907. 72 p. f°.

Climate and health [of Sao Paulo].
In The state of Sao Paulo, Brazil. Statistics and general information, 1903. Department of agriculture, commerce, and public works of the state of Sao Paulo (Brazil). Sao Paulo. 1904. p. 12–18. 12°.

Contreras, Juan N.
Meteorologia practica. Nuevos metodos de prediccion. 2 parts. Mexico. 1907, 1902. 328, 54 p. 8°. 12°.

Crelle, A. L.
Dr. A. L. Crelle's Rechentafeln... Neue Ausgabe. Berlin. 1907. n. p. f°.

Dairen (South Manchuria). Meteorological observatory.
Report of the meteorological observations made at the Japanese meteorological stations in Manchuria. 1906. Dairen. [1908.] v. p. f°.

Fairbanks, Harold W.
The great earthquake rift of California. *In* Bulletin of the California physical geography club. Oct., 1907. Oakland. p. 1–8.

Ficker, Heinz v.
Zur Meteorologie von West-Turkestan. Wien. 1908. 35 p. f°. (Besonders abgedruckt aus dem 81. Bande der Denkschriften der mathematisch-naturwissenschaftlichen Klasse der Kaiserlichen Akademie der Wissenschaften.)

Findeisen, F.
Praktische Anleitung zur Herstellung einfacher Gebäude-Blitzableiter. 2d ed. Berlin. 1907. vi, 126 p. 8°.

Freybe, Otto.
...Klima- und Witterungskunde. Hannover. 1908. iv, 71 p. 12°. (Bibliothek der gesamten Landwirtschaft. Hrsg. von der Karl Steinbrück. 10. Band.)

Geographisches Jahrbuch.
31. Band, 1908. Gotha. 1908. ix, 493 p. 8°.

Gerdien, H.
...Untersuchungen über die atmosphärischen radioaktiven Induktionen. Berlin. 1907. 75 p. 4°. (Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-physikalische Klasse. Neue Folge. Band 5. Nro. 5.)

Great Britain. Meteorological committee.
3d annual report. London. 1908. 164 p. 8°.

Greim, G.
Schätzung der mittleren Niederschlagshöhe im Grossherzogtum Hessen im Jahre 1905 und Vergleichung der Niederschlagshöhen des Grossherzogtum im Jahrfünft 1901–5. Darmstadt. 1906. p. 59–64. 8°. (S.-A. Notizbl. Ver. Erdk. 4 Folge. Heft 27. 1906.)

Hellman, G[ustav].
...Meteorologische Volksbücher. Ein Beitrag zur Geschichte der Meteorologie und zur Kulturgeschichte. Berlin. 1895. 68 p. 4°. (Sammlung populärer Schriften herausgegeben von der Gesellschaft Urania zu Berlin. no. 8.)

Hesse. Grossherzogliches hydrographisches Bureau.
Deutsches meteorologisches Jahrbuch 1907. Darmstadt. 1908. 59 p. f°.

Klengel, Friedrich.
Die Niederschlagsverhältnisse von Deutsch-Südwestafrika. Leipzig. 1908. 72 p. 8°.

Kienast, Hermann.
Das Klima von Königsberg i. Pr. Teil. 3. Der jährliche Gang der Lufttemperatur, dargestellt auf Grund der Beobachtungen aus den Jahren 1848–1906. Königsberg. 1907. 45 p. f°.

McAdie, Alexander G.
Frost, snow, and dew. First paper. *In* Sunset magazine. San Francisco. Feb., 1908. p. 336–338.
Earthquake weather. *In* Bulletin of the California physical geography club. Oakland. Oct., 1907. p. 8–9.

Mainka, C.
Kurze Uebersicht über die modernen Erdbeben-Instrumente und einige Winke für die Konstruktion solcher. Berlin. 1907. 32 p. 4°.
Ueber die neueren Arbeiten im Observatorium der Kaiserlichen Hauptstation für Erdbebenforschung in Strassburg i. Els. Haag. 1907. 11 p. 4°.

Maryland geological survey.
[General report.] v. 6, 1906. Baltimore. 1906. 578 p. 4°.

Mauritius. Royal Alfred observatory.
Annual report...1907. n. p. 1908. 18 p. f°.

Mill, Hugh Robert.
British rainfall 1907. London. 1908. 100 [200] p. 8°.

New South Wales. Royal society.
Journal and proceedings...1907. v. 41. Sydney. 1908. xii, 218, xxvi p. 8°.

Physikalische Verein.
Jahresbericht...1906–7. Frankfurt am Main. 1908. 110 p. 8°.

Regulamento do Serviço meteorologico de S. Paulo.
In Boletim de agricultura. 9 sér. Maio N. 5. Anno de 1908. Sao Paulo. 1908. p. 381–385. 8°.

Roumania. Institutul meteorologic.
Buletinul lunar al observatiunilor meteorologice. Anul 15, 1906. Bucuresti. 1907. 252 p. f°.
Same. Anul 16, 1907. Bucuresti. 1908. 263 p. f°.

Saxony. Königliches sächsisches meteorologisches Institut.
Deutsches meteorologisches Jahrbuch. 1903. Dresden. 1908. 180 (94) p. f°.

Scheiner, J[ulius].
Populäre Astrophysik. Leipzig. 1908. vi, 718 p. 30 pl. 8°.

Schubert, Johannes.
Das Klima von Ostpreussen. Eberswalde. 1908. 18 p. 12°.
Landsee und Wald als klimatische Faktoren. Leipzig. 1908. p. 688–694. 8°. (Sonderabdruck aus den 13. Jahrgange der Geographischen Zeitschrift.)

Siam society.
Rainfall records of the kingdom of Siam. (Journal of the Siam society. v. 4, part 2.) Bangkok. 1907. [60] p. 8°.

Southern Rhodesia. Statist.
Report on meteorology. London. 1908. 24 p. f°.

Urriola, Ciro L.
Sur les variations de la température... Panama. 1908. 26 p. 8°.

Walter, A.
On the influence of forests on rainfall and the probable effect of "déboisement" on agriculture in Mauritius. Mauritius. 1908. 51 p. f°.

Wyoming climate.
In Cheyenne, Wyoming, the city of opportunity. Issued by the Industrial club of Cheyenne. Cheyenne. [1908.] p. 20–21. 12°.

Zöppritz, August.
Prognosen aus den Gestirnstellungen für das Jahr 1908. Stuttgart. [1908. 34 p.] 8°.

RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.

C. FITZHUGH TALMAN, 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

OGICAL OFFIC

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 ——

American geographical society. Bulletin. New York. v. 40. September, 1908.

Huntington, Ellsworth. The climate of ancient Palestine. p. 513-522.

Science. New York. New series. v. 28. October 9, 1908.

Shaw, W. N. Address of the president to the mathematical and physical section of the British association for the advancement of science. p. 457-471.

Archives des sciences physiques et naturelles. Genève. Tome 26. 15 September, 1908.

Ramsay, William. Les gaz inertes de l'atmosphére et leur derivation de l'emanation des corps radioactifs. p. 240-262.

Nature. Paris. 36 année. 12 Septembre, 1908.

—— E. Mascart. p. 238-240. [With portrait.]

Revue néphologique. Mons. No. 32. Août 1908.

Leal Mariano. A propos d'un nouvel anémomètre enregistreur. p. 49-50.

Geographische Zeitschrift. Leipzig. 14 Jahrgang. September, 1908.

Mecking, Ludwig. Der heutige Stand der Geographie der Antarktis. II. Das Klima. p. 481-492.

Meteorologische Zeitschrift. Braunschweig. Band 25. September, 1908.

Obermayer, A. von. Zwanzig Jahre meteorologischer Beobachtungen auf dem Ben Nevis. p. 385-396.

Russeltvedt, Nils. Ein neues Haarhygrometer. [Illustrated.] p. 396-400.

Meissner, Otto. Die Luftbewegung in Potsdam (1894 bis 1900). p. 400-409.

—— A. Gockel über den Gehalt der Bodenluft an radioaktiver Emanation. p. 410-412.

Busch, Fr. Eine neue Störung der atmosphärischen Polarisation. p. 412-414.

Sch., E. Schubert, der Wasserhaushalt an der Erdoberfläche. [Review.] p. 415-416.

Heidke, P. Resultate der meteorologischen Beobachtungen zu Kwai (Usambara) in den Jahren 1897 bis 1902. p. 416-418.

—— Meteorologische Beobachtungen im arktischen Nordamerika auf Herschel Island 1905. p. 418-419.

Friesenhof, Gregor. Zur lokalen Entstehung der Zyklonen. p. 419-420.

H[ann], J[ulius]. Stündliche Intensität der Regen zu Batavia und Pasuruan. p. 422.

Maurer, Hans. Regenmengen im Nigergebiet. p. 423-425.

Siegel, Fr. Meteorologisches Observatorium erster Ordnung zu Curityba (Paraná). p. 426-427.

Little, C. Ueber eine Windstille Region in 3,000 bis 4,000 engl. Fuss Seehöhe in der kalten Jahreszeit in der Gegend von Calcutta. p. 427.

Hann, J. Regenfall zu Pernambuco (Recife). [Collected data, 1887-1906.] p. 429.

Physikalische Zeitschrift. Leipzig. 9. Jahrgang. 15 September, 1908.

Kaufmann, W. Leuchtende Wolke. [Includes photograph of sky glow, July 2, 1908]. p. 606-607.

Wetter. Berlin. 25. Jahrgang. September, 1908.

Grundmann, G. Ueber einen einfachen Gewitterregistrator mit dem Verbesserten Schreiberschen Nadelkohärer. [Illustrated.] p. 193-201.

Schulze, Paul. Ludwig Friedrich Kämtz. p. 201-203.

Joester, Karl. Die Föhnerscheinungen im Riesengebirge. p. 203-206.

Becke, L. von der. Die Ergebnisse meteorologischer Beobachtungen auf der Lloyds-Signalstation auf Kap Spartel für das Jahr 1907 in Monats-und Jahresmitteln. p. 209-211.

Freybe, Otto. Ein Vormittag an einer Wetterdienststelle. p. 213-216.

AN ANNOTATED BIBLIOGRAPHY OF EVAPORATION.

By MRS. GRACE J. LIVINGSTON. Dated Washington, D. C., January 8, 1908.

[*Continued from the Monthly Weather Review, June, 1908.*]

1782.

Eason, Alexander.

On the ascent of vapor. (1782.) Mem. lit. phil. soc., 1785, **1**:395-405.

1786.

Rosenthal, Gottfried Erich.

Ueber P. Cotte's Versuch die Stärke der Ausdünstungs im Rücksicht auf die Höhe und den Durchmesser der Gefässe die zum Maasse gebraucht werden. Mag. neu. Phys., 1786, 1 (pt. 4):142-54.

It is claimed that the law of differences, for evaporation from different vessels, which Cotte (1781) failed to find, is as follows: (1) dishes of like height and surface give like evaporation in the same time and place; (2) dishes of like height and unlike evaporating surfaces give the same evaporation if reckoned by depth, but different if by volume; (3) in the case of dishes of different heights, with like or unlike evaporating surfaces, the depth of water lost by evaporation is proportional to the square roots of their heights.

Williams, Samuel.

Experiments on evaporation, and meteorological observations made at Bradford, in New England, in 1772. Trans. Amer. phil. soc., 1786, **2**:118-41.

In experiments with evaporation from two small vessels, the amount lost from the one refilled every week was found to be greater than that from the dish which was refilled only once a month. A vessel floated in the Merrimac River during a calm, rainless week lost 0.15 in. by evaporation, while a similar vessel freely exposed in the open air lost 1.50 in. Evaporation was found to be greater from soil covered with vegetation than from an equal area of free water surface.

1787.

de Saint-Lazare, Bertholon.

De l'électricité des meteores. Paris. 1787. 2 v. 8vo.

In volume 2, p. 84-99, a chapter "Sur l'évaporation" proposes an electrical theory for explaining evaporation.

1788.

Cotte, P.

Mémoires sur la météorologie. Paris. 1788. 2 v. 4to.

Discounts (**1**:100) the influence of moonlight on evaporation. Reviews (**1**:175-265) experimental and theoretical investigations of various physicists, including Wallerius, Lambert, Musschenbroek, Van Swinden, Richmann, Kratzenstein, Hamberger, Homberg, Desaguliers, Franklin, Kames, Dobson, Achard, etc. Describes experiments as in 1781, to ascertain the influence of the diameter and height of the containing vessels upon the rate of evaporation. Describes (**1**:280) a simple evaporator used by Chevalier de la Mark. Discusses (**1**:480) the cooling effect of evaporation as demonstrated with the moistened bulb of a thermometer.

1789.

Saussure, H. B. de.

Col du Géant; expériences sur l'évaporation. Obs. phys., 1789, **34**:161-80. Translated in Jour. Phys., Leipsic, 1790, **1**:453-73. Reprinted in Voyages dans les Alpes. Geneva, 1779-96. 4 v. 4to.

Evaporation from a piece of moist linen stretched in a frame, was observed on the Col du Géant, where the air pressure is only 18 in. 9 lines, and at Geneva, Switzerland, where it is 27 in. 8 lines, with the result that "other things being equal, a lowering of the pressure of the air by approximately a third makes the quantity of evaporation more than twice as great." Deals also with the cooling effect produced by evaporation.

1790.

Deluc, John Andrew.

Seconde lettre à M. Delamétherie sur la chaleur, la liquefaction, et l'évaporation. Obs. phys., 1790, **36**:193-207. Translated in Jour. Phys., Leipsic, 1790, **2**:402-29.

Discusses theories to explain the process of evaporation. That of the solution of water by air is considered "a vague hypothesis without solid foundation and useless to explain the phenomenon." He maintains that evaporation proceeds from the union of fire with the molecules of the liquid.

Hube, J. M.

Ueber die Ausdünstung und ihre Wirkungen in der Atmosphäre. Leipsic. 1790. 2 v. in 1. 8vo.

Monge, Gaspard.

Sur la cause des principaux phénomènes de la météorologie. Ann. chim. phys., 1790, **5**:1-71.

The vesicular hypothesis of evaporation is rejected in favor of the theory of the solution of water vapor in the air, on the following grounds: (1) Air in absorbing water preserves its transparence, which could not happen if the water was merely suspended by some mechanical means; (2) the solvent power of air diminishes as the quantity of water dissolved increases, so that an actual saturation is reached; (3) the point of saturation varies with the temperature of the air, so that air saturated at a high temperature contains more water than air saturated at a lower temperature; (4) if air saturated with water is cooled it becomes supersaturated and abandons the water which its former higher temperature permitted it to retain. It is concluded that, since these circumstances ordinarily accompany all solutions and are generally regarded as characteristic of them, the absorption of water by air is the result of a true solution.

1791.

Deluc, J[ohn] A[ndrew].

Examen d'un mémoire de M. Monge, sur la cause des principaux phénomènes de la météorologie. Ann. chim. et phys., 1791, **8**:73-102. Translated in Jour. Phys. Leipsic, 1792, **6**:121-48.

It is maintained that Le Roy's experiments at Montpelier, which Monge (1790) accepted as decisive proof that evaporation is the solution of water in air, are better explained by considering fire as the sole agent.

Vassali-Eandi, A. M.

Esame delle teorie dei principali fenomeni della meteorologica del Sign. Monge, colle riflessione del Sign. ———. Biblioteca oltremontana. Turin. 1791.

1792.

Deluc, John Andrew.

On evaporation. Phil. trans., 1792, **82**:400-28. Also in Phil. trans., abridged, 1791-96, **17**:259-63. Translated in Jour. Phys. Leipsic, 1794, **8**:141-60, 293-302.

The fact that every liquid cools when it evaporates is considered a most decisive reason for the opinion that the dissolution of water, observed in the phenomenon of evaporation, results directly from the action of heat without the intervention of air. Hygrology is defined as the science of the causes of evaporation and the modifications of evaporated water. A discussion of hygrometry follows with the conclusion that the product of evaporation is always an expansible fluid which affects the manometer by pressure and the hygrometer by moisture, without any hitherto perceived influence from the presence or absence of air.