Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Red Bank Creek.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Brookville, Pa	35	8	0.4	4	—0.9	29-31	—0.5	1.3
Beaver River.								
Ellwood Junction, Pa	10	14	3.3	2	0.4	31	1.5	2.9
Big Sandy River.								
Louisa, Ky	26	20	20.1	15	4.4	31	8.2	15.7
Cumberland River.								
Burnside, Ky	434	50	37.4	14	1.8	31	9.2	35.6
Carthage, Tenn	257	30	26.3	16	2.8	31	10.2	23.5
Nashville, Tenn	175	40	38.2	18	4.4	31	13.6	33.8
Great Kanawha River.								
Charleston, W. Va	61	30	21.0	14	4.7	25,26	7.2	16.3
New River.								
Radford, Va	153	14	2.0	14	0.5	29,30	0.9	1.5
Hinton, W. Va	95	14	9.8	14	1.9	30,31	3.2	7.9
Licking River.								
Falmouth, Ky	30	25	16.4	12	1.7	31	5.6	14.7
Miami River.								
Dayton, Ohio	69	18	4.6	3	2.0	31	2.9	2.6
Monongahela River.								
Weston, W. Va	161	18	.....	.....	.....	.....	.....	.....
Fairmont, W. Va	119	25	15.1	14	0.6	31	3.1	14.5
Morgantown, W. Va	95	20	18.2	14	7.2	30,31	9.1	11.0
Greensboro, Pa	81	18	17.0	14	7.6	1,25-31	9.4	9.4
Lock No. 4, Pa	40	28	20.6	15	6.6	31	9.8	14.0
Cheat River.								
Rowlesburg, W. Va	36	14	7.0	3,14	2.0	1,10,11	4.3	5.0
Youghiogheny River.								
Confluence, Pa	59	10	5.5	2	1.0	31	2.8	4.5
West Newton, Pa	15	23	6.4	3	0.9	30,31	2.5	5.5
Tennessee River.								
Knoxville, Tenn	614	29	.....	.....	.....	.....	.....	.....
Rockwood, Tenn	519	20	.....	.....	.....	.....	.....	.....
Chattanooga, Tenn	430	33	22.4	15	4.1	30	8.3	18.3
Bridgeport, Ala	390	24	17.1	16	2.5	31	6.4	14.6
Florence, Ala	220	16	13.6	17,18	2.7	30,31	6.3	10.9
Johnsonville, Tenn	94	21	19.5	19,20	4.8	31	10.1	14.7
Wabash River.								
Terre Haute, Ind	165	16	9.2	14	2.8	31	5.5	6.4
Mt. Carmel, Ill	50	15	10.4	16	5.0	31	7.7	5.4
Red River								
Arthur City, Tex	668	27	21.9	14	5.2	10	11.8	16.7
Fulton, Ark	565	28	26.0	17	6.8	11	14.9	19.2
Shreveport, La	449	29	15.1	25-27	8.1	14	12.2	7.0
Alexandria, La	139	33	30.5	1	15.7	17	17.6	4.8
Atchafalaya River.								
Melville, La	100*	31	36.1	15	35.2	30,31	35.8	0.9
Ouachita River.								
Camden, Ark	340	39	8.4	1	4.3	29-31	6.0	4.1
Monroe, La	100	40	35.5	1	28.4	31	31.8	7.1
Yazoo River.								
Yazoo City, Miss	80	25	31.5	1,2	27.6	31	30.0	3.9
Tombigbee River.								
Columbus, Miss	285	33	6.8	16	—1.6	31	2.3	8.4
Demopolis, Ala	155	35	19.2	17	1.5	31	9.0	17.7
Black Warrior River.								
Cordova, Ala	155	20	7.1	13	2.0	31	3.5	5.1
Tuscaloosa, Ala	90	38	20.5	15	2.0	31	6.9	18.5
Alabama River.								
Montgomery, Ala	265	35	8.3	2	1.8	31	4.0	6.5
Selma, Ala	212	35	11.0	3	2.6	31	6.1	8.4

Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Coosa River.	*Miles*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Rome, Ga	225	30	5.0	15	1.9	30,31	2.9	3.1
Wilsonville, Ala	66	15	3.9	17	2.7	30,31	3.3	1.2
Tallapoosa River.								
Sturdevant, Ala	69	15	2.3	1	0.7	31	1.4	1.6
Savannah River.								
Augusta, Ga	130	32	16.9	2	6.8	28,29,31	8.7	10.1
Edisto River.								
Edisto, S. C	75	6	4.2	8	1.5	31	3.1	2.7
Congaree River.								
Columbia, S. C	37	15	3.4	4	1.3	7,8	1.7	2.1
Santee River.								
St. Stephens, S. C	50	12	7.3	10	3.5	31	6.2	3.8
Wateree River.								
Camden, S. C	45	24	11.8	15	4.8	29	7.2	7.0
Black River.								
Kingstree, S. C	60	12	7.9	17	4.7	31	6.9	3.2
Pedee River.								
Cheraw, S. C	145	27	14.9	3	2.4	31	5.3	12.5
Lynch Creek.								
Effingham, S. C	35	12	9.3	9,10	3.5	27,28	5.8	5.8
Lumber River.								
Fair Bluff, N. C	10	6	4.5	8	1.0	31	3.2	3.5
Waccamaw River.								
Conway, S. C	40	7	4.0	18	2.2	31	3.3	1.8
Cape Fear River.								
Fayetteville, N. C	100	38	17.4	15	4.0	29	7.0	13.4
James River.								
Lynchburg, Va	257	18	10.4	14	0.9	31	2.7	9.5
Richmond, Va	110	12	7.4	16	0.1	1,31	1.6	7.3
Potomac River.								
Harpers Ferry, W. Va	170	16	11.7	15	1.5	1	5.4	10.2
Susquehanna River.								
Wilkesbarre, Pa	178	14	.....	.....	.....	.....	.....	.....
Harrisburg, Pa	70	17	7.9	16	3.1	1,2	5.0	4.8
W. Br. of Susquehanna.								
Lock Haven, Pa	63	10	4.5	4	1.0	30,31	2.2	3.5
Williamsport, Pa	35	20	8.8	4	2.0	31	4.9	6.8
Juniata River.								
Huntingdon, Pa	80	24	7.2	3	3.5	30,31	4.4	3.7
Sacramento River.								
Redbluff, Cal	241	23	6.9	3	3.7	28-31	4.8	3.2
Sacramento, Cal	70	28	22.5	7	19.6	30,31	21.3	2.9
Willamette River.								
Eugene, Oreg	149	10	5.2	14,15	3.2	29	4.3	2.0
Albany, Oreg	99	20	6.0	7,14-16	3.8	29	5.1	2.2
Salem, Oreg	69	20	6.2	14,15	3.7	31	5.3	2.5
Portland, Oreg	10	15	23.7	24,25	15.8	5	20.1	7.9

Late reports, April, 1897.

Eugene, Oreg	149	10	8.0	10,17,18	4.4	30	6.4	3.6
Albany, Oreg	99	20	11.2	8	6.0	30	9.0	5.2
Salem, Oreg	69	20	11.6	20	6.4	30	9.5	5.2

* Distance to the Gulf of Mexico.
† Record for 30 days.
‡ Record for 24 days.

SPECIAL CONTRIBUTIONS.

RECENT PUBLICATIONS.

By HERMAN W. SMITH, Librarian, Weather Bureau.

Austria.—Hartl, Heinrich. Meteorologische und Magnetische Beobachtungen in Griechenland. Wien, 1897. 8vo. 32 pp. 1 chart.

Pernter, J. M. Die Farben der Regenbogen und der weisse Regenbogen. Wien, 1897. 8vo. 101 pp. 3 pls.

British Empire.

England.—Baxendell, Joseph. An account of an Investigation, as to Short-period Cyclical Changes in the Magnetic Conditions of the Earth, and in the Distribution of Temperature on its Surface. Liverpool, 1897. 8vo. 7 pp.

Baxendell, Joseph.—The Fernley Observatory. Report and Results of Observations, for the year 1896. Southport, 1897. 8vo. 30 pp.

France.—Commission Météorologique du Département de Vaucluse. Compte-Rendu pour l'Année 1896. Avignon, 1896. 4to. 31 pp.

Germany.—Klein, Hermann J. Jahrbuch der Astronomie und Geophysik. VII Jahrgang 1896. Leipzig, 1897. 8vo. x, 400 pp.

Marcuse, Adolf.—Die atmosphaerische Luft. Eine allgemeine Darstellung ihres Wesens, ihrer Eigenschaften und ihrer Bedeutung. Berlin, 1896. 8vo. 76 pp.

Schneider, Phil. Emil.—Enstehung und Prognose der Wirbelstürme. Regensburg, 1895. 8vo. 112 pp. 24 pls.

Netherlands.—Observations made at the Magnetic and Meteorological Observatory at Batavia. Vol. XVIII. 1895. Batavia. Folio 256 pp.

Regenwaarnemingen in Nederlandsch-Indie. Jaargang 1895. Batavia. 8vo. x, 423 pp.

Sweden.—Hildebrandsson, H. Hildebrand.—Quelques recherches sur les centres d'Action de l'Atmosphère. Stockholm, 1897. 4to. 36 pp. 7 pls.

United States of America.

Connecticut.—Ninth Annual Report of the Storrs Agricultural Experiment Station. Middletown, 1897. 8vo. 292 pp.

Twentieth Annual Report of the Connecticut Agricultural Experiment Station. New Haven, 1897. 8vo. 414 pp.

District of Columbia.—Langley, S. P.—Memoir of George Brown Goode, 1851-1896. Washington, 1897. 8vo. 30 pp.

Illinois.—Crehore, Albert Cushing and Squier, George Owen. The Synchronograph. A new method of rapidly transmitting intelligence by the alternating current. Chicago, 1897. 8vo. 31 pp. 5 pls.

Massachusetts.—Means, James. The Aeronautical Annual for 1897. Boston, 1897. 8vo. 176 pp. 18 pls. and 1 diagram.

North Dakota.—Fourth Annual Report of the North Dakota Weather Service. Fargo, 1897. 8vo. 78 pp.

Pennsylvania.—Twenty-second Annual Report of the Board of Directors of the Philadelphia Maritime Exchange. Philadelphia, 1897. 8vo. 101 pp.

South Carolina.—Third Annual Report of the West Virginia State Board of Agriculture, 1895 and 1896. Charleston, 1897. 8vo. 195 pp.

Uruguay.—Honoré, Carlos. El Sol. Montevideo, 1897. 8vo. 230 pp.

CLOTHING AND TEMPERATURE.

W. F. R. PHILLIPS, M. D., in charge of Section of Climatology, U. S. Weather Bureau.

To acquire some concrete idea of the influence of general meteorological conditions upon personal comfort and upon the efficiency of clothing in different conditions of weather, the writer undertook a series of observations of the temperature of certain parts of the clothing and of the body.

The series comprised observations of temperature between the coat and vest, the vest and linen shirt, the linen shirt and woolen undershirt, the undershirt and skin, and the temperature of the body under the tongue.

The series may, for convenience, be subdivided into four sets or subseries: 1st, a set of observations made indoors; 2d, a set made after free exposure out of doors for ten minutes; 3d, a set made after free exposure out of doors for twenty minutes; 4th, a set made ten minutes after returning indoors. All observations were made in the shade; the first and fourth sets in a room in the Weather Bureau building, and the second and third in the shade of the same building, and in situations so chosen as not to interfere with the free movement of the wind.

The thermometers were in position for ten minutes before the readings were recorded for the first set, and the readings for the other sets were made at the consecutive ten, twenty, and thirty minute periods thereafter.

The period of the day selected for the series was that between 1:50 and 2:30 p. m. This period was selected in order that the outdoor sets might coincide approximately with the 2 p. m. local meteorological observation made by the Weather Bureau in this city (Washington).

The first observations of the series were made on February 4, and the last on February 16, 1897, eleven days in all. The continuity of the record of the temperature of the body in the mouth was broken by an injury to the clinical thermometer on February 11; a new one was obtained and used on February 16. The series was terminated sooner than contemplated by an attack of bronchitis, rendering it imprudent to continue the personal exposure involved in the prosecution of the observations in cold air.

The clothing worn during the series consisted of a serge coat and vest, a linen shirt, and woolen undershirt. This weight of clothing was very comfortable while indoors, and with the addition of an overcoat was ample for outdoors, but while making the observation no overcoat or additional clothing was worn. The coat and vest were single lined with a light-weight material, the linen shirt of the usual quality, and the woolen undershirt of the material known as fleece-lined flannel.

The following are the average values of each of the subseries, and also the average of the 2 p. m. local meteorological observation. The details of each are shown in the appended table.

Details of observations of bodily temperature and that of clothing, etc.

	February, 1897.											Average.
	4	5	6	8	9	10	11	12	13	15	16	
First set. Indoors:												
Temperature—												
of room	79.1	77.8	78.0	73.0	78.0	75.5	78.0	75.0	76.5	75.0	76.0	76.5
body	98.7	98.4	98.5	98.4	98.4	98.3	.....	.....	.....	.....	98.5	98.5
between undershirt and skin	95.0	96.0	95.2	95.5	95.6	95.8	94.2	96.5	95.4	95.0	95.2	95.5
linen shirt and undershirt	92.8	89.0	90.0	88.5	89.3	90.3	93.0	92.3	88.5	91.3	88.0	90.3
vest and linen shirt	90.7	86.5	88.2	85.5	86.4	86.8	87.2	88.8	87.5	86.3	85.5	87.4
coat and vest	89.6	84.5	86.0	83.0	83.2	84.8	85.2	86.0	83.8	83.6	84.2	84.9
Second set. Outdoors ten minutes:												
Temperature—												
of body	98.4	98.2	98.2	98.3	98.3	98.2	.....	.....	.....	.....	98.4	98.3
between undershirt and skin	94.6	93.0	95.2	93.8	93.0	94.8	92.2	94.8	93.8	94.3	92.2	93.8
linen shirt and undershirt	82.2	80.0	82.0	81.0	78.7	81.4	81.3	81.8	79.0	87.2	80.5	81.3
vest and linen shirt	71.5	71.2	76.4	78.6	71.4	76.0	70.0	77.0	73.0	80.6	74.5	74.6
coat and vest	63.0	62.8	70.2	68.0	59.0	66.7	60.0	65.2	62.5	74.5	66.5	65.3
Third set. Outdoors twenty minutes:												
Temperature—												
of body	98.0	98.0	98.1	98.1	98.0	97.8	.....	.....	.....	.....	98.0	98.0
between undershirt and skin	92.3	91.8	94.0	93.2	92.2	94.0	90.6	94.4	92.2	93.5	90.0	92.6
linen shirt and undershirt	77.9	78.0	79.0	76.7	76.7	77.0	78.6	76.3	78.3	84.5	76.0	78.1
vest and linen shirt	65.2	67.2	77.4	73.3	67.0	69.0	64.3	69.5	72.2	78.0	67.8	68.7
coat and vest	57.5	60.0	66.8	62.0	56.6	61.4	55.5	61.5	59.4	71.0	60.6	61.1
Fourth set. Ten minutes after returning indoors:												
Temperature—												
of room	73.3	77.0	77.4	73.0	77.0	75.0	74.0	76.5	74.8	75.7	75.0	75.7
body	98.0	97.9	98.1	98.1	.....	97.7	.....	.....	.....	.....	97.9	98.0
between undershirt and skin	94.0	92.0	95.0	93.6	93.0	94.6	90.8	94.6	92.2	93.3	91.0	93.1
linen shirt and undershirt	90.4	86.5	88.0	85.5	82.2	87.0	87.0	85.0	84.8	88.2	83.5	86.3
vest and linen shirt	85.3	79.3	83.7	81.3	76.0	82.7	77.3	79.8	82.5	83.0	78.5	80.8
coat and vest	82.8	75.5	81.0	77.4	73.2	80.0	75.2	77.0	78.8	79.5	76.5	77.9
2 p. m. meteorological observation:												
Dry thermometer	37.8	35.0	51.0	34.2	37.0	37.2	33.2	32.6	41.0	50.5	43.2	39.3
Wet thermometer	31.0	32.0	50.0	34.0	33.0	33.7	31.2	32.1	37.0	45.0	37.0	36.0
Relative humidity (per cent)	44	72	93	98	65	69	80	95	68	65	55	73
Absolute humidity (grains per cubic foot)	1.19	1.74	3.95	2.24	1.67	1.75	1.82	2.00	2.05	2.70	1.82	2.06
Velocity of wind (miles per hour)	9	10	15	2	14	3	8	5	5	6	14	8.3
Subjective sensation:												
Indoors	Very warm; slight perspiration.	Warm.	Warm and dry.	Comfortable.	Very warm; slight perspiration.	Warm.	Very warm.	Warm.	.....	.....	.....	.....
Outdoors	Cold; fingers painful.	Cold as preceding day.	Cold, but not unpleasant.	Cold and chilly.	Cold, but not chilly.	Cool, agreeable.	Cold and chilly.	Cold and chilly.	.....	.....	.....	.....