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# EXECUTIVE DOCUMENTS

OF THE

## HOUSE OF REPRESENTATIVES

FOR THE

SECOND SESSION OF THE FIFTY-FIRST CONGRESS.

1890-'91.

WITH INDEX.

IN THIRTY-EIGHT VOLUMES.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1891.

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51ST CONGRESS, } HOUSE OF REPRESENTATIVES. { Ex. Doc. 1,  
2d Session. } Part 2.

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REPORT  
OF THE  
SECRETARY OF WAR;  
BEING PART OF  
THE MESSAGE AND DOCUMENTS  
COMMUNICATED TO THE  
TWO HOUSES OF CONGRESS  
AT THE  
BEGINNING OF THE SECOND SESSION OF THE FIFTY-FIRST CONGRESS.  
—  
IN FOUR VOLUMES.

—  
VOLUME I.  
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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1890.



A—GENERAL RETURN ON EXHIBIT OF THE ACTUAL STRENGTH OF THE ARMY OF THE UNITED STATES, JUNE 1898.

REGIMENTAL OFFICERS.	General.		Major-generals.		Brigadier-generals.		Colonels.		Lieutenant-colonels.		Majors.		Aides-de-camp.		Captains.		Adjutants (extra lieutenants).		Regimental quartermasters (extra lieutenants).		Battalion adjutant.		Battalion quartermaster.		First lieutenants.		Second lieutenants.		Additional second lieutenants.		Chaplains.		Military store-keepers.		Ordnance store-keepers.		Medical store-keepers.		Total.		Sergeant-majors.		Quartermaster-sergeants.		Ordnance sergeants.		Commissary-sergeants.		Post quartermaster-sergeants.		Hospital stewards.		Chief musicians.		Principal musicians.		Chief trumpeters.		Saddler sergeants.		First sergeants.		Sergeants.		Corporals.		Trumpeters.		Musicians.		Farriers and blacksmiths.		Artificers.		Saddlers.		Wagoners.		Privates, first class.		Privates, second class.		Privates.		General-service clerks, class 3.		General-service clerks, class 2.		General-service clerks, class 1.		General-service messengers.		Total.		Professors.		Cadets.		Aggregate.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Showing in detail the amounts expended from the various appropriations made for the Quartermaster's Department, etc.—Continued.

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REPORT OF THE SECRETARY OF WAR

QUARTERMASTER-GENERAL.

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Division and post.	CAVALRY AND ARTILLERY HORSES.				HOSPITALS.							
	Purchase of cavalry and artillery.	Advertising.	All expenses not otherwise enumerated.	Total amounts.	Extra duty.	Advertising.	Masons.	Laborers.	Other employes.	Construction and repairs.	All expenses not otherwise enumerated.	Total amounts.
<i>Department of the Missouri.</i>												
Headquarters and depot, Fort Leavenworth, Kans., and St. Louis, Mo.	\$3,250.00	\$128.91	\$390.00	\$3,768.91								
Fort Crawford, Colo.										\$3,305.00	\$7.50	\$3,305.00
Fort Riley, Kans.										225.00		225.00
Fort Reno, Ind. T.										100.40		100.40
Fort Supply, Ind. T.										306.47		306.47
Fort Sheridan, Ill.									\$16.00			16.00
Fort Sill, Ind. T.					\$28.12							28.12
Fort Elliott, Tex.										48.30		48.30
Fort Gibson, Ind. T.					120.06							120.06
Oklahoma City, Ind. T.					0.50					219.07	90.00	309.07
Guthrie, Ind. T.							\$95.00				5.00	95.00
Little Rock Barracks, Ark.										25.37		25.37
Total	3,250.00	128.91	390.00	3,768.91	163.68		65.00		16.00	5,163.16	102.50	5,510.34
<i>Department of the Platte.</i>												
Headquarters and depot, Omaha, Nebr.	4,125.87	295.04		4,420.91								
Fort McKinney, Wyo.										255.17		255.17
Fort Washakie, Wyo.										450.00		450.00
Fort Omaha, Nebr.										632.93		632.93
Fort Douglas, Utah.									30.00			30.00
Fort Laramie, Wyo.										138.10		138.10
Fort Sidney, Nebr.											6.00	6.00
Fort Niobrara, Nebr.										372.00		372.00
Total	4,125.87	295.04		4,420.91					36.00	2,375.00	6.90	2,418.50
<i>Department of Dakota.</i>												
Headquarters, St. Paul, Minn.	11,304.00	67.63	110.00	11,481.63								
Fort Casler, Mont.										77.00		77.00
Fort Meade, S. Dak.					5.00					74.80		79.80
Fort Missoula, Mont.										492.86		492.86
Total	11,304.00	67.63	110.00	11,481.63	5.00					8,310.75	69.80	8,370.05
<i>Department of Texas.</i>												
Fort Keogh, Mont.							91.50		354.00	404.05		404.05
Fort Buford, N. Dak.										597.50		597.50
Fort Yates, N. Dak.					28.00					117.00		145.00
Fort Assiniboine, Mont.										20.00		20.00
Fort Maginnis, Mont.										181.66		181.66
Fort Randall, S. Dak.										38.00		38.00
Fort Shaw, Mont.										72.00		72.00
Fort Pembina, N. Dak.										22.00		22.00
Fort Sully, S. Dak.										62.25		62.25
In the field										171.34		171.34
Total	11,304.00	67.63	110.00	11,481.63	33.00		91.50	4.00	1,569.61	4,695.31	59.30	6,452.72
<i>Department of California.</i>												
Headquarters and depot, San Antonio, Tex.	4,185.00	54.35		4,239.35								
Fort Davis, Tex.						\$22.50	122.50	68.00	239.00	2,460.11	80.00	2,992.11
Fort Hancock, Tex.					55.00							55.00
Fort McIntosh, Tex.					53.00							53.00
Fort Bliss, Tex.										407.70		407.70
Fort Ringgold, Tex.										550.00		550.00
Fort Clark, Tex.					19.50					994.00		994.00
Camp at Eagle Pass, Tex.					16.50					19.50		39.00
Camp Del Rio, Tex.										5.50		5.50
Total	4,185.00	54.35		4,239.35	144.00	22.50	122.50	68.00	239.00	4,436.61	80.00	5,112.81
<i>Department of California.</i>												
Headquarters and depot, San Francisco, Cal.	3,635.00	105.85	90.00	3,830.85								
Fort Mason, Cal.												
Presidio of San Francisco, Cal.												
Fort Gaston, Cal.										341.23		341.23
Fort Bidwell, Cal.						16.10				618.00		634.10
Bonita Barracks, Cal.									108.00	82.40		190.40
Alestraz Island, Cal.										11.70		11.70
Angel Island, Cal.	189.00			189.00	6.00	24.57				145.00		145.00
Total	3,824.00	105.85	90.00	4,019.85	6.00	40.67			108.00	3,454.19		3,484.76
<i>Department of Arizona.</i>												
Headquarters, Los Angeles, Cal.		23.15		23.15								
Santa Fe, N. Mex.												
Whipple Barracks, Ariz.										1,070.99		1,070.99
Fort Huachuca, Ariz.										100.00		100.00
Fort Wingate, N. Mex.										265.50		265.50
Fort Bayard, N. Mex.									60.00			60.00
Fort Selden, N. Mex.										454.00		454.00
Fort Stanton, N. Mex.					7.50					70.00		70.00
Total		23.15		23.15						550.00	72.33	622.33

During the year authorizations have also been made for construction of buildings at various military posts from the appropriations for transportation and regular supplies, as follows:

FROM THE APPROPRIATION FOR ARMY TRANSPORTATION.

Posts.	Designation.	Material.	Amount authorized.
Division of the Atlantic:			
Fort Hamilton	Building for water-closets and urinals	Brick	\$1,879.26
Newport, Ky.	Water-closets	do	569.00
Do	Water-closets for new barracks	do	1,522.00
Do	Water-closet and urinal in quartermaster's storehouse	do	221.00
Fort McPherson	Quarters for chief engineer	Brick	2,783.00
Do	Water-closets	do	494.12
Do	Pump-house	do	1,800.00
Total			9,289.38
Department of the Platte:			
Fort McKinney	Bath-house	Brick	3,536.47
Do	Wagon sheds	Frame	1,000.00
Total			4,536.47
Department of Dakota:			
Fort Buford	Bath-house	Frame	1,928.40
Fort Missoula	Dry-earth privy system	do	2,889.00
Fort Sully	Bath-house	do	985.83
Fort Yates	Wagon shed	do	500.00
Do	Bath-house	do	1,277.49
Total			7,068.88
Department of the Missouri:			
Fort Leavenworth	Screen water-closets	Brick	316.00
Do	Fire engine-house	do	1,000.00
Fort Crawford	Water-closets, etc.	Frame	990.68
Fort Riley	Water-closets	do	194.00
Do	Engineers' quarters	Brick	1,953.00
Total			5,264.68
Department of Texas:			
Fort McIntosh	Bath-house	Frame	1,740.00
Do	Pump and boiler house	Brick	1,530.00
Fort Kinggold	Three company one-houses with urinals, etc.	Frame	1,350.00
San Antonio	Two bath-houses and one sink	Frame and brick	1,468.10
Do	Garbage crematory	Brick	3,000.00
Fort Hancock	Wall for corral	do	5,387.00
Do	Pump-house	do	581.00
Total			15,054.11
Department of Arizona:			
Fort Huachuca	Wagon shed	Frame	845.05
Fort Yuma	Roof for new reservoir	Shingle	471.44
Do	Rebuilding four company bath and wash rooms	Frame	3,217.12
Fort Apache	Bath-house	Adobe	1,993.93
Total			6,503.49
Department of the Columbia:			
Fort Sherman	Bath-house	Frame	2,002.10
Fort Spokane	Water-closets, etc.	do	1,375.29
Do	Engine pump-house	do	1,368.65
Total			3,546.15
Independent posts, etc:			
White's Point	Water-closets	Brick	1,692.89
Day's Island	Temporary water-closets	Wood and brick	4,738.00
Do	Water-closet and urinal	Brick	3,000.45
Columbia Barracks	Garbage furnace	Brick	350.00
Total			10,052.34
Wagon sheds	Wagon shed	Frame	200.00
Total			61,436.41

QUARTERMASTER GENERAL.

FROM THE APPROPRIATION FOR REGULAR SUPPLIES.

Posts.	Designation.	Material.	Amount authorized.
Division of the Atlantic:			
Madison Barracks	Hay-scale protection	Frame	\$94.73
Do	Coal and wood sheds	do	445.74
Fort Sully	do	do	1,346.06
Fort McHenry	Shed protection for hay and coal scales	Brick	2,500.00
Jackson Barracks	do	Frame	251.53
Newport, Ky.	Boiler-house and steam-heating system	Wood	546.34
Fort McPherson	Oil-house	Brick	6,829.42
Fort Wood	Coal-shed	do	541.20
Total			397.00
Department of the Platte:			
Fort D. A. Russell	Coal-sheds, etc.	Frame	12,932.02
Fort Niobrara	Wood-sheds for officers' quarters	do	1,980.11
Fort Bridger	Coal-shed	do	155.48
Total			161.20
Department of Dakota:			
Fort Sully	Coal-shed	Frame	2,602.70
Fort Keogh	Coal-shed for officers' quarters	do	290.00
Total			385.00
Department of the Missouri:			
Fort Leavenworth	Coal-sheds	Frame	875.08
Fort Riley	Coal-shed	do	244.52
Fort Supply	Coal-shed	Stone and brick	6,977.75
Fort Logan	Oil-house	Frame	356.00
Total			5,407.74
Department of Arizona:			
Fort Marcy	Oil-house	Frame	12,985.01
Do	Granary	do	74.35
Do	Hay-shed	do	2,688.13
Fort Stanton	Wood, coal, and storage sheds	do	436.50
Fort Wingate	Three hay-sheds	do	241.53
Do	Coal and hay sheds	do	2,374.45
Fort Bowie	Grain-house	do	5,123.38
Do	Oil-house	do	2,504.29
Fort Huachuca	Hay-shed	Adobe and stone	298.00
Do	Oil-house	Frame	1,532.83
Fort Mojave	Hay-shed and oil-house	Frame	502.65
Whipple Barracks	Oil-house	Frame	217.22
Do	Hay-shed	Brick	879.00
Total			1,611.00
Department of the Columbia:			
Vancouver Barracks	Three wood-sheds	Frame	18,173.24
Boise Barracks	Coal-shed	do	2,093.55
Total			201.33
Independent posts, etc:			
White's Point	Coal-shed	Frame	2,894.88
Do	do	do	1,492.60
Total			350.00
Grand total			1,842.60
			52,302.60

REPORT OF THE SECRETARY OF WAR.

for the protection of trees and the grass from cattle, and general laboring work has been performed in the care of the reservation. Expenditures from the \$38,000 appropriation have been made as follows:

Cash expended.....	\$6,561.59
Outstanding on contracts.....	601.42
Authorized for the improvement of water supply.....	18,344.88
Total.....	25,507.89
Leaving a balance of.....	8,492.11

Expenditures authorized for wharves, roads, walks, grading, bridges, and various other expenditures, chargeable to the appropriation for Army transportation.

Post.	Roads, walks, grading, bridges.	Wharves.	Miscellaneous.
Fort Wayne, Mich.	\$241.00	\$1,515.00	\$674.00
Fort Brady, Mich.	50.00	50.00	50.00
Fort Mackinac, Mich.	342.50		437.50
Fort Niagara, N. Y.	381.00		
Fort Ontario, N. Y.	66.88	188.35	
Albion Barracks, N. Y.	100.00	180.00	
Plattsburgh Barracks, N. Y.	60.00		239.50
Fort Warren, Mass.	100.00		
Fort Adams, R. I.	800.00		
Fort Rumball, Conn.			977.75
Fisher's Island, Conn.	28.50		320.00
Fort Hamilton, N. Y.			233.50
Fort Vanderpoort, N. Y.	11,691.80		1,118.30
Fort Columbus, N. Y.	4,836.30		2,579.25
Governor's Island, New York Harbor.		233.00	1,910.00
Fort Schuyler, N. Y.	676.00	3,750.00	41.55
Fort McHenry, Md.	89.00		343.00
Washington Barracks, D. C.	5,195.00	500.00	293.00
Fort Mifflin, Pa.	690.00		65.00
Sk. Francis Barracks, Fla.			32.68
Mount Vernon Barracks, Ala.		300.30	1,772.45
Jackson Barracks, La.			611.30
New Post at Newport, Ky.			358.60
Fort Lecherson, Ga.	738.15	1,190.00	939.75
Fort Mifflin, Pa.	20,460.00		2,335.50
Fort Mifflin, Pa.	3,742.00		3,697.13
Fort Mifflin, Pa.			170.65
Fort Mifflin, Pa.			78.00
Fort Mifflin, Pa.			200.00
Fort Mifflin, Pa.			926.40
Fort Mifflin, Pa.	14.00		
Fort Mifflin, Pa.			2,150.00
Fort Mifflin, Pa.			20.00
Fort Mifflin, Pa.			968.88
Fort Mifflin, Pa.	244.70		1,777.49
Fort Mifflin, Pa.			4,533.47
Fort Mifflin, Pa.			670.63
Fort Mifflin, Pa.			7.00
Fort Mifflin, Pa.			80.00
Fort Mifflin, Pa.	1,500.00		6,050.00
Fort Mifflin, Pa.		6,000.00	176.35
Fort Mifflin, Pa.			3,082.79
Fort Mifflin, Pa.			990.68
Fort Mifflin, Pa.			6,735.60
Fort Mifflin, Pa.			194.00
Fort Mifflin, Pa.	10.00		13.80
Fort Mifflin, Pa.			3,104.00
Fort Mifflin, Pa.	6,467.28		1,468.10
Fort Mifflin, Pa.	1,180.60		3,674.62
Fort Mifflin, Pa.			3,217.12
Fort Mifflin, Pa.			10.65
Fort Mifflin, Pa.			1,040.00
Fort Mifflin, Pa.			113.69
Fort Mifflin, Pa.			845.75

QUARTERMASTER GENERAL.

Expenditures authorized for wharves, roads, walks, grading, bridges, etc.—Continued.

Post.	Roads, walks, grading, bridges.	Wharves.	Miscellaneous.
Fort Lowell, Ariz.	\$20.00		\$193.00
Whipple Barracks, Ariz.			17.00
Angel Island, Cal.	158.25	\$4,444.00	
Fort Bidwell, Cal.		20,630.65	444.85
Fort Mason, Cal.		387.00	825.00
Presidio of San Francisco	147.00		120.50
Los Angeles, Cal.			387.00
Fort Sherman, Idaho			2,567.70
Fort Spokane, Wash.			1,544.05
David's Island, N. Y.	138.00		2,000.00
Corbin Barracks, Ohio	4,270.30		8,133.01
Yates Point, N. Y.	5,230.45		750.00
Adler's Landing Depot, Ind.	501.00		
St. Louis Clothing Depot.	78.00		52.00
Misellaneous	4,000.00		253.00
Total.....	204,303.89	38,917.31	80,906.26

"For shelter and shooting galleries and ranges, and repairs thereof" Congress granted \$10,000 in the act making appropriation for support of the Army, March 2, 1889, which sum was appropriated in the following manner:

Station.	Designation.	Cost.	Station.	Designation.	Cost.
Division of the Artillery	Apportionment	\$1,630.79	Fort Snelling, Minn.	Rent of land	\$200.00
Department of Dakota	do	550.95	Division of the Artillery	Card-boards	5.40
Department of the Pacific	do	206.11	Fort Niagara	Hire two saddle horses	100.00
Department of the Missouri	do	379.47	Bois Barracks, La.	Flour and repairs	25.50
Department of Texas	do	196.54	Department of Dakota	144 camp stools	87.70
Department of the Columbia	do	146.37	Fort Wingate	Flour	1.14
Department of California	do	674.79	Fort Meade	Flour	7.00
Department of Arizona	do	287.98	Fort Du Chesse	Flour	72.54
Fort Sheridan	Rifle range	3,500.00	Fort Randall	Flour in part	33.95
Fort Ellipt	Repairs	2.00	Fort Sully	Pit house	179.91
Presidio, San Francisco	Repairs	80.52	Do	Reparments	16.21
Fort Adams, Mass.	do	72.05	Do	Skilled labor	17.50
Fisher's Island	do	500.00	Fort Albany	Flour	1.25
Omaha	do	60.00	Fort Arroyo	Repairs	48.45
Do	do	50.00	Fort Mackinac	Repairs to butt	86.60
Do	do	8.87	Fort Mackinac	Repairs	38.76
Do	do	13.85	Fort Sully	Flour	20.00
Omaha, Bellevue	Rent of grounds	600.00	Mount Vernon Barracks	Flour	25.87
Total.....		10,000.00	Total.....		2.24

HOSPITALS.

For construction and repair of hospitals, including the extra-duty pay of enlisted men employed on the same, Congress, in the Army appropriation act of March 2, 1889, provided \$100,000. This fund has been disbursed by officers of the Quartermaster's Department, on estimates approved by the Surgeon-General of the Army, as follows:

Department and post	Amount	Department and post	Amount
Division of the Atlantic:		Fort Riley	\$675.00
Fort Wayne	\$1,114.93	Fort Logan	7.60
Fort Porter	641.75	Oklahoma, Ind. T	124.65
Fort Ontario	90.40	Guadalupe, Ind. T	125.00
Madison Barracks	1,140.00	Total	23,020.14
Fort Preble	158.80	Department of Texas:	
Fort Warren	440.07	Fort Davis	1,030.00
Fort Adams	600.00	Fort Bliss	200.00
Fort Tumbull	710.60	Fort Ringgold	2,124.46
Fort Wadsworth	575.00	San Antonio	1,344.29
Fort McHenry	341.00	Camp Del Rio	140.00
Fort Monroe	234.90	Camp Hancock	95.39
Hot Springs	252.00	Camp Del Rio	97.20
Washington Barracks	1,339.37	Fort Bliss	550.00
Fort Hinton	10,430.30	Fort McIntosh	530.00
Fort Niagara	60.00	Fort Brown	2,500.00
Newport Barracks	121.58	Camp Eagle Pass	5.50
Jackson Barracks	10,365.92	Adventuring	22.50
Plaquemine Barracks	66.00	Total	8,630.94
Fort Myer	1,442.00	Department of Arizona:	
Mount Vernon Barracks	120.00	Fort Bayard	70.00
Fort Schuyler	700.00	Fort Selden	550.00
St. Francis Barracks	75.00	Fort Stanton	454.84
St. Francis Barracks	108.00	Fort Wingate	80.00
Fort Columbus	1,550.00	Fort Yuma	125.00
Total	34,382.23	Fort Apache	687.78
Department of Dakota:		Fort Grant	476.00
Fort Assiniboine	616.12	Fort Huachuca	209.52
Fort Buford	125.00	Fort Lowell	223.00
Fort Custer	900.00	Fort Yuma	350.00
Fort Keogh	34.73	Fort Stanton	164.27
Fort Argus	600.00	San Carlos	5,573.00
Fort Alamo	740.00	Total	9,304.20
Fort Alamo	480.00	Department of California:	
Fort Pembina	480.00	Alcatraz Island	3,689.57
Fort Randall	280.42	Angel Island	479.80
Fort Shaw	237.32	Bonita Barracks	575.00
Fort Snelling	120.00	Fort Bidwell	14.50
Fort Yates	187.71	Fort Gaston	250.00
Fort Sully	314.83	Fort Mason	288.23
Camp Sheridan	450.00	Presidio of San Francisco	634.10
Total	7,923.20	Total	5,781.20
Department of the Platte:		Department of the Columbia:	
Fort Bridger	59.35	Boise Barracks	80.00
Fort McKinney	450.00	Fort Spokane	100.00
Fort Atkinson	570.00	Fort Townsend	200.00
Fort Omaha	133.40	Vancouver Barracks	471.37
Fort Omaha	750.00	Fort Canby	295.70
Fort Vashaw	19.32	Fort Walls Walla	1,175.00
Fort Du Chesne	289.10	Total	2,322.07
Fort Douglas	372.00	Recruiting stations, etc.:	
Fort Sidney	372.00	Davison Barracks	525.00
Total	2,893.17	Davison Barracks	149.88
Department of the Missouri:		White's Point	90.00
the Rock Barracks	529.50	West Point	2,054.89
Sheridan	49.12	Total	2,819.77
Leavenworth	4,157.63	Grand total	100,000.00
Ellison	227.75		
Illio	150.00		
Illio	18,580.00		
Illio	550.00		
Illio	320.00		
Illio	300.00		
Illio	300.00		
Illio	18.40		

QUARTERMASTER-GENERAL.

Included in the foregoing are new hospital constructions at the following posts:

Fort Niagara, 12 bed brick	\$10,364.80	Fort Reno, 24 bed, wooden	\$18,000.00
San Carlos 8 bed adobe	5,573.00	Alcatraz Island, new ward, brick	5,500.00
Jackson Barracks, wooden	9,225.93	Fort Ringgold, isolation ward, etc.	1,770.04

None of these constructions were completed during the fiscal year.

HOSPITAL STEWARDS' QUARTERS.

An appropriation of \$12,500 was also made in the above-mentioned act for the construction of hospital stewards' quarters, including the extra-duty pay of enlisted men employed thereon.

This money has been apportioned by the Secretary of War to the posts named below under the provision of law "that the cost of construction of quarters at any one post shall in no case exceed \$800, except where a post is situated at a city of more than 50,000 inhabitants, the cost of construction of such quarters may be not to exceed \$1,200."

Station.	Amount	Station.	Amount
Fort Adams	\$708.00	Fort Meade	\$257.84
Fort Apache	75.00	Fort Monroe	9.00
Fort Baker	81.25	Mount Vernon Barracks	40.00
Berlin Barracks	875.00	Fort Myer	75.00
Boise Barracks	800.00	Fort Nibara	155.00
Fort Canby	105.50	Fort Pembina	44.73
Fort Clark	680.00	Presidio of San Francisco	63.00
Columbus Barracks	174.29	Fort Randall	16.04
Fort Custer	30.00	Fort Reno	75.00
Fort D. A. Russell	100.00	Fort Selden	24.85
David's Island	128.69	Fort Snelling	28.80
Fort Elliott	49.97	Fort Spokane	69.00
Fort Grant	124.88	Fort Sully	228.00
Fort Gibson	35.40	Fort Supply	89.49
Fort Hamilton	165.00	Fort Thos	175.00
Fort Hancock	124.80	Fort Tumbull	40.00
Fort Huachuca	85.00	Vancouver Barracks	7.45
Jackson Barracks	120.00	Fort Washakie	40.50
Fort Keogh	300.00	Washington Barracks	292.72
Fort Leavenworth	300.00	Fort Wayne	35.50
Fort Lowell	271.50	Fort Wingate	1,200.00
Fort McHenry	709.67	Fort Yates	320.00
Fort Nicholson	1,100.50	Total	12,500.00
Madison Barracks	145.00		
Fort Marcy	786.50		

BRIDGES.

During the year a steel bridge was constructed across the Kansas river at Fort Riley, Kans., to connect the two portions of the reservation separated thereby. It was built under contract from transportation funds, at a total cost of about \$15,454, which included the necessary approaches.

A new bridge over the Rio Puerco, on the road leading from Fort Wingate to Wingate Station, N. Mex., has also been built, at a cost of \$1,150.

At Fort Sheridan a bridge was authorized in connection with 3,000 yards of roadway, the contract price for the whole work being \$24,500, of which sum it is estimated that \$800 was necessary for the construction of the bridge. The work was not completed during the year.

WHARVES, ETC.

For the extension of the wharf at Fort Schuyler, New York Harbor, the Secretary of War authorized the expenditure of \$3,750, and work has been done at the contract price of \$2,795.

A.—Statement compiled from reports showing expenditures for repairs, etc.—Continued.

A.—Statement compiled from reports showing expenditures for repairs, etc.—Continued.

DIVISION OF THE PACIFIC—Continued.

DEPARTMENT OF ARIZONA—Continued.

Post.	Designation.	Amount.	Total.
San Diego Barracks, Cal.	Guard-house No. 3	\$63.86	
	Non-commissioned staff and married soldiers' quarters No. 4	358.61	
	Magazine No. 6	82.25	
	Wood-shed No. 8	15.20	
	Hay-house No. 10	175.68	
	Company barracks (adobe) No. 1	41.40	\$1,178.95
	Post and company commander's quarters (adobe) No. 3	27.00	
	Officers' quarters (adobe) No. 5	8.00	
	Headquarters, shops, and store-house (adobe) No. 6	65.80	
	Granary (adobe) No. 12	18.00	
Fort Apache, Ariz.	Officers' quarters (frame) No. 1	14.80	
	Commanding officers' quarters (frame) No. 3	3.00	
	Officers' quarters (frame) No. 5	3.00	
	Officers' quarters (frame) No. 6	4.00	
	Officers' quarters (frame) No. 7	4.00	
	Officers' quarters (frame) No. 8	4.00	
	Officers' quarters (frame) No. 9	4.00	
	Officers' quarters (frame) No. 10	4.00	
	Officers' quarters (frame) No. 16	5.00	
	Band barracks (adobe) No. 2	5.00	
Fort Huachuca, Ariz.	Troop barracks (frame) No. 2	28.69	
	Troop barracks (frame) No. 4	28.69	
	Troop barracks (frame) No. 5	26.72	
	Cavalry stables (frame) No. 1 C	26.69	
	Cavalry stables (frame) No. 2 C	26.69	
	Cavalry stables (frame) No. 3 C	32.58	
	Cavalry stables (frame) No. 4 C	32.58	
	Quartermaster's court (frame) No. 4 C	17.58	
	Post administration building (adobe) No. 1 B	67.16	
	Post guard-house (stone) No. 12	20.00	
Fort Huachuca, Ariz.	Post guard-house (stone) No. 6 B	10.00	
	Granary (frame) No. 13 B	6.00	
	Quartermaster's store-house (adobe) No. 17 B	131.65	
	Commissary store-house (adobe) No. 17 B	1,687.70	
	Saw-mill, steam-pump, etc. (stone) No. 18 B	2,937.01	
	Range, store-house (frame) No. 19 B	98.40	
	Range, store-house (frame) No. 20 B	56.00	
	Officers' quarters (adobe) No. 1	78.00	
	Officers' quarters (adobe) No. 2	84.00	
	Officers' quarters (adobe) No. 3	45.00	
Officers' quarters (adobe) No. 4	33.00		
Officers' quarters (adobe) No. 5	33.00		
Officers' quarters (adobe) No. 6	51.31		
Officers' quarters (adobe) No. 7	57.30		
Officers' quarters (adobe) No. 8	56.46		
Officers' quarters (adobe) No. 9	40.28		
Officers' quarters (adobe) No. 10	31.45		
Officers' quarters (adobe) No. 11	73.00		
Officers' quarters (adobe) No. 12	37.78		
Double barracks (adobe) No. 13	40.75		
Double barracks (adobe) No. 14	81.31		
Troop barracks (frame) No. 15	243.66		
Troop barracks (frame) No. 16	174.23		
Test headquarters, administration building, etc. (frame) No. 17	169.77		
Troop barracks (adobe) No. 18	121.46		
Quartermaster's store-house (adobe) No. 19	174.54		
Guard-house (adobe) No. 21	8.00		
Post bakery (adobe) No. 23	57.00		
Teamsters' mess (frame) No. 25	49.32		
Quartermaster's stables (frame) No. 26	23.29		
Cavalry stables (frame) No. 27	24.00		
Cavalry stables (frame) No. 28	27.00		
Cavalry stables (frame) No. 29	26.73		
Commissary store-house (adobe) No. 30	29.14		
Granary (adobe) No. 31	19.41		
Cavalry stables (frame) No. 33	15.00		
Cavalry stable (frame) No. 34	27.13		
Non-commissioned staff's quarters (adobe) No. 35	18.00		
	7.24		
	56.00		
	5,280.71		

Post.	Designation.	Amount.	Total.	
Fort Huachuca, Ariz.	Saw-mill (frame) No. 36	\$17.76		
	Non-commissioned staff's quarters (adobe) No. 37	14.00		
	Magazine (adobe) No. 39	609.00		
	Weapon-shed (frame) No. 40	583.44		
	Hay-shed (frame) No. 41	1,137.80		
	Cavalry and Infantry mess-room and kitchen Nos. 1 and 2	305.50	\$4,242.26	
	Flooding tent for post library No. 3	21.55		
	Officers' quarters No. 4	88.40		
	Cavalry and Infantry store tents No. 5	88.40		
	Guard-house (bull) No. 7	7,784.95		
San Carlos, Ariz.	Gun-shed (bull) No. 8	7,080.90		
	Gauvays store-houses (bull) Nos. 9 and 10	684.59		
	Officers' mess and kitchen (bull) No. 11	250.09		
	Infantry company mess and kitchen (bull) No. 12	230.65		
	Flooding and framing tauls Nos. 13 to 19 inclusive, \$38.15 each.	407.05		
	General repairs	148.00		
	Total Department of Arizona	10,260.45		
		72,405.86		
	* Built during the year.			
	RECAPITULATION.			
Department of the Columbia		\$24,463.23		
Department of California		26,471.45		
Department of Arizona		72,405.86		
Total Division of the Pacific		123,340.54		
RECRUITING STATIONS.				
Post.	Designation.	Amount.	Total.	
Davis Island, N. Y.	Officers' quarters No. 1	\$50.00		
	Officers' quarters No. 2	50.00		
	Officers' quarters No. 3	100.00		
	Officers' quarters No. 4	100.00		
	Officers' quarters No. 5	100.00		
	Officers' quarters No. 6	100.00		
	Army mess-hall and kitchen No. 24	100.00		
	Barracks No. 25	1,012.67		
	Post-office and officers' mess No. 45	842.21		
	Water-tower No. 50	147.00		
Johnson Barracks, Mo.	Coal-shed and wharf No. 57	63.00		
	Barracks No. 60	917.50		
		253.29		
	Officers' quarters No. 1	20.99		
	Officers' quarters No. 2	24.55		
	Commanding officers' quarters No. 3	39.49		
	Officers' quarters No. 4	16.95		
	Barracks No. 5	148.50		
	Barracks No. 6	104.26		
	Officers' quarters, No. 8	84.72		
Johnson Barracks, Mo.	Quartermaster's and commissary sergeants' offices and store-houses No. 9	81.36		
	Guard-house No. 10	43.35		
	Chanse No. 11	237.82		
	Water-tower No. 12	137.37		
	Stables No. 13	163.00		
	Post bakery No. 16	69.05		
	Lathes No. 34	17.41		
	Stables No. 25	4.32		
	Steam laundry No. 28	3.82		
	Quartermaster, sergeant's quarters No. 29	1,464.75		
Forge-master's quarters No. 30	2.52			
	2.55			
	\$2,623.67			

Texas, 19 miles from Miami, on the Southern Kansas Railroad. Reservation owned by the United States 2,560 acres, and 2,240 acres leased from State of Texas. Present garrison, 2 troops of cavalry and 1 company of infantry. Estimated capacity, of post 13 officers and 120 men. Recommended for abandonment.

*Engle Pass, Tex.*—Latitude 29° 42'; longitude 100° 30'. In Maverick County, part of old Fort Duncan Reservation, 62.94 acres, leased. Present garrison, 1 troop of cavalry. Accommodations for 8 officers and 40 men. (Estimated.)

*Ferry's Point, N. J.*—Latitude 39° 32'; longitude 75° 45'. On the Delaware River, 7 miles from Salem, N. J. Reservation, 104.35 acres. Not garrisoned.

*Foot's, Fort, Md.*—Latitude 38° 48'; longitude 77° 41'. On the Potomac River, 9 miles from Washington. Reservation, about 699 acres. Not garrisoned. In charge of ordnance sergeant.

*Gaines, Fort, Ala.*—Latitude 30° 15'; longitude 88° 4'. On Dauphin Island, Alabama, 30 miles from Mobile. Reservation, about 983.9 acres. Not garrisoned. In charge of ordnance sergeant.

*Gaston, Fort, Cal.*—Latitude 41° 4'; longitude 123° 37'. In Hoopa Valley, Humboldt County, 40 miles from Arcata and 324 miles from San Francisco. Reservation, 454 acres. Present garrison, 1 company of infantry. Accommodations for 4 officers and 38 men. Water supply from a mountain stream by iron pipes, distributed by gravity. Natural drainage. Post recommended for abandonment.

*Gibson, Fort, Ind.*—Latitude 35° 49'; longitude 95° 15'. On the east branch of Grand River, adjoining the town of Fort Gibson and 1 mile from station of the Kansas and Arkansas Valley Railroad. Reservation, 5,941 acres. Present garrison, 1 company of infantry. Accommodations for 7 officers and 50 men. Water supply hauled in water-wagons from Grand River. Cisterns at post. No sewer system, open drains.

*Goose Island, Wash.*—Latitude 48° 31'; longitude 122° 58'. In the Strait of San Juan de Fuca.

*Gorges, Fort, Me.*—Latitude 43° 39'; longitude 70° 13'. Hog Island, Portland Harbor, Maine, 2 miles from Portland. Reservation, about 14 acres. Not garrisoned. In charge of ordnance sergeant.

*Grant, Fort, Ariz.*—Latitude 33° 37'; longitude 109° 45'. In Pima County, 27 miles from Wilcox, on the Southern Pacific Railroad. Reservation, 42,341 acres. Present garrison, 3 troops of cavalry and 4 companies of infantry. Accommodations for 17 officers and 254 men. Water supply piped from reservoir fed by streams. Sewer system.

*Gravesold, Fort, Conn.*—Latitude 41° 22'; longitude 81° 8'. Groton Heights, 1 mile from New London. Reservation, 14 acres. Not garrisoned. In charge of ordnance sergeant.

*Hamilton, Fort, N. Y.*—Latitude 40° 37'; longitude 74° 1'. On shore of Long Island, 54 miles south of New York City, commanding the Narrows. Reservation, 98 acres. Present garrison, headquarters and 4 companies artillery. Reservation, 98 acres. 19 officers and 221 men. Two officers and 2 batteries and band quartered in casemates. Water supply from Brooklyn City water-works. Sewer system.

*Hancock, Fort, Tex.*—Latitude 31° 20'; longitude 105° 55'. Situated on the Rio Southern and Texas Pacific Railroad. Reservation, 469.2 acres. Present garrison, 1 company of infantry. Accommodations for 4 officers and 52 men. Water supply pumped from a well into settling tanks and distributed by iron pipes. Tlie drains leading to cesspools; no other sewerage.

*Hot Springs, Ark.*—Latitude 34° 31'; longitude 93°. Reserved by the President November 17, 1890. Area, 6,765 acres, being square or block No. 94 in subdivision of Hot Springs.

*Hutchinson, Fort, Ariz.*—Latitude 31° 33'; longitude 110° 16'. In Cochise County, 7 miles from Hutchinson Sliding on the New Mexico and Arizona Railroad. Reservation, 70 square miles. Present garrison, 4 troops cavalry and 2 companies infantry. Accommodations for 16 officers and 170 men. Water supply piped from springs 3 miles distant to distributing reservoirs. Sewer system.

*Independence, Fort, Mass.*—Latitude 42° 21'; longitude 71°. On Castle Island, Boston Harbor, 3 miles from Boston. Reservation, 12 acres. Not garrisoned.

*Jackson Barracks, La.*—Latitude 29° 57'; longitude 90°. On the east bank of the Mississippi River, 3 miles below the center of the city of New Orleans. Reservation, 87.87 acres. Present garrison, 1 company of infantry and 1 of artillery. Accommodations for 12 officers and 96 men. Four barracks buildings accommodate 24 men.

*La.*—Latitude 29° 21'; longitude 89° 26'. Seventy-three miles from Orleans. Reservation, 740.97 acres. Not garrisoned.

*son Barracks, Mo.*—Latitude 38° 38'; longitude 90° 17'. In South St. Louis, Mississippi River. Reservation, 1,379.06 acres, with 118.15 acres in adverse

possession by different parties. Recruiting depot. Accommodations for 11 officers and 440 men. Water supply from St. Louis water-works. Sewer system.

*McKenzie, Fort, Illa.*—Latitude 24° 38'; longitude 82° 52'. Garden Key, 71 miles from Key West. Reservation, 5 acres. Not garrisoned. In charge of ordnance sergeant.

*Johnston, Fort, N. C.*—Latitude 34°; longitude 78° 5'. Twenty-six miles from Wilmington. Reservation, 43,560 square feet. Not garrisoned.

*Koch, Fort, Mont.*—Latitude 46° 23'; longitude 105° 57'. On the Northern Pacific Railroad. Reservation, about 90 square miles. Present garrison, 3 troops cavalry and headquarters and 7 companies infantry. Accommodations for 27 officers and 280 men. Water supply pumped from a well near the Yellowstone River and distributed through iron pipes by direct pressure. Partial sewer system.

*Koy, Fort, Ark.*—Latitude 24° 33'; longitude 81° 48'. Reservation, 22.79 acres. Not garrisoned. In charge of ordnance sergeant.

*Knox, Fort, Me.*—Latitude 44° 34'; longitude 68° 48'. In Hancock County, 2 miles from Bucksport. Reservation, 150 acres. Not garrisoned. In charge of ordnance sergeant.

*La Grange, Fort, N. Y.*—Latitude 40° 37'; longitude 74° 2'. Six miles from Brook-lyn. Reservation, about 2 acres. Not garrisoned.

*Leavenworth, Fort, Kans.*—Latitude 39° 21'; longitude 94° 55'. On the Missouri River, above and adjoining Leavenworth City. Post reservation about 5,960 acres; timber reservation across the river of about 339 acres. Present garrison, 1 battery of artillery, 4 troops of cavalry, headquarters and 5 companies of infantry. Accommodations for 75 officers and 372 men. Water supply, Fort Leavenworth Water Company.

*Leaves, Fort, Colo.*—Latitude 37° 1'; longitude 108° 41'. On Rio de la Plata River, in La Plata County, 12 miles west of Durango, on the Denver and Rio Grande Railroad. Reservation, 47.4 square miles. Present garrison, 2 troops cavalry and 3 companies infantry. Accommodations for 21 officers and 452 men. Water supply raised from La Plata River by steam pump to reservoir and distributed by iron pipes. Surface drainage, except partial underground sewer system for hospital.

*Little Rock Barracks, Ark.*—Latitude 34° 43'; longitude 92° 10'. Within the limits of city of Little Rock. Reservation, 36.01 acres. Present garrison, 2 companies of infantry. Sewer system. Post recommended for abandonment.

*Livingston, Fort, La.*—Latitude 29° 15'; longitude 90°. On Grand Terre Island, 65 miles from New Orleans. Reservation, 610 acres. Not garrisoned. In charge of ordnance sergeant.

*Logan, Fort, Colo.*—Latitude 39° 40'; longitude 105° 1'. On Bear Creek, 74 miles south of Denver. Reservation, 640 acres. Present garrison, headquarters and 6 companies of infantry. Accommodations for 24 officers and 348 men (when all buildings under construction are completed). Water supply pumped from an artesian well to a reservoir and distributed through iron pipes. Sewer system.

*Lowell, Fort, Ariz.*—Latitude 32° 17'; longitude 110° 48'. On Rillito Creek, 7 miles from Tucson on Southern Pacific Railroad. Reservation, 51,631.36 acres. Present garrison, headquarters and 3 troops of cavalry. Accommodations for 8 officers and 102 men. One barrack building used as post canteen; if used as quarters will accommodate 12 men. Water raised by steam-pump from well to a distributing reservoir. Sewer system.

*McPherson, Fort, Ga.*—Latitude 33° 48'; longitude 84° 31'. Situated south of and 4 miles from the center of the city of Atlanta. Reservation, 236.41 acres. Present garrison, headquarters and 4 batteries artillery. Accommodations for 14 officers and 191 men; additional quarters for officers and men under construction. Water supply pumped from artesian well to elevated tank and distributed by system of iron pipes. New well being sunk to increase supply. Sewer system.

*Macinae, Fort, Mich.*—Latitude 45° 51'; longitude 84° 41'. On Mackinac Island in the Straits of Mackinac, overlooking the village of Mackinac. Military reservation proper, 103.41 acres. National park under the immediate control of the military authorities, 821 acres. Present garrison, 2 companies infantry. Accommodations for 7 officers and 134 men. Water supply pumped from springs to reservoir and distributed by iron pipes. Sewer system.

*Madison, Fort, La.*—Latitude 30° 5'; longitude 89° 51'. One and one-half miles from Chef Menteur. Reservation, 1,364.71 acres. Not garrisoned. In charge of ordnance sergeant.

*Macon, Fort, N. C.*—Latitude 30° 41'; longitude 76° 40'. Two miles from Morehead City. Reservation, 14 square miles. Not garrisoned. In charge of ordnance sergeant.

*Madison Barracks, N. Y.*—Latitude 43° 57'; longitude 76° 15'. On the south shore of Black River Bay, about 10 miles from Lake Ontario, at the town of Sackett's Harbor. Reservation, 394 acres. Present garrison, headquarters and 3 companies

enfilade water. Without the second trap it would be a short hopper-closet, and equally good, provided the flush is efficient. This has the advantage of having no mechanical obstacle, except the water itself, to the escape of the waste matter. The rim-flush, by which the water enters the bowl at all points of the upper circumference, is the best mode of supply, and, for the sake of cleanliness, should be used in any style of closet.

"Notwithstanding the Casenda is much better than the Demarest, for pecuniary reasons it does not seem advisable to replace the latter as long as they remain in good working order and the water flows copiously in sudden flushes. But this cannot be done with the one-half-inch pipe and the single point of entrance. While this combination is in use great pains must be taken to avoid accumulations in and above the trap. It will be seen that I think the tanks, as at present set up, undesirable. Of course it is understood that the use of the trap with the water-seal is to be important to guard against the introduction of this contaminated air, commonly called 'sewer-gas,' by any other channel. Therefore all traps for bath-tubs and wash-sinks, as well as of water-closets, should be as near the fixtures as possible, so that the polluted section of pipe may be no longer than necessary; for all waste-pipes carry animal matter that will decompose. To introduce a bath-tub pipe into the lower part of a soil-pipe seal (as in quarters 12 and 19) with a view of using that seal as a trap is unwise, because a deposit will sometimes remain in the bend of the trap, and may regurgitate through the smaller pipe. To insure the best results, to facilitate the flow; should not be as direct and with as great a fall as possible, flushed; should be absolutely impertuous both in material and joints, so that no gas may escape; all waste-pipes from basins, wash-sinks, bath-tubs, etc., should be as thoroughly ventilated. Putty and cement joints, wherever found, are mischievous. They do not serve the purpose for which joints are designed, that of keeping the whole line of pipe gas-tight. As an example of special defect, attention is invited to quarters 12 and 13, where there are unnecessary changes of direction in the soil-pipe such a point as to be liable to conduct foul air upwards after the trap has been flushed. This latter defect exists in quarters No. 19 also. In quarters 11 (commanding office) it is a mistake to run a ventilating pipe into the kitchen chimney. This was formerly considered advisable, and I think I once said as much to the commanding officer, but it is now recognized as unwise. The pipe is liable to be clogged with snow, and an upward current in the chimney can not always be depended upon. When the current is reversed the house will suffer. The supply-pipe to the closets in the yards of 56 and 57, west end, is not of sufficient caliber to do the work properly. The company sinks and urinals, though not so attractive as fashions, may receive attention in the hospital estimates, but it is desired that the detached tanks be closed.

"There is no evidence that sickness has resulted from the plumbing as it now exists, but as serious errors have been found in the examination already made, I beg for consideration the propriety of a house-to-house inspection by the medical officer and the quartermaster, if his other duties will permit him, with the assistance of a record plumber, or by such other competent detail as may be preferred, to the end that a record may be made of the state of the plumbing in each house, and that estimates there are available funds on hand, I recommend that the required changes already indicated be made now, and those yet to be pointed out to follow as soon as possible.

"The removal of all wooden or other walls about the fixtures that form dark closets and receptacles for dust can be done without expenditure, and is a first step towards exposing uncleanness and to leading to vigilance in the care of traps, and should be done.

#### DRAINAGE, SEWERAGE, ETC.

At many of the posts that have been occupied for years the want of satisfactory methods of disposing of excreta, garbage, and waste-water as led to conditions that must of necessity exercise a harmful influence on the health of the troops. The privy-pits at Fort Omaha have been filled up so often that the soil is everywhere saturated and the bad air so foul as to be a cause of complaint. No municipal gov-

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ernment would tolerate the nuisances that exist at this post. At Fort D. A. Russell also the continued use of privy-pits and cesspools has rendered the ground impure. Improvements, however, continue to be made. The post of San Diego is now connected with the sewerage system of the neighboring city. Estimates have been made for sewers at Fort Bliss. A system was made at Fort Huachuca, but an account of frequent obstructions of the main sewer the connections have been removed and the use of privy-boxes resumed. The system in exception was taken to the location of grease-traps inside the buildings. Dry-earth boxes have been substituted at many posts for the primitive vault. Reports against their use come from two posts, Fort Gibson and Assiniboine; at the one, the cause of the failure of the system was merely the trouble in procuring the earth; at the other, the difficulties attending removal. Wooden boxes are objectionable on account of the impossibility of keeping them clean. The medical officers at some posts, as Forts Sidney, Apache, Davis, and Clark, urge the use of pails of galvanized iron. These pails have been in use at Fort Hancock for several years and have answered their purpose admirably. There is no soiling of the surroundings, as they fit snugly, do not leak, and can always be handled with facility, as there is no absorption system supplied with these pails during the past year. Fort Kingold high level of the subsoil-water, the privy-pits are always flooded. Missoula obtained new earth-closets during the year. The dry-earth vision for the removal of its waste-water is needed. The medical officer at Fort A. Lincoln recommended the introduction of earth-closets or sewerage, but this was not considered advisable on account of the probable abandonment of the post. A call was made for earth-closets by the post surgeon at Fort Washakie on account of the accumulation of earth-closets close of the year was anticipated in the vicinity of the post. Fort Yates at the removal in place of its privy-pits. Earth-boxes were introduced at the Mary and were considered a great improvement on the system at Fort post the medical officer took exception to the construction of earth-closets in the officers' quarters, as there was no outlet for the water except into cesspools. The Quartermaster's Department ultimately decided the use of the dry-earth system instead of water-closets, and provided leaching cesspools for the disposal of water-closets, and provided an officer at Fort Gaston condemned the use of cesspools at his post. The medical officer at Fort Gaston condemned the use of cesspools at his post. An odorless excavator in use at Fort Niobrara for emptying the cesspools is said to answer its purpose admirably. Facilities for the disposal of excreta are defective even at some of the oldest posts: Certain vaults at Fort Adams are reported as leaking into the basements of occupied quarters; at Fort Hamilton the bar as a water-closet seat is considered to be somewhat behind the times; and at West Point the sinks in rear of the band barracks, and of the various detachments of cavalry, artillery, and engineers are all in bad sanitary condition, and from insufficient police, but on account of the character of the soil, and the inefficiency of water available for flushing.

Fort Omaha, Nebraska—Major A. Eastman: "As there never has been any sewerage, and almost no surface drainage, the soil everywhere is saturated with the contents of old privy-vaults, and the atmosphere laden with odors from the same. A portion of many of the buildings rests directly on the ground, many of the contents of earth odors; no basements, no area walls.

around passes up through the buildings as through flues. The privy-vaults generally are in near and dangerous proximity to the cisterns, and owing to the peculiar construction of the post, the natural drainage from the vaults is, in the officers' quarters, under the quarters and into their front yards. The complaint of foul odors prevails generally."

FORT D. A. RUSSELL, WYO.—*Capt. D. M. Appel*: "The drainage of the post is very defective. A very small part of the post is drained by sewer, which is, however, not connected with any of the barracks nor the majority of the quarters of officers or enlisted men; in the latter the old cesspool and privy are still in use, a constant menace to the health of the garrison and breeding-ground for epidemic diseases. In as large a command as this a proper system of drainage is an urgent necessity, as being of the greatest sanitary importance."

FORT HUACHUCA, ARIZ.—*Major J. H. Patzki*: "The drainage is good; the sewerage system, as far as relates to troop-closets, is still unsatisfactory. Owing to the small diameter of the main sewer it is constantly becoming obstructed by the material used by the enlisted men. Most of the connections have been removed and the old system of boxes substituted. The fecal matter accumulated during five years in the vaults in the officers' yards still remains, as the estimate for its removal was considered excessive and disapproved by the Quartermaster-General."

FORT MACKINAC, MICH.—*Lieut. Charles E. Woodruff*: "The new drainage system which has just been completed is a very excellent one, and will be found to fulfill sanitary requirements except in one particular. \* \* \* The first principle and foundation of all sanitary plumbing is to remove immediately from dwellings all waste-water and excreta; this is the object for which modern plumbing has been evolved, and yet it is violated by the miserable contrivances called grease-traps. These traps, which are inserted in each house, hold about two buckets of the filthiest water imaginable, \* \* \* giving forth the most foul odors, even if the traps were cleaned every few days. \* \* \* I would strongly recommend removing them all and substituting a simple lead 'S' ventilated trap."

*The commanding officer of the post*: "Grease-traps \* \* \* have been in use but from ten to fifteen days; it seems early to condemn them. \* \* \* They are so constructed that they act as gas-traps as well as grease-traps. \* \* \* It seems probable that the sewers must soon be ruined if all the grease now retained in twenty grease-traps is allowed to pass into them."

*The medical director*: "Grease-traps are necessary adjuncts to good house and kitchen drainage. Of course they should be properly constructed, and placed under the care of a special individual to look after and keep them in order at least once a week. If neglected they become a source of annoyance and possible menace to the health of all interested. There are several varieties of grease-traps that are put up by the plumbers. It would be better to have traps of this kind located outside the quarters and inclosed in a brick vault with an iron case; the iron of the trap prevents any leak into the brickwork while the latter protects the trap from the frost and renders it readily accessible."

FORT GIBSON, IND. T.—*Capt. W. D. Owen, jr.*: "I would call attention to the condition of the out-houses back of the officers' quarters; in fact the same remarks apply to all those in the post. They are rotten at base, and tumble-down; the privies are supposed to be earth-closets, but earth is never used, there being no means to prepare it."

FORT ASSINIBOINE, MONT.—*Capt. L. A. La Garde*: "The earth-closets in use at the present time will have to give way to more commodious arrangements. As conducted at present the dry-earth system is a failure. It is utterly impossible to remove the fecal matter during the extreme cold of this latitude without contaminating the surrounding soil. To conduct the system properly it is necessary to be prepared. (1) The urine and feces should be voided in separate vessels. (2) The temperature of the room should not go below freezing. (3) The vessels referred to should be entirely within the room. (4) The scavenger should enter the closet and empty the vessels in his cart at the door. As it is now, he goes to the rear of the closet, pulls the box, and in winter he chips the mass as best he can, empties what is possible in his cart, drops part on the ground, and the rest remains frozen in the bottom. The exciting cause of typhoid fever is in this post, as the epidemic of last fall has shown; and since the favorite habitat of the cause—doubtless a germ—is in 'cesspools, sewers, drains, wet manured soil and dung heaps,' it behooves us to be especially careful in disposing of our refuse. For that reason the present arrangement should be abolished at once and the perfected system, as indicated above, should be practiced instead. The latter is at present in use in my quarters, and although on a comparatively small scale, yet I am satisfied that with care and daily inspection, it could be conducted as satisfactorily for a company as it can be for a private family."

*The general commanding the department*, in his indorsement, remarks: "The earth-closets at Fort Assiniboine can be improved, and will be, but it will hardly be practicable in that cold place to keep them at such a temperature as to prevent at all times any freezing, neither does it seem essential to a good sanitary condition."