proper amount for exposure add 40 per cent and refer to Tables 18–24 to find the proper size radiator.

Example.—The heat losses including allowance for exposure for a given size room is 17,200 B.t.u. + 40 per cent or 24,080 B.t.u., requiring a 19-section 45 in. 3-col. semi-indirect radiator.

Pipe coils should be of the header type, with provision made for expansion by a mitre piece. The steam supply should be at the mitre end and all coils should be securely anchored at the return header so as to throw the expansion toward the mitre end. The coils should be made of 1¼ or 1½ in. pipe and not over 60 ft. in length, not including the mitre, which should be at least one-tenth the length of the coil.

SELECTION OF RADIATION

It is usually necessary to select the type and location of radiation to conform to the conditions and space available in the room. In general it is usually most convenient and practical to locate the radiation on the exposed side of the room. The size of the radiator to take care of any particular heat loss can be best selected from the sheets compiled by the Society's Research Laboratory in cooperation with the U. S. Bureau of Mines Experiment Station, which are based on experiments by the late Director John R. Allen, and F. B. Rowley. As the heat emitted per square foot of radiation varies in radiators of different heights, widths and lengths, and also with the steam pressure and the temperature of the room, errors will occur if the same factor is used for all radiators.

Examples for the Use of Tables.—Assume that the heat loss from a room is 15,497 B.t.u. per hr., to heat the room to 70 deg. fahr. Two-column 38-in. radiators have been selected using steam at 1-lb. gage or approximately 215 deg. fahr.

Solution.—In Table 19 for two-column radiators, under 38 in., it will be found that a 17-section radiator will emit 15,960 B.t.u. Therefore a 17-section two-column 38-in. radiator will be required with a rated surface of 68 sq. ft.

If in the same example steam at 5-lb. pressure or approximately 227 deg. fahr. was used and the room was heated to only 60 deg. fahr. requiring 13,300 B.t.u. and three-column 26-in. radiators are selected the radiation would be estimated as follows:

Solution.—In Table 25 following down the first column to 5-lb. gage pressure and then over horizontally to 60 deg. fahr. room temperature the conversion factor 0.864 will be found. The heat loss 13,300 × 0.864 (the equivalent heat loss) = 11,480 B.t.u. In Table 20 for three-column radiators under the heading 26 in. it will be found that a 13-section radiator will supply 11,242 B.t.u. under standard conditions which is the closest to the amount required. Therefore a 13-section three-column 26-in. radiator will be required.

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Result of Cooperative Work With U. S. Bureau of Mines Experiment Station, Pittsburgh, Pa.
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TABLE 18. HEAT EMITTED BY DIRECT RADIATION—SINGLE-COLUMN RADIATORS

Steam Temperature at 215 deg. fahr. *Room Temperature at 70 deg. fahr.*

LENGTH INCHES	No. OF SECTIONS	38 IN.		32 IN.		28 IN.		23 IN.		20 IN.	
		Rated Surface sq. ft.	Total B.t.u. per hr.	Rated Surface sq. ft.	Total B.t.u. per hr.	Rated Surface sq. ft.	Total B.t.u. per hr.	Rated Surface sq. ft.	Total B.t.u. per hr.	Rated Surface sq. ft.	Total B.t.u. per hr.
	1	3	1125	2.5	952	2	770	1.66	654	1.5	593
5	2	6	1849	5.0	1589	4	1293	3.33	1112	3.0	982
	3	9	2578	7.5	2217	6	1807	5.00	1555	4.5	1377
10	4	12	3307	10.0	2845	8	2321	6.66	1997	6.0	1772
	5	15	4035	12.5	3471	10	2835	8.33	2440	7.5	2168
15	6	18	4765	15.0	4098	12	3348	10.00	2882	9.0	2562
	7	21	5494	17.5	4725	14	3863	11.66	3324	10.5	2957
20	8	24	6223	20 0	5354	16	4377	13.33	3767	12.0	3353
	9	27	6950	22.5	5982	18	4891	15.00	4209	13.5	3748
25	10	30	7680	25.0	6610	20	5404	16.66	4652	15.0	4143
	11	33	8408	27.5	7236	22	5918	18.33	5095	16.5	4538
30	12	36	9137	30.0	7863	24	6432	20.00	5538	18.0	4932
	13	39	9867	32.5	8489	26	6947	21.66	5980	19.5	5327
35	14	42	10594	35.0	9117	28	7459	23.33	6422	21.0	5723
	15	45	11322	37.5	9744	30	7974	25.00	6865	22.5	6118
	16	48	12053	40.0	10372	32	8489	26.66	7309	24.0	6514
40	17	51	12781	42.5	10999	34	9000	28.33	7752	25.5	6908
	18	54	13511	45.0	11624	36	9515	30.00	8193	27.0	7304
45	19	57	14239	47.5	12250	38	10028	31.66	8635	28.5	7698
50	20	60	14964	50.0	12875	40	10544	33.33	9080	30.0	8094
B.t.u. per Intermed. Section			728	....	626	..	514	.....	443	....	395
" " Sq. Ft. "			243	....	250	..	257	.....	266	....	263
" " End Surface			375	....	380	..	385	.....	394	....	395