

The effects of painting a six-section 32-in. three-column conductor as found in recent tests are given in Table 2.

Effect of Type and Height

The results of tests (Fig. 2)¹, conducted at the University of Illinois with two types of radiators, lead to the following conclusions:

1. The heating effect of a radiator cannot be judged solely on the amount of steam condensed within the radiator.

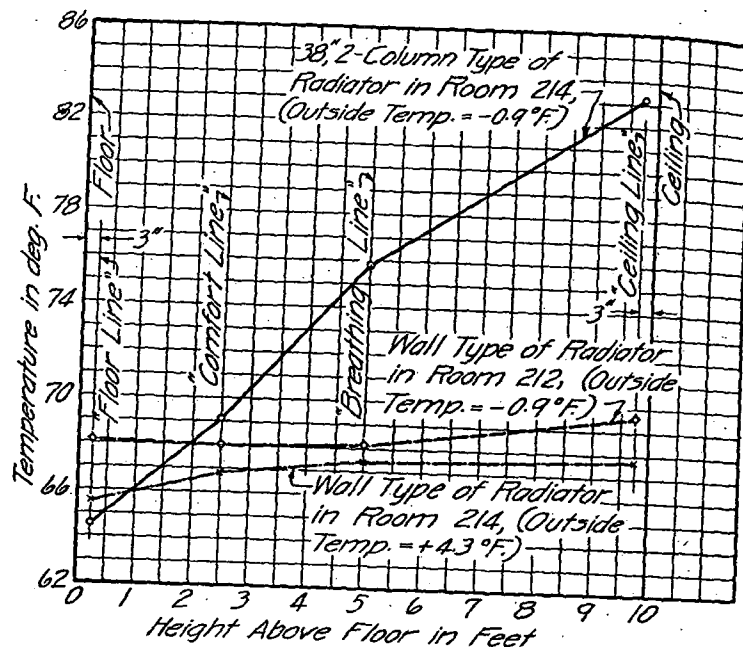


FIG. 2. AIR TEMPERATURE GRADIENTS^a FROM FLOOR TO CEILING FOR COLUMN AND WALL-TYPE RADIATORS

^aNote that all three radiators maintained about the same temperature at the Comfort Line.

2. High column radiators placed at the sides of window openings do not produce as comfortable heating effects as long, low, direct radiators placed beneath a window opening.
3. Smaller floor to ceiling temperature differentials can be maintained with long, low, direct radiators, than is possible with high, direct, column radiators.
4. High column and tubular types of direct radiators give the major portion of the floor to ceiling temperature differential above the breathing line level.
5. The comfort level (approximately 2 ft-6 in. above floor) is below the breathing line level (approximately 5 ft-0 in. above floor), and temperatures taken at the breathing line may not be indicative of the actual heating effect of a radiator in the room. The comfort indicating temperature should be taken below the breathing line level.

¹The Effect of Two Types of Cast-Iron Steam Radiators in Room Heating, by Prof. A. C. Willard and M. K. Fahnestock, Heating, Piping and Air Conditioning, March, 1930.

Effect of Enclosures

The general effect of an enclosure placed about a radiator is to decrease the amount of steam that the radiator will condense per hour and thus to reduce the amount of heat given off by the radiator. The results of recent investigations² indicate that only where the enclosure is made much higher than the heater, thereby producing a chimney effect, is the condensation rate equal to or greater than that of an identical radiator unenclosed. The heating effect of a given radiator is not always impaired by the use of an enclosure producing a reduction in the amount of steam condensed per hour.

The effects produced by an enclosure are dependent upon its design, so that the following results may be produced:

1. Better distribution of the heat below the breathing line level to produce greater heating comfort and lowered ceiling temperatures.

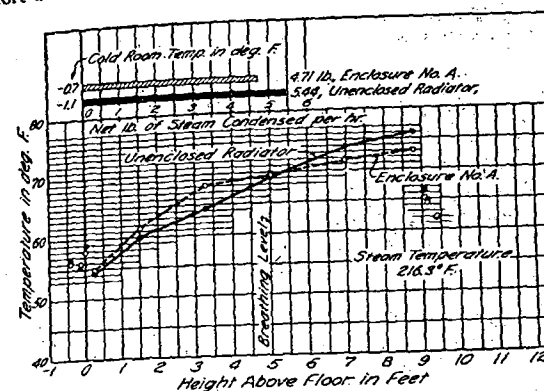


FIG. 3. ROOM TEMPERATURE GRADIENT AND STEAM CONDENSING RATE FOR RADIATOR WITH WELL DESIGNED ENCLOSURE

2. The lessened steam consumption may not materially change the radiator heating performance.
3. The enclosed radiator may inadequately heat the space.

The heating effects³ of bare radiators, and radiators fitted with a well designed enclosure, a poorly designed enclosure, a well designed shield, and a cloth cover, are shown by Figs. 3, 4, 5 and 6.

Fig. 3 illustrates the relative heating effects of a bare radiator and the effects produced with the radiator fitted with a well designed enclosure. Comparison of the curves reveals that the enclosed radiator used 13 per cent less steam than the bare radiator, gave the same breathing line temperature, produced higher temperatures in the occupied zone, and gave reduced temperatures above the breathing level. This was a satisfactory heating performance. Fig. 4 shows the unsatisfactory effects produced by

²Effect of Enclosures on Radiator Performance, by A. P. Kratz and M. K. Fahnestock (A.S.H.V.E. TRANSACTIONS, Vol. 33, 1927).

³Investigation of Heating Rooms with Direct Steam Radiators Equipped with Enclosures and Shields, by A. C. Willard, A. P. Kratz, M. K. Fahnestock and S. Konzo (A.S.H.V.E. TRANSACTIONS, Vol. 35, 1929).