oped for determining the amount of the sensible and insensible perspiration and great degrees of accuracy have been attained; but all these are too cumbersome for routine clinical use.

With the idea of simplicity in method and equipment in mind, we have devised the following technique for the estimation of sweat output in terms of time with sufficient accuracy for use by the clinician. It must of course be considered an empirical method because the chemistry of the various hydrates of cobaltous chloride is extremely complex and still under study. The determinations by this method can not thus be considered precisely quantitative, but they do give a fairly accurate index of the amount of secretion.

PRINCIPLE

Cobaltous chloride is a salt of blue color in its anhydrous state, but which turns distinctly pink after taking up six molecules of water of crystallization. There are intermediate hydrates formed, containing less than six molecules of water, but none of these are of a pure pink color. The hydrates of cobaltous chloride readily give up all their water on heating to 140° C., forming the blue anhydrous salt. The color change may be graphically expressed by the following equation:

$$\underset{\text{(blue)}}{CoCl_2} + 6\,H_2O \rightleftarrows \underset{\text{(pink)}}{CoCl_2 \cdot 6\,H_2O}$$

METHOD

A special bibulous sheet is treated by immersion in a standard 10 per cent. solution of cobaltous chloride, allowed to dry and then cut into strips of suitable size for use. Any good grade of fine-grained perfectly white filter paper may be substituted. Just before use, the strips of this treated paper are thoroughly dried in an oven at 140° C. and then placed upon the area of skin to be studied and immediately pressed to the surface by an ordinary glass diascope. The time required for a complete change in color from blue to a pure pink is observed and recorded. Since the paper contains a standard concentration of anhydrous $CoCl_2$ when blue, and since it requires a definite amount of water to completely change this into the pink hydrate $CoCl_2.6\,H_2O$, the time observed for the color change corresponds to the time required by the sweat glands of the area under study to secrete this amount of water.

APPLICATION

Up to the present we have employed this method to determine relative changes in, rather than absolute amounts of, sweat secretion. Several patients under treatment with x-ray for a dermatosis associated with excessively sweaty palms were followed by this test to determine its practicability in measuring the progressive decrease of sweat secretion under roentgen irradiation. In Table 1 is a typical set of readings obtained at weekly intervals.

TABLE 1

	Initial reading	Irradiation	Second reading	Irradiation	Third reading
Right hypothenar eminence ..	1 min.	125r	2 min. 30 sec.	125r	4 min. 30 sec.
Left hypothenar eminence ..	1 min.		2 min. 45 sec.		4 min.

On several subjects with normal skins the test was used to measure the increase in sweating of the palms produced by the nervous effort of mental arithmetic. Determinations were first made with the subject at rest and immediately afterward repeated while the subject was given multiplication problems to solve mentally. The readings showed clearly the expected very definite increase in sweat output, by the diminution of the time required for the color change from blue to pink. Some actual figures obtained are given in Table 2.

TABLE 2

Subject	At rest	Doing mental arithemetic
A	9½ min.	4½ min.
B	10 min.	3 min.
C	10 min.	6½ min.

This method of measurement is in process of calibration, so to speak, by making simultaneous quantitative determinations by means of one of the older methods. But even without determining the absolute value of the sweat output the test has a definite practical clinical value in observing and recording the relative changes in local sweat output under treatment; or the increase or decrease of sweat due to nerve injuries; or the study of the influence of temperature, muscular exercise, emotions, mental effort, etc., on the sweat output of various portions of the skin surface.

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