$$r_{n_i, x_i} = \sqrt{\frac{s - i + 1}{si}}, \tag{15}$$

$$r_{n_{i+1}, n_i} = \sqrt{\frac{i(s - i)}{(i + 1)(s - i + 1)}}. \tag{16}$$

Example 3. The cards of a deck are turned one by one until two aces have appeared. The second ace appears when the 36th card is turned. How many more cards should one expect to have to turn to find a third ace?

Solution. Here $m = 52$, $s = 4$, $i = 2$, $n_2 = 36$.

Then $\bar{n}_2 = 2 \cdot \frac{53}{5}$, $\bar{x}_3 = \frac{53}{5}$, and $r_{n_2, x_3} = -\sqrt{\frac{2}{4(4 - 2 + 1)}} = -\frac{\sqrt{6}}{6}$. Also $\sigma_{x_3} = \sqrt{4d}$ and $\sigma_{n_2} = \sqrt{6d}$. Since $\frac{x_3 - \bar{x}_3}{\sigma_{x_3}} = r_{n_2, x_3} \frac{(n_2 - \bar{n}_2)}{\sigma_{n_2}}$, we have

$$x_3 = \frac{53}{5} - \frac{2}{\sqrt{6}} \cdot \frac{\sqrt{6}}{6}\left(36 - \frac{106}{5}\right) = \frac{17}{3}.$$

Of course this result could have been obtained more directly by noting that there were two aces left among the 16 remaining cards.

Conclusion. The results given in this note might be useful when it is necessary to estimate the number of items to be drawn in order to secure a desired number of a particular type, such as may be the case in obtaining a sample with previously defined characteristics. Also the note disproves such intuitive notions as the one that when looking for a desired record, one is most likely to have to search the whole pile to find it. As far as methods of sampling inspection are concerned, the one implied in this note has little to recommend it.

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RANK CORRELATION WHEN THERE ARE EQUAL VARIATES[1]

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If there is given a set of number pairs

$$(X_1, Y_1), (X_2, Y_2), \cdots, (X_N, Y_N), \tag{1}$$

we may assign to each variate its "rank" (i.e. one more than the number of corresponding variates in the set greater than the given variate). In this way there is obtained a set of pairs of ranks

$$(x_1, y_1), (x_2, y_2), \cdots, (x_N, y_N). \tag{2}$$

[1] Presented at the fall meeting, Mich. section of the Math. Assn. of America, Nov. 18, 1939, Kalamazoo College.