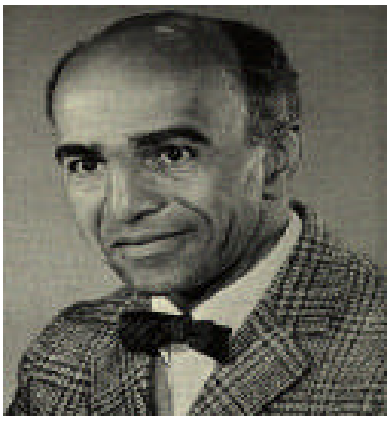
David Blackwell



David Blackwell is an African American mathematician. He grew up in Centralia Illinois but was fortunate enough to attend a mixed school while he was growing up. Blackwell attended the University of Illinois where he received both his doctorate in Mathematics. Blackwell was appointed a Postdoctoral Fellow at the Institute for Advanced Study making him a visiting fellow of Princeton University. Blackwell only lasted a year before the president of Princeton did not welcome him back. Blackwell then assuming that no white school would hire him, he applied to 105 Black schools in the country. After teaching at several schools he was able to settle down at Stanford University. During his professional career he wrote over 50 papers and two book. Blackwell has earned many honors such as being the first and only African American to be a member of the National Academy of Sciences; he was also the President of the American Statistical Society, Vice President of the American Mathematics Society, and in 1979 won the van Neumann Theory Prize. Blackwell overcame the prejudices of society to become one of the most well known mathematicians of today.

In class we discussed Blackwell's game theory developed in his paper "The Big Match". In this paper Blackwell talks of a game where player 1 and player 2 are picking either 0 or1 and player 1 is trying to guess what player 2 will choose. In making his decision he must first play a little and record his winnings. The next step is to analyze his winnings and find the probability of what his next choice should be for him to win the most. This example is one way to use probability. Probability is the study of randomness. Something is random if it is not predictable or cannot be determine with a certainty. Look at the following problems and follow the following formula to find the probability of each situation.

$$P(E) = \frac{n(E)}{n(S)},$$

where n(E) is the number of outcomes you want and n(S) is the number of outcomes possible.

1) A jar contains seven ping-pong balls, numbers 1 through 7. Two balls are drawn from the jar, and the ball drawn first is not replace before the second is drawn.
    a) What is the probability that both balls have even numbers on them?

    b) What is the probability that one ball has a 5 on it?

2) Assume that three playing cards are dealt from a thoroughly shuffled standard deck of cards.
    a) What is the probability that the first card is a heart?

    b) What is the probability that the second card is a heart?

    c) If the first card is accidentally turned over and seen to be a heart, what is the probably that the second card is a heart?

3) Assume that the birth rate for boys is approximately 49%. Assume further that each birth is independent of the other and that the sex of a child is a random occurrence.
    a) If a couple's first two children are boys, what is the probability that their third child will be a boy?

    b) What is the probability that a couple's first four children will all be girls?

    c) If it is known that a couple's first two children are boys, what is the probability that all four of the couple's children are boys?

References

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