THE BOWERBIRD'S DILEMMA

NOT FOR HIS DRAB, MEAGER PLUMAGE, BUT FOR THE BOWER HE BUILDS: A GREAT THING WOVEN FROM TWIGS AND LEAVES, AND OFTEN DECORATED WITH SHINY SHELLS, COINS, AND PARROT FEATHERS.

I'M AN ARTIST, ALL RIGHT?

(ACTUALLY, THERE ARE AT LEAST 18 SPECIES OF BOWERBIRD, OF WHICH SOME THREE-QUARTERS BUILD A BOWER OF ONE KIND OR ANOTHER.)

AT MATING TIME, THE FEMALE BOWERBIRD VISITS EACH BOWER IN TURN, JUDGING ITS MERITS WHILE THE BUILDER WARKLES HIS LONGING.

CHORTLE YODEL FLIRT

IF SHE LIKES THE EFFECT, PASSIONATE BOWERBIRD MATING ENSUES.

SO... WHERE'S YOUR GALLERY?

ON THE BOWER, NATURELLY.

FLUTTER WAGGLE

STAKES ARE HIGH! SOME ARTISTIC MALES WIN DOZENS OF MATES, WHILE OTHERS, AFTER WORKING LIKE DOGS, SUFFER REJECTION AFTER REJECTION.

ALSO CRITIC? DERIVATIVE...

NO WONDER, THEN, THAT BESIDES BUILDING HIS OWN BOWER, A MALE ALSO TRIES TO RUIN HIS NEIGHBOR'S! IN NO TIME, HE CAN DO DAMAGE THAT TAKES HOURS TO REPAIR...

HEY! HAVEN'T YOU HEARD OF APPROPRIATION ART?

BUT THEN, WHILE HE'S OUT MARAUDING, HIS OWN BOWER IS LEFT DEFENSELESS... SO WHAT'S THE POINT?

OH, FOR -

TO ESTIMATE THE COSTS AND BENEFITS OF MARAUDING BEHAVIOR, CHICAGO ORNITHOLOGISTS STEPHEN AND MELINDA PRUETT-JONES TURNED TO GAME THEORY, THE BRANCH OF MATHEMATICS THAT COMPUTES THE PAYOFFS OF COMPETING STRATEGIES.

THE COUPLE MODELED THE COMPETITION AS A GAME BETWEEN TWO BOWERBIRDS, EACH WITH A CHOICE BETWEEN OCCASIONAL MARAUDING AND A PURE, STAY-AT-HOME GUARDING STRATEGY.

THEY WROTE EQUATIONS FOR THE NUMBER OF MATINGS - I.E., THE PAYOFF - A BIRD COULD EXPECT UNDER DIFFERENT CONDITIONS...

PASS THE ALGEBRA BOOK.
AND FILLED IN A MATRIX SOMETHING LIKE THIS (THEIRS ALSO INCLUDED MORE TERMS SPECIFICALLY FOR DECORATION-STEALING, OMITTED HERE FOR SIMPLICITY):

THE EXPRESSION $E(G, M)$, FOR EXAMPLE, MEANS THE EXPECTED PAYOFF TO A GUARDER WHOSE OPPONENT IS A MARAUDER.

Bird 1

G      M
E(G, G)  E(M, G)
E(G, M)  E(M, M)

Bird 2

G      M
E(G, G)  E(M, G)
E(G, M)  E(M, M)

SO FAR, SO GOOD—EXCEPT FOR ONE UNSETTLING FACT:

IN SHORT, $E(G, G) < E(M, G)
E(G, M) < E(M, M)
BUT ALSO $E(M, M) < E(G, G)$

ALAS!

THIS PARADOX, CALLED THE PRISONER'S DILEMMA, IS A HOT TOPIC IN GAME THEORY... WHEN PLAYED REPEATEDLY, IT SEEMS TO CALL FOR A FLEXIBLE STRATEGY BASED ON YOUR OPPONENT'S LAST MOVE...

O.K... O.K... LET ME TRY TO THINK THIS THROUGH...

BIRDS! BIRDS! WE'RE ALL VICTIMS OF THE SYSTEM! WHY CAN'T WE JUST AGREE TO LIVE IN PEACE?

HEY, CMON, YOU MEN! LET'S SEE SOME FEATHERS FLY!!

WHAT'S A BOWERBIRD TO DO? SCIENTISTS AIN'T SURE... ASIDE FROM SOME PARTIAL OBSERVATIONS, NO THOROUGH STUDY OF INDIVIDUAL MARAUDING DIFFERENCES HAS BEEN DONE...

I'M GOING TO LEAVE YOU ALONE UNTIL YOU MESS WITH ME!

I'M GOING TO QUIT THE GAME AND BECOME A MONK...

I'M GOING TO ATTACK ANYTHING THAT PUSHES MY ANGRY BOWERBIRD BUTTONS!

BUT RESEARCH CONTINUES!

HEY!! WHO MESSUP OUR PAPERS?