

HOW EVOLUTION REWARDS CHEATERS P.38

# Discover

SCIENCE FOR THE CURIOUS

OCTOBER 2018

## Weight Loss Science

for

- > Better brain health
- > Lower disease risk
- > Longer life span P.26

PLUS

A New Tool to Solve Crimes P.10

Shape-Shifters of Math P.42

Why Do We Need Sleep, Anyway? P.50



DISCOVERMAGAZINE.COM

646  
148  
P0339  
05248  
S

#BXBLCR \*\*\*\*\*CAR-RT WSH\*\*C-031  
#2917 5485 840# JUN19  
5248

C-O B SIMBORIO  
2131 MARBELLA AVE  
CARSON CA 90745-1339

55.99 U.S.

# Contents

OCTOBER 2018

VOL. 39, NO. 8



Cooperation with other species can offer a survival advantage, though some don't hold up their part of the bargain. See page 36.

## FEATURES

### 26 Not So Fast

Dieters are losing weight following a plan that might also improve memory and extend life. Is it for real?

BY MARK BARNA

### 36 How Cheaters Prosper

Usually, animals cooperate with each other for mutual benefits. Learn why some go rogue. BY KRISTIN OHLSON

### 42 Shape Shifters

A malleable branch of math with an approach akin to a surrealist's fever dream may one day change the course of technology.

BY DEVIN POWELL

### 50 Searching for the Sandman

Scientists are unraveling the mysteries of sleep.

BY HENRY NICHOLLS

# Contents

## COLUMNS & DEPARTMENTS

### 6 EDITOR'S NOTE

#### Counting Calories

Dieting is a lot simpler than it used to be — there's no calculator required.

### 7 INBOX

Readers weigh in on "octopi," magic mushrooms and munching crickets.

### 9 THE CRUX

Conflicting studies spur debate on old brains and new neurons; a revolutionary method helps police track spent bullets to criminals; a new paper could shake up California's earthquake predictions; sporting events take a bite out of crime in the Windy City; and more.

### 18 VITAL SIGNS

#### Low Note

A teenage girl shows symptoms normally associated with male puberty. BY JULIA MICHIE BRUCKNER

### 22 NOTES FROM EARTH

#### A River Runs Through It

One scientist studies waterways to learn how they behave during extreme weather events. BY BARBARA FRASER

### 66 HISTORY LESSONS

#### The Coroner Crisis

The challenges forensic pathologists face today are not without precedent.

BY EMILIE LE BEAU LUCCHESI



### 57 OUT THERE: BONUS ASTRONOMY SECTION

A mission to Jupiter's asteroids could reveal how our solar system formed. Plus, peruse 60 years of false alarms in the hunt for E.T.

### 70 PROGNOSIS

#### Cellular Cyborgs

By programming organic life like a micro machine, scientists may develop ways to regulate body chemistry and create better medical treatments.

BY ERIC SMALLEY

### 74 20 THINGS YOU DIDN'T KNOW ABOUT ...

#### Poison

The wrong dose can do you harm, but when it's right, your pain and wrinkles might go away.

BY GEMMA TARLACH



The venomous slow loris



## ON THE COVER

How Evolution Rewards Cheaters p.36

Weight Loss Science p.26

A New Tool to Solve Crimes p.10

Shape-Shifters of Math p.42

Why Do We Need Sleep, Anyway? p.50

COVER: Design36/Shutterstock