

Ska Bra Conference
Oslo, Norway
March 4, 2020

Updates in Norway Rat Pest Management 2020

Bobby Corrigan, Ph.D.
Urban Rodentologist

New York City Dept. of Health
and
Corrigan Consulting

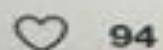
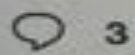
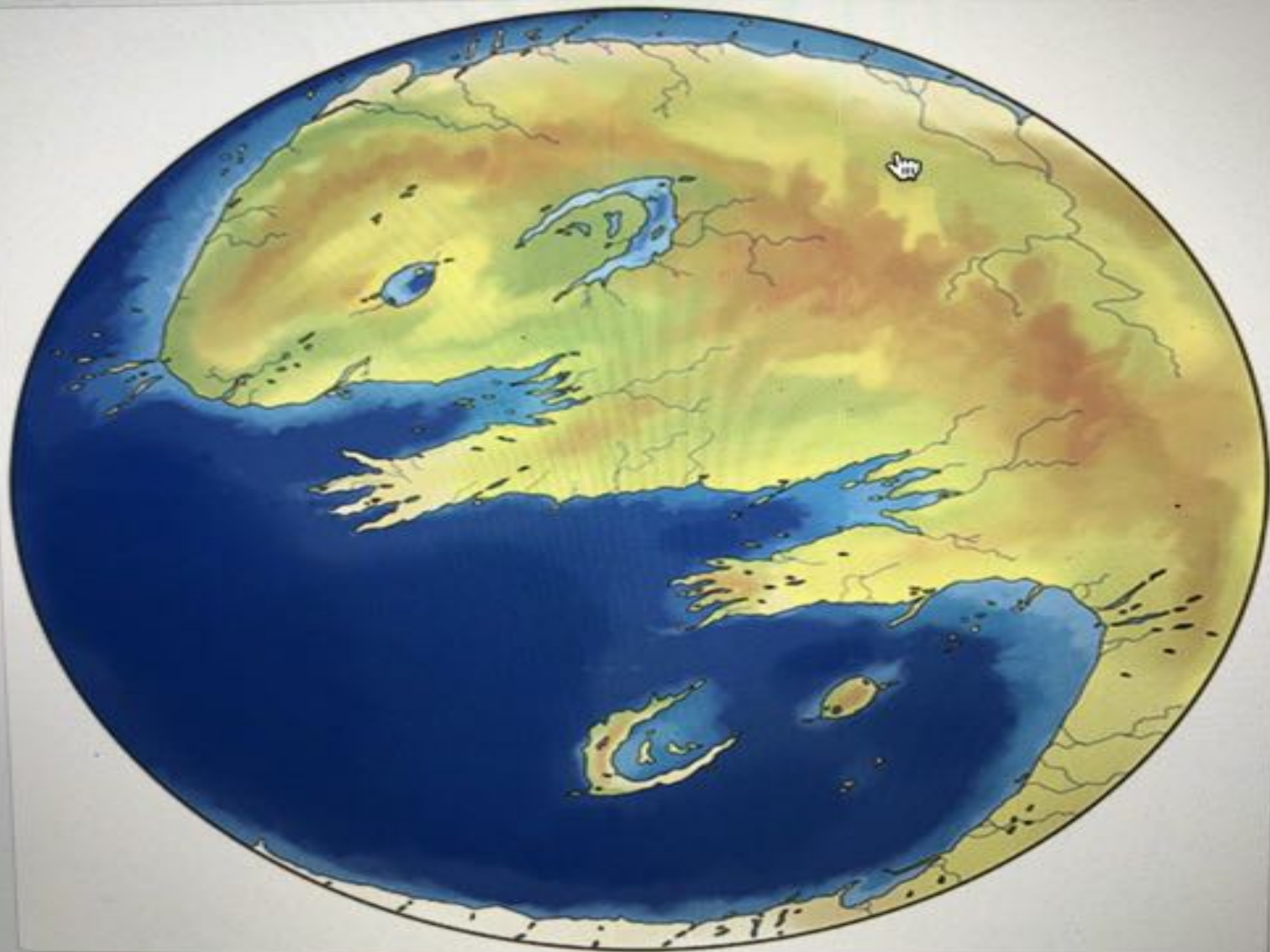
Twitter: @Rodentologist

**Thanks Ska Bra 2020
for the honor!**

Rune Bratland

Erik Thomas Gjoime

On the road :
Rodentologist
Excitement











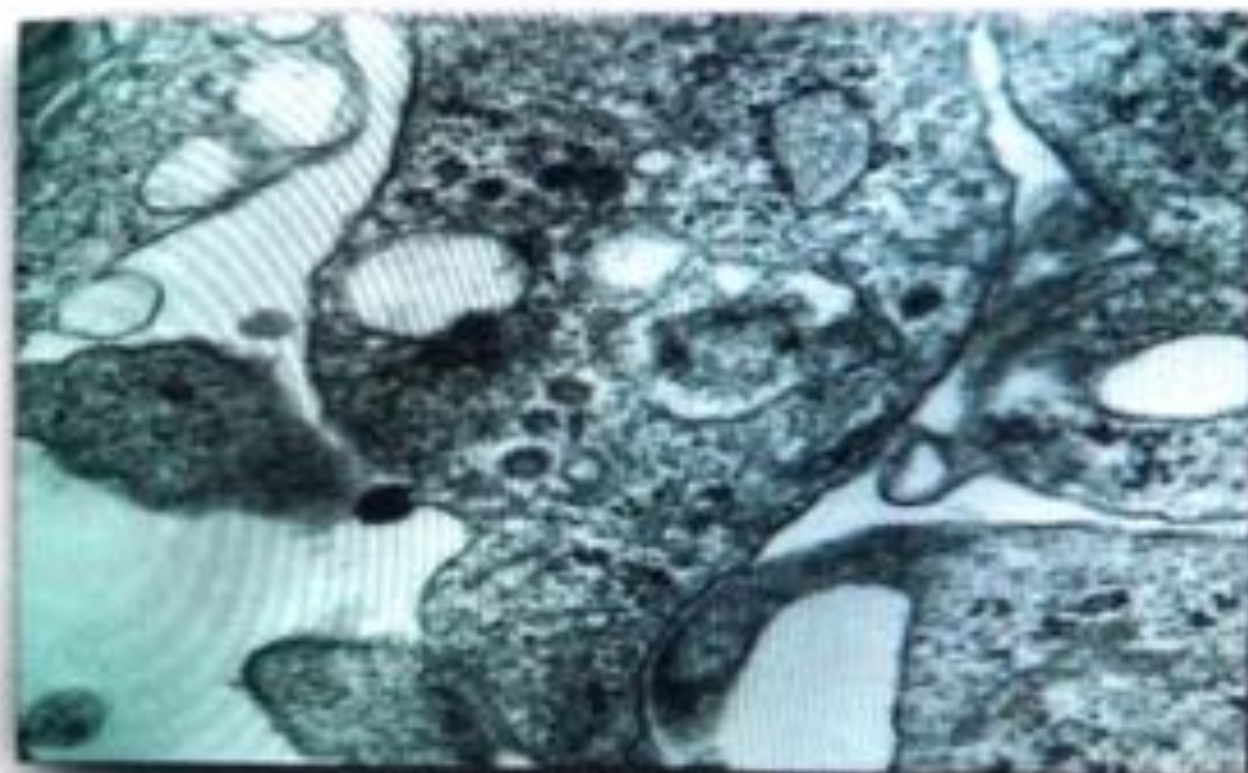




The 2020 public health significance of urban rodents

Look Inside

Emerging Viruses



Edited by Stephen S. Morse

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Novel Coronavirus ▶

A novel coronavirus was first detected in China in January 2020. Thousands of people worldwide have been infected, and you can protect yourself.

RESEARCH ARTICLE

Detection of Zoonotic Pathogens and Characterization of Novel Viruses Carried by Commensal *Rattus norvegicus* in New York City

AQ:40 Cadhia Firth,* Meera Bhat,* Matthew A. Firth,b* Simon H. Williams,* Matthew J. Frye,* Peter Simmonds,* Juliette M. Conte,* James Ng,* Joel Garcia,* Nishit P. Bhuvra,* Bohyun Lee,* Xiaoyu Che,* Phenix-Lan Quan,* W. Ian Lipkin*

AQ:40 Center for Infection and Immunity, Mailman School of Public Health, Columbia University, New York, New York, USA^a; Immunology Program, Memorial Sloan-Kettering Cancer Center, New York, New York, USA^b; New York State Integrated Pest Management Program, Cornell University, Elmsford, New York, USA^c; University of Edinburgh Centre for Immunology, Infection and Evolution, Ashworth Laboratories, Edinburgh, United Kingdom^d

* Present address: Cadhia Firth, CSIRO Biosecurity, Australian Animal Health Laboratory, Geelong, Victoria, Australia; Matthew A. Firth, Division of Molecular Immunology, Walter and Eliza Hall Institute of Medical Research, Melbourne, Victoria, Australia

ABSTRACT Norway rats (*Rattus norvegicus*) are globally distributed and concentrate in urban environments, where they live and feed in closer proximity to human populations than most other mammals. Despite the potential role of rats as reservoirs of zoonotic diseases, the microbial diversity present in urban rat populations remains unexplored. In this study, we used targeted molecular assays to detect known bacterial, viral, and protozoan human pathogens and unbiased high-throughput sequencing to identify novel viruses related to agents of human disease in commensal Norway rats in New York City. We found that these rats are infected with bacterial pathogens known to cause acute or mild gastroenteritis in people, including atypical enteropathogenic *Escherichia coli*, *Clostridium difficile*, and *Salmonella enterica*, as well as infectious agents that have been associated with undifferentiated febrile illnesses, including *Bartonella* spp., *Streptobacillus moniliformis*, *Leptospira interrogans*, and Seoul hantavirus. We also identified a wide range of known and novel viruses from groups that contain important human pathogens, including sapoviruses, cardioviruses, kobuviruses, parechoviruses, rotaviruses, and hepaciviruses. The two novel hepaciviruses discovered in this study replicate in the liver of Norway rats and may have utility in establishing a small animal model of human hepatitis C virus infection. The results of this study demonstrate the diversity of microbes carried by commensal rodent species and highlight the need for improved pathogen surveillance.



ENEMY AT THE GRATES

On the front lines of humanity's high-tech, global war on rats

By Josh Dzieza

Last May, a member of Alberta's rat control squad paid a visit to a farm on the outskirts of

Charles H. James Nat Geo 2018



Of Mice and Microbes: New York City House Mice as Reservoirs for Pathogenic Bacteria and Anti-Biotic resistance

2018.

S H. Williams, X. Che, A. Paulick, C. Guo, B. Lee,
D. Muller, F Lowy, R.M. Corrigan, W. Ian Lipkin

Molecular Biology

Our 2018 studies found NYC wild house mice were infected with

Clostridium difficile

Campylobacter

Leptospira spp

Toxoplasma gondii

Shigella

Salmonella

and.....

Antimicrobial resistance (AMR) bacteria

"The house mouse may be directly contributing to the overall abundance of AMR genes in the urban environment. Antimicrobial resistance (AMR) poses a significant threat to human health and several reports describe immediate concerns of AMR for NYC, as well as for many other major cities containing house mouse populations."

Just another day in pest control & public health in Norway?

Those of us here today *protect*:

1. The food that they eat
2. The roof over their heads
3. Their health
4. Their safety
5. Comfort /peace of mind.

Observational Biologists

Whether you realize it or
not, *if you are at this
week's Ska Bra meeting,*
you must be an
Observational Biologist.

Observational Biologists

We must be trained to see
what others overlook.

A simple urban recipe for rats:

1. Places to nest/ hide (down into earth or substitute)
2. Dependable daily food

14 to 70g
of *nutritious* food
every day.

(e.g., 1 chunk of one unfinished
bagel w/butter would do it)





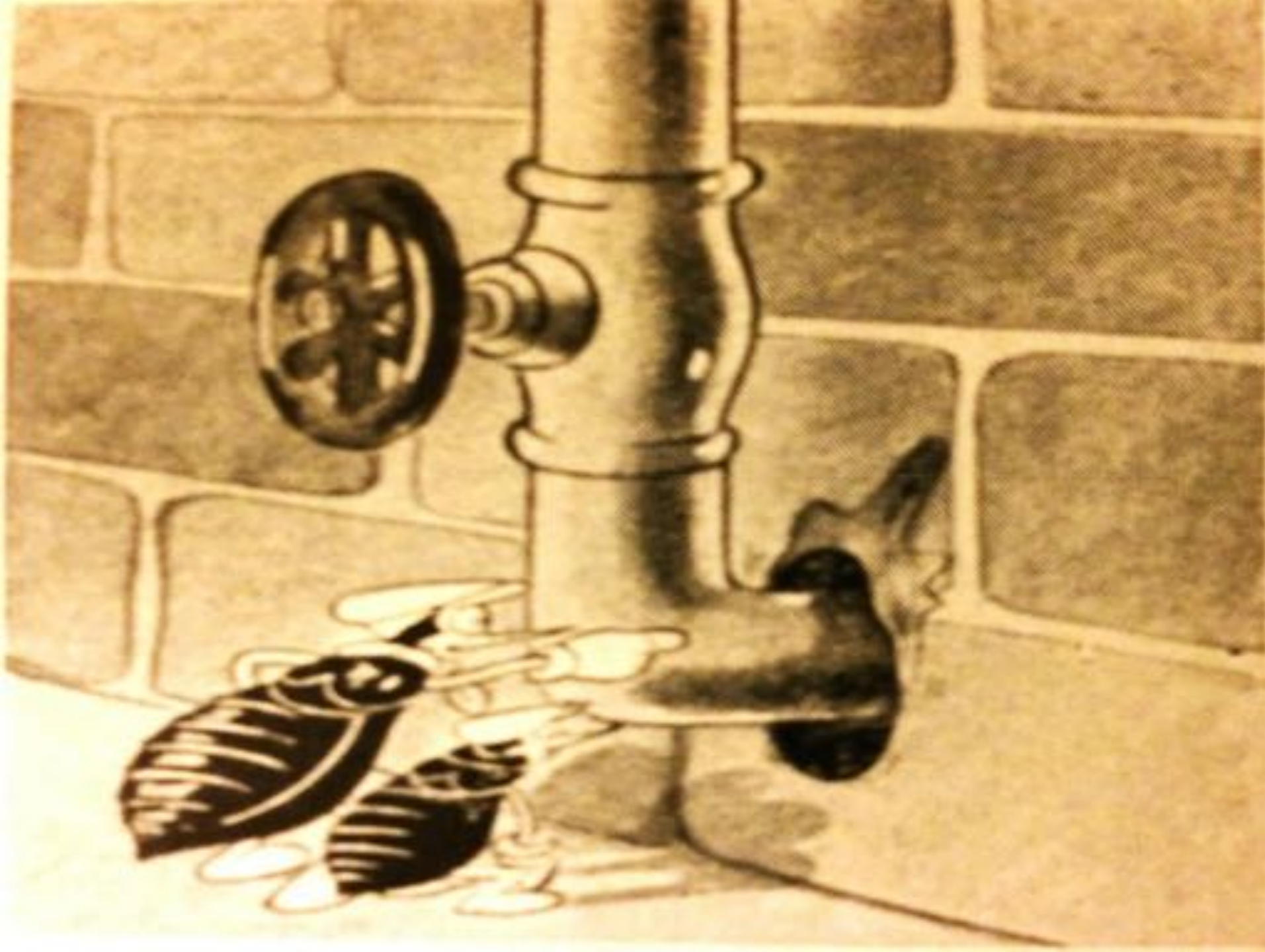
*Rats strongly
respond to:*

*Squeeze points
Shadows*



Squeeze Point Behaviors
dictate so much of what we
(should) do.

















Once inside, rodents seek highly
protective spaces **away**
from H. sapiens.

Cavities

Ceilings

Narrow Floor voids

Within Commercial Equipment













Bobby Corrigan





The pest management
industry's response to the
global war on rodents:

2020

Rat Control 2020

1. Sanitation (no food ; no rats)
2. Rat proofing
3. Monitoring (sensors)
4. Traps
5. Rodenticides







**Fish. Where.
The. Fish.
Are.**

Reading Trout Water

2nd Edition



Dave Hughes

**Rodent. Where.
The. Rodents.
Are.**





Use these words to decide where you are going to put your rodent equipment

Shadows

Lines

▲

Corners

Warmth

Holes

Sebum trails

Monitoring Technology

Electronic Remote Pest
Monitors

Rodent Cams





A

B

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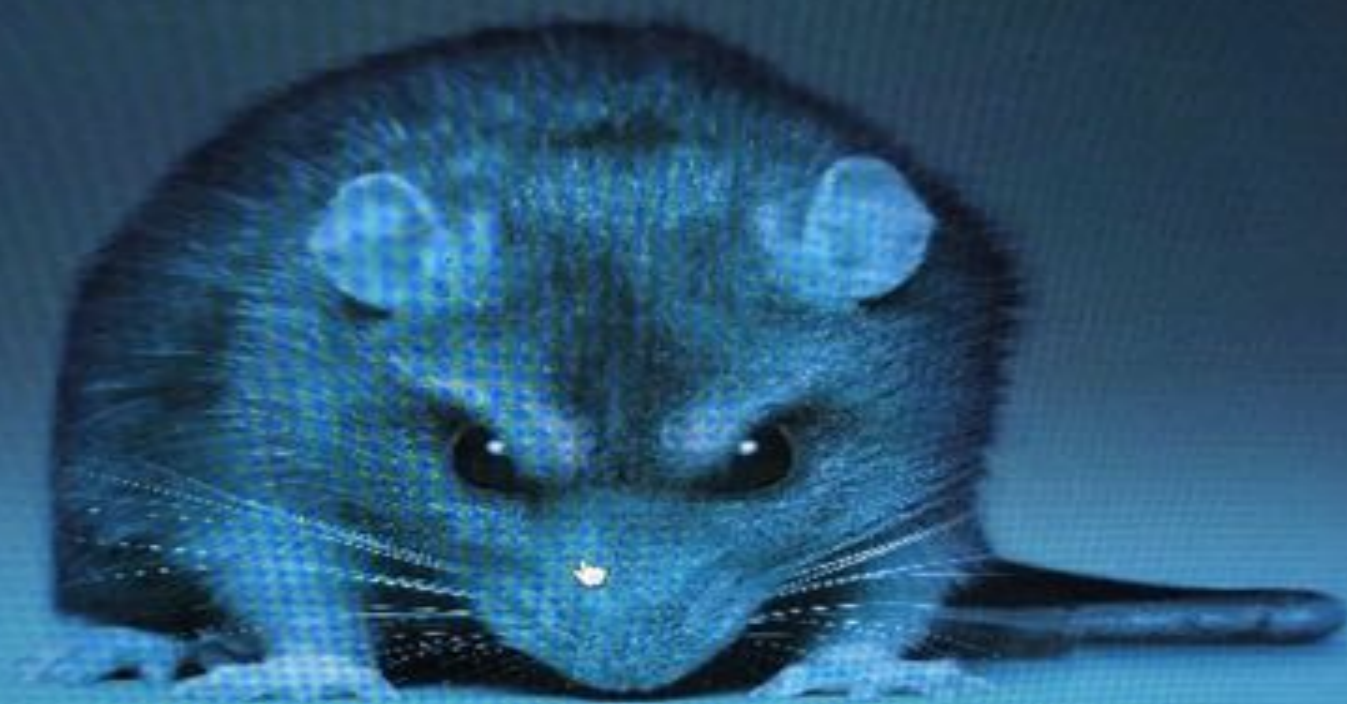
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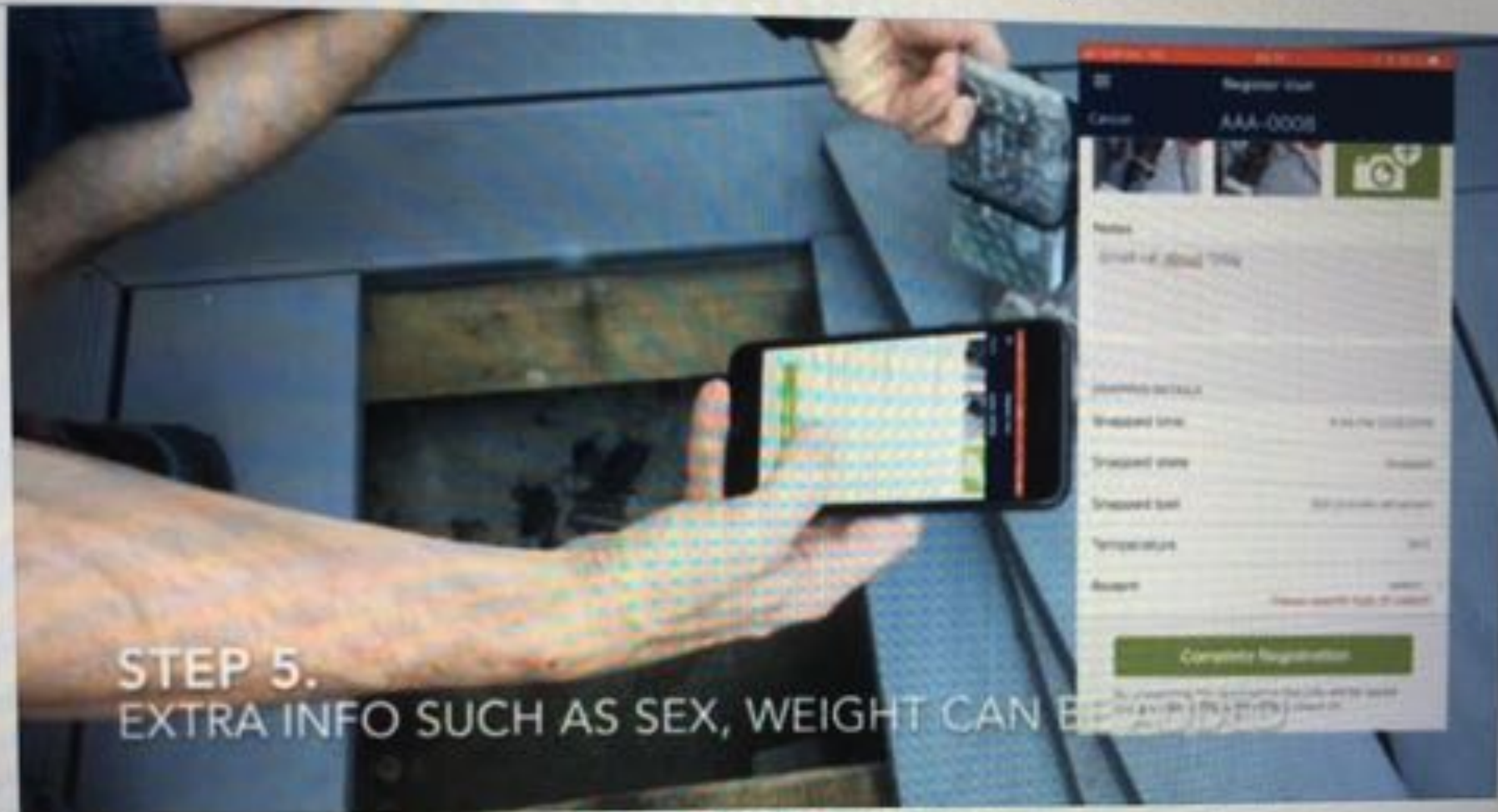


Rodent
Monitoring System



**A GAME-CHANGING
STRATEGY IN RODENT CONTROL.**

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STEP 5.

EXTRA INFO SUCH AS SEX, WEIGHT CAN BE ADDED

RATMO Rodent monitor

by Alistair Morton / 4 months ago

A run thought of the RATMOs deployment, including recovery of a rodent after.

<http://www.arctic-systems.com>



...if it is so that they can watch the video too.

WHAT IS



What if you knew every rodent activity at your account?

iQ™ technology will transform your technicians from inspectors into problem solvers, fixing issues at accounts faster and smarter.

TAKE THE GUESSWORK OUT OF YOUR SERVICE

- Instantly knowing which devices have rodent activity will provide a PMP with real information that will allow rodent control measures to be deployed where they will matter most.

BE A KNOW IT ALL:

- Time-savings – skip inspections and begin problem solving right away
- Information gathering – know when rodents are traveling with timestamps, what bait is being deployed at accounts and how much, as well as trend analysis
- Multiple product lines for all of your rodent control needs for an entire facility
- Give your customers confidence and peace of mind that they've hired the right team for the job

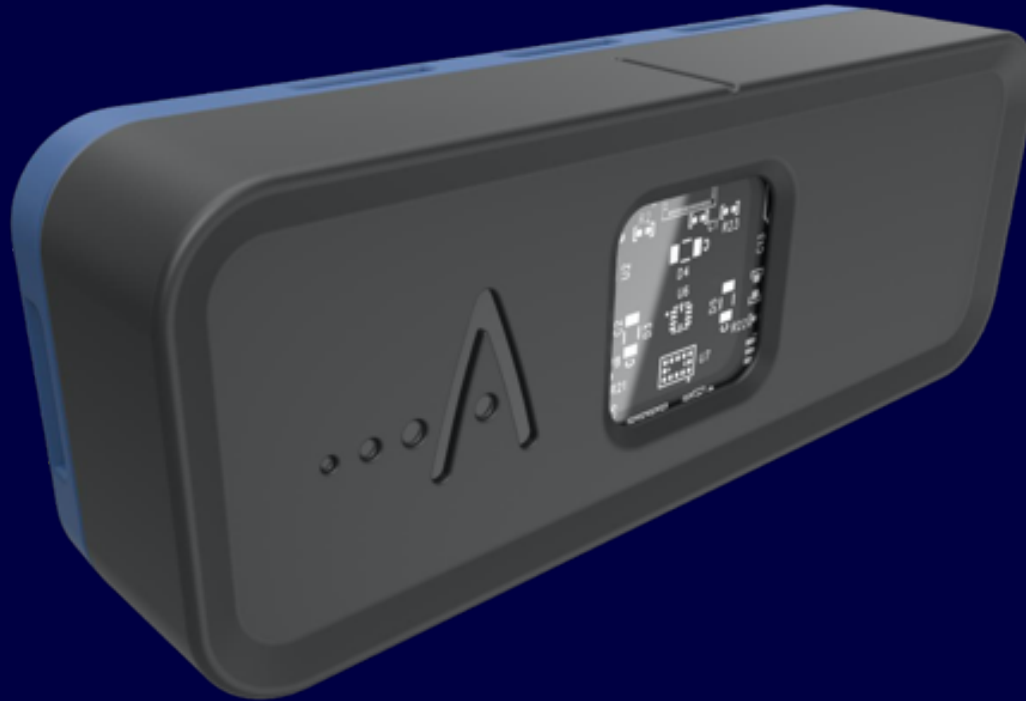


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ActiveSense AIR Sensor



Rodent Camming

(rats and mice).



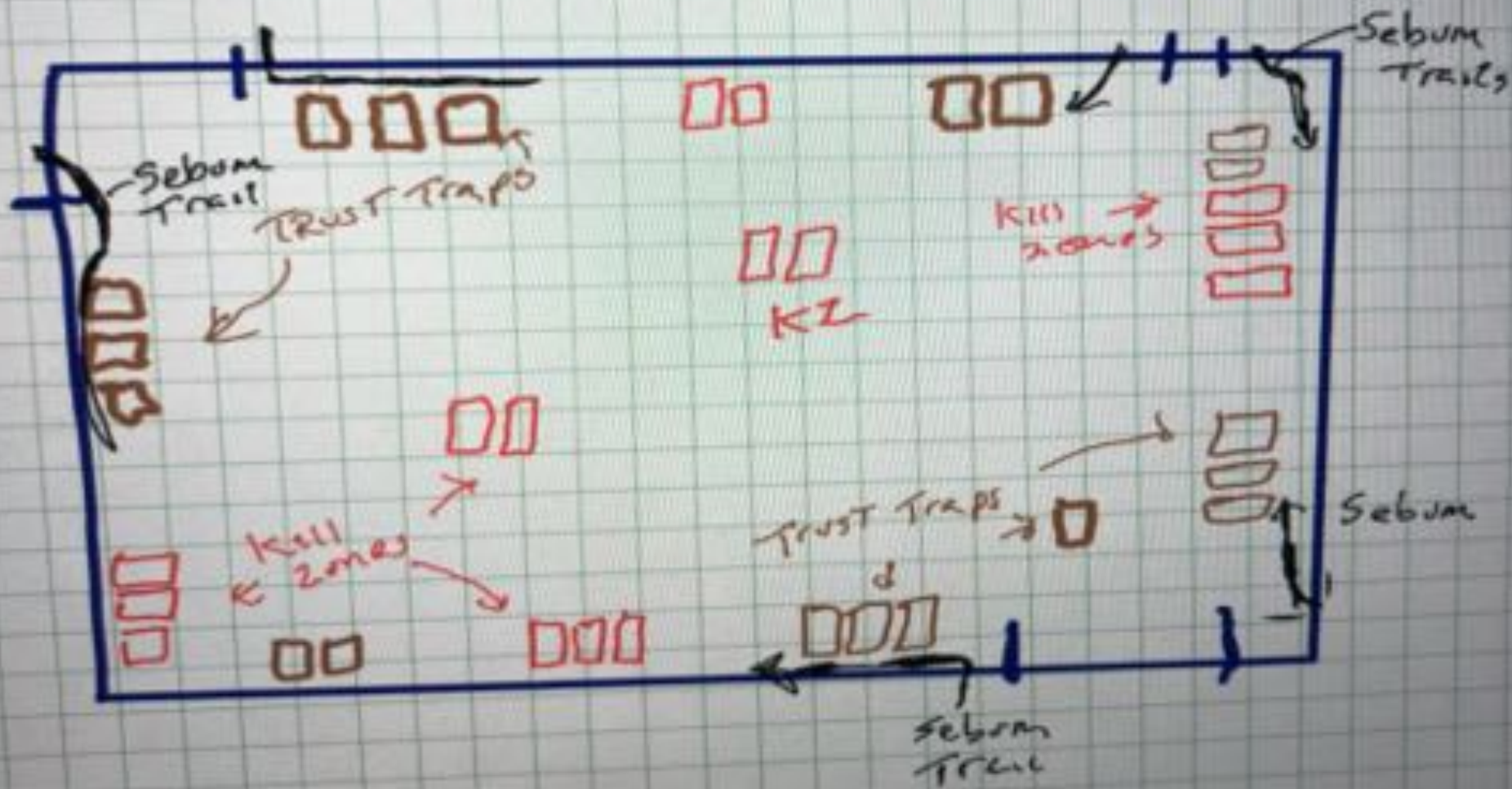




Trapping
Requires
Attention to
Details.



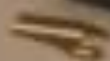
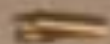
Assessment Enhanced Snap-Trapping Knockdowns

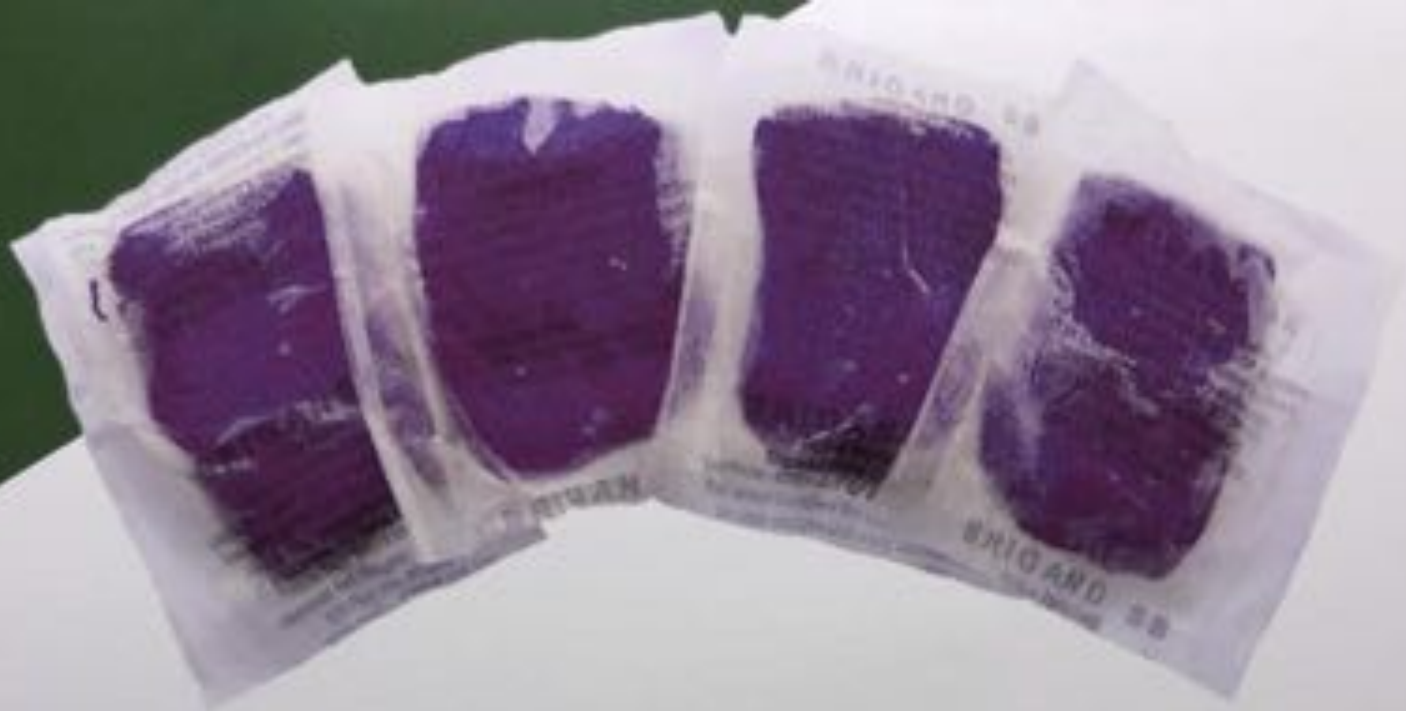














Trapping and Baiting Tips

1. Find the primary runways
2. Sebum, hair, shadows,
corners
3. Must reduce established
food sources.



12/10/2019 11

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