

SYSTEMATIC STUDY OF TECHNETIUM CONTAMINATION  
THROUGH PROTON BOMBARDMENT OF MOLYBDENUM

A Dissertation

Submitted to the Graduate School  
of the University of Notre Dame  
in Partial Fulfillment of the Requirements  
for the Degree of

Doctor of Philosophy

by

Edward A. Lamere

---

Manoel Coud r, Director

Graduate Program in Physics

Notre Dame, Indiana

August 2017

© Copyright by

Edeard Lamere

2017

All Rights Reserved

SYSTEMATIC STUDY OF TECHNETIUM CONTAMINATION  
THROUGH PROTON BOMBARDMENT OF MOLYBDENUM

Abstract

by

Edward A. Lamere

## Dedication

## CONTENTS

FIGURES . . . . .	iv
TABLES . . . . .	v
ACKNOWLEDGMENTS . . . . .	vi
SYMBOLS . . . . .	vii
CHAPTER 1: INTRODUCTION . . . . .	1
1.1 Overview . . . . .	1
1.1.1 Background . . . . .	1
1.1.2 Foreground . . . . .	1
1.2 Groovin' Gnus . . . . .	4
BIBLIOGRAPHY . . . . .	6

## FIGURES

- 1.1 Location distributions by day of where, where the X axis is the weekday  
(0 through 6), and the Y axis is the sighting frequency . . . . . 3

## TABLES

1.1	WHERE Gnus LIKE TO EAT . . . . .	2
1.2	WHAT Gnus LIKE TO EAT ON THE NOTRE DAME CAMPUS, LISTED BY AVERAGE NUMBER OF SIGHTINGS PER WEEK- DAY . . . . .	4

## ACKNOWLEDGMENTS

I would like to acknowledge the invaluable mentorship of Manoel Couder...



## SYMBOLS

$E$  energy

## CHAPTER 1

### INTRODUCTION

#### 1.1 Overview

This is an overview of the introduction. In here, I will use many many buzzwords and other legalistic-types of terms, mostly beginning on the expounding of the holistic and synergistic energy that Gnus bring to our organizations.

##### 1.1.1 Background

In preparation for reading this dissertation[1], I would highly recommend reading some of the other material available on Gnus [2, 3]. They are very well written and will give you a fuller understanding of Gnus.

Gnus are frequently mistakes for squirrels. They are not squirrels. They are Gnus. Don't call them squirrels, either (unless you have food in your hand); they tend to get a bit upset.<sup>1</sup> If you have food in your hand, they tend to ignore this insult and accept your food as a peace offering.<sup>2</sup>

##### 1.1.2 Foreground

Table 1.1 shows some feeding frequencies for where Gnus like to eat around the Notre Dame campus. Gnus have work weeks, just like humans do, hence the much

---

<sup>1</sup>This is frequently mistaken for the chattering and scampering away. Gnus are actually quite polite; they will leave if they have nothing nice to say, for fear of saying something offensive.

<sup>2</sup>Sometimes they'll follow you if you continue to refuse to feed them.

TABLE 1.1

## WHERE Gnus LIKE TO EAT

Location	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Front of Dome	1	5	6	5	4	5	1
Stonehenge	2	9	10	12	9	14	2
The Rock	1	3	4	3	4	3	0
The ACC	3	4	5	5	5	4	1
Dining Halls	5	14	12	13	14	12	3
Hesburgh Library	2	3	5	2	3	4	2

lower frequencies on weekends. This can lead us to conclude that Gnu weekend shifts are much smaller than the normal work-week shifts. In fact, we can attempt to parametrize the sighting frequency,  $\mathcal{F}$ , by the student population, type of food, and day of the week as:

$$\mathcal{F} = \mathcal{F}(p, f, d). \quad (1.1)$$

Table 1.2 shows what they typically like to eat.

Figure 1.1 shows a nice graph of location distributions by day of week. I have no real reason for including it except to show that figures work as well. Did I mention that Gnus are really cool?

Gnus typically tend to come out when there are large gatherings of humans with food. Gnus work very hard at providing us with all the things that we like (trees, dirt, air, etc.), and so we should freely give them food. They will come up and stand a respectful distance away from you, waiting to see if they will be rewarded for their efforts. If you offer some food, they will take it and back off a respectful distance in

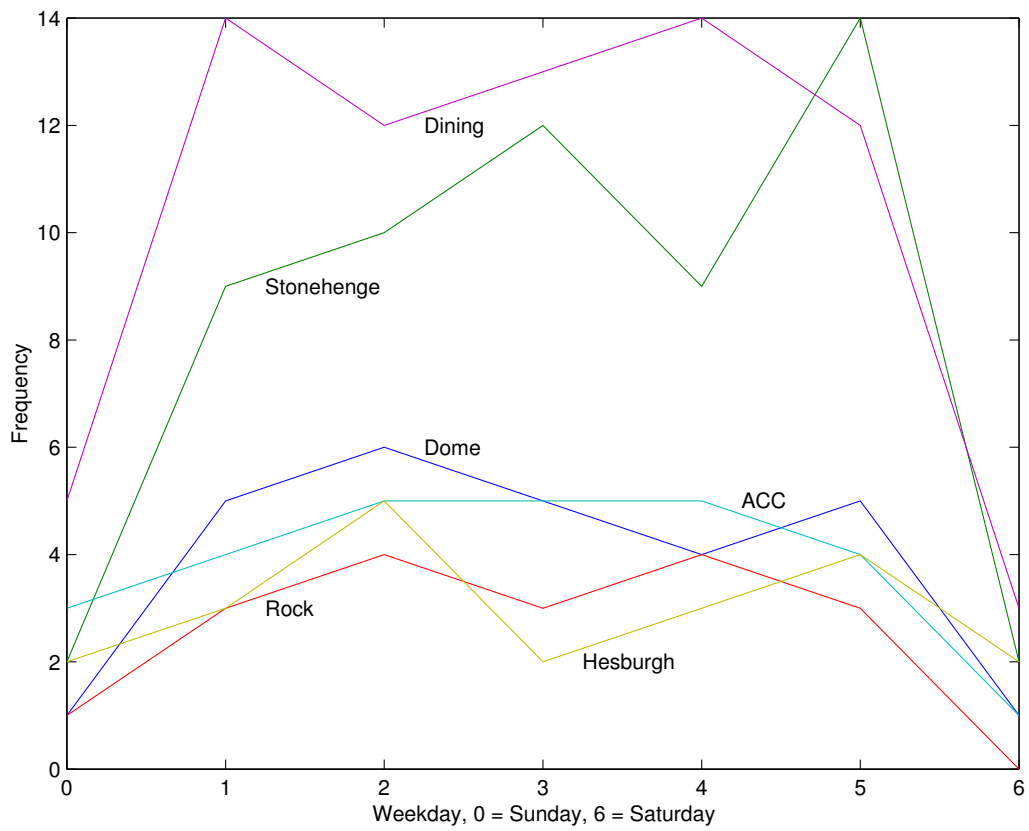


Figure 1.1. Location distributions by day of where, where the X axis is the weekday (0 through 6), and the Y axis is the sighting frequency

TABLE 1.2

WHAT Gnus LIKE TO EAT ON THE NOTRE DAME  
CAMPUS, LISTED BY AVERAGE NUMBER OF  
SIGHTINGS PER WEEKDAY

Food	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Twinkies	1	5	6	5	4	5	1
Ding Dongs	2	9	10	12	9	14	2
Carrots	1	3	4	3	4	3	0
Lettuce	3	4	5	5	5	4	1
Twizlers	5	14	12	13	14	12	3
Jawbreakers	2	3	5	2	3	4	2

order to consume their food while leaving you to your “personal space.”

## 1.2 Groovin’ Gnus

Gnus do tend to stay away from humans in their normal day-to-day workings. This is mainly because humans don’t, for the most part, understand what they are doing. If a Gnu is working, and a human approaches it, the Gnu will tend to drop whatever it is doing and run away. This is probably do to the tendency for humans to have “group meetings” and “productivity seminars.” Most Gnus are deathly afraid of such overmanagement, and run at the slightest hint of it, for fear that it will cripple their real work.

It is interesting, however, that Gnus have chosen an Institution of Higher Education for their BOO.<sup>3</sup> It is often said that:

---

<sup>3</sup>Base of Operations.

Academic politics are the dirtiest, meanest, ugliest, and generally the most low-down, in-your-face, and kick-em-while-they're-down than anywhere else (even Washington D.C.) because the stakes are so low.

It has been hypothesized that the Gnus are subtly trying to affect a change for the better (i.e., eliminating the overmanagement problems) by working the very system that they are trying to change, from within. That is, the graduates from Notre Dame can learn from the examples of the Gnus here, and run screaming (or chattering) at the slightest hint of overmanagement, and let the real work proceed unhindered.

## BIBLIOGRAPHY

1. F. Bnard, K. R. Buckley, T. J. Ruth, S. K. Zeisler, J. Klug, V. Hanemaayer, M. Vuckovic, X. Hou, A. Celler, J.-P. Appiah, J. Valliant, M. S. Kovacs, and P. Schaffer. Implementation of Multi-Curie Production of  $^{99m}\text{Tc}$  by Conventional Medical Cyclotrons. *J Nucl Med*, 55(6):1017–1022, June 2014. ISSN 0161-5505, 2159-662X. doi: 10.2967/jnumed.113.133413. URL <http://jnm.snmjournals.org/content/55/6/1017>.
2. G. Ganston and G. Greenfield. *Gnus and You: The Art of Being New*, volume I. Grapping Books, NY, August 1998.
3. G. Greenfield. *Getting to Know Gnu*. PhD thesis, Geoffrey Garfield School of Gnus, August 1996.

*This document was prepared & typeset with pdfL<sup>A</sup>T<sub>E</sub>X, and formatted with NDdiss2<sub>ε</sub> classfile (v3.2013[2013/04/16]) provided by Sameer Vijay and updated by Megan Patnott.*