T-M

TRANSPORTATION-MARKINGS
GENERAL CLASSIFICATION

3rd Edition

Brian Clearman

Mount Angel Abbey

2010

TRANSPORTATION-MARKINGS

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TRANSPORTATION-MARKINGS:

GENERAL CLASSIFICATION

Part H, 3rd Edition

Volume II, Further Studies

Transportation-Markings: A Study in Communication Monograph Series

Brian Clearman

Mount Angel Abbey 2010

Dedicated To:

James Dwight Dana (1813-1895) author of the *System of Mineralogy* and scientific descendents who continue the System.

The seventh edition of the *System of Mineralogy* (Volume I, 1944) with its numerical classification has been an especially notable influence on Transportation-Markings taxonomy.

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PREFACE

While Part H is a short document it, nonetheless, has a major role in T-M studies. It draws together the entire range of diverse and numerous T-M forms. It accomplishes this task by constructing a taxonomic matrix that unifies all of Transportation-Markings in a twofold manner: through the transportation modes as well as through the energy forms underlying the messages. Messages are arguably a third force in the study. The diversity of markings is further amplified by including a variant classification for each of the transportation modes.

Taxonomies presuppose nomenclature or rules for classifying objects of whatever sort. Chapter 4 includes both background information as well as rules for the classification. The first edition of Part H provided an index of classifications and nomenclatures for Parts A-G. The second addition included references to classification and indexes for the Database, Parts Ii-iv. This edition adds Part Iv as well as the second editions for Part Ii-iv.

During a sabbatical in Humboldt County (California North Coast) in 1991 this writer followed a dual regimen: research and writing in T-M (Part A, 2nd ed; portions of Parts F and G), and reading in the Theology of Creation. The two interests were tied together through the composition of a "psalm" (the term canticle can also be employed) that presented the panoply of T-M forms in a psalm format.

That format was suggested by Biblical psalms and canticles both of which offer an approach to the theology of creation of great depth. Both the second edition and this third edition offer revisions of that original psalm/canticle.

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The T-M project had the form of a quarternity twice over (4+4) in the 1994 edition. Further monographs and additional editions of some of the studies were added (some are completed while others are in process or projected). The quaternity formulation has shifted over the past decade and a half: from a quadrapule quarternity to sextuplet and to the present project form of a ninefold configuration (nine quarternities). The original work (Vol. I) contained Parts A, B, and C/D and can be viewed as either as one study or three studies. Volume II includes Parts E-H. Part E has two editions, Parts F and G have one edition each while Part H has three editions. Volume II results in seven studies. The Database has five studies each with two editions for a total of 10 studies. Only the second edition of Part Iv is not written. The last volume has two studies: Part J which exists in one edition, and the projected Part K. The Table of Contents began with a first edition of few pages in 2002. There are now seven editions with perhaps one remaining to prepare.

Part B offers a more detailed study of T-M by focussing on the markings of one nation: the US. Much of the early classification of T-M (1969-1970) is at the core of this study as well as all of the later studies. Expansion of

classifications in Part B can be applied to broader studies. A second edition of Part B appeared in 1992.

Parts C (Floating Aids) and D (Fixed Aids) constitute a single work that focusses on marine aids. With hindsight it can be seen that a single part would have sufficed for marine aids with sub-parts for floating and land- based aids. A newer problem is that of space-based aids. GPS, a space-based aid, is a component of other electronic aids which are largely land-based. A change is needed in order to reflect the character of aids based in space. The 1988 second edition created a free-standing venue for the marine study; it was the first of the monographs to examine T-M forms in an international mode. The 3rd edition (2010) edition is marked by substantial changes. The general introduction has been merged with a separate fixed visual markings introduction. Separate chapters on buoy classifications and messages have now been merged. The radio aids chapter has also been altered because of the decline of older aids and the growth of GPS. Some changes have been made in fog signals coverage as those aids decline. The edition has fewer chapters and sub-chapters while adding more segments and sections.

Part E centers on traffic control devices; it constitutes the first free standing study (in its original state) as well as the initial entry for Volume II. The first edition was completed in 1984. The second edition in 2004 offers a significant change in direction. The first edition focussed on systems of TCD with an undergirding of history while the new edition focussed on T-M phenomena and gave less

attention to systems. The main classification has been reworked and a variant classification has been added.

Part F is devoted to railway signals and is the second unit of Volume II. While substantially completed in 1990 it underwent further revisions in 1991. It was published in 1992. However, it was listed as 1991 since the work was completed though not published in that year. Part F relies on national and limited regional materials since a more international range of signal guidelines and codes was less available for railway signals than other modes. It contains a variant classification and is the first monograph to include that form.

Part G, the aero navigation aids study, was completed in 1994 following research and writing over several years. It also includes a variant classification. The study views radio aids and visual aids as a single, unified study. That may run counter to a attitude that view radio aids as navigation aids, and visual aids as airport/airfield/visual/ ground aids. The monograph is the final unit of Volume II.

Part H in its first edition can be viewed as a post-transportation mode work that balances the pre-mode work of Part A. The second edition was post-mode twice over: that of the descriptive modal studies, and now of the database modal studies. The third edition has expanded the notes sections of the previous edition. It has merged two appendices (Nomenclature, and Index of Classification & Nomenclature) into a new fourth chapter. Sources materials in the earlier Preface have been reformulated into a

Bibliography.

Part I is divided into four modal-based components (Ii-ii-iii-iv). It is a database comprised of entries for the individual T-M forms. Part I was incrementally completed over the years 1997-2001 for the first edition. The second edition began in 2007 and ended in 2009. A fifth monograph serves as a composite categories classification and index. The first edition was in 2006. A second edition is projected.

Part J, a historical survey (1750-2000) of T-M appeared in 2002. It offers a brief review of the development of major forms within larger historical isssues.

Park K is a projected information/communication study of an integrative and wholistic nature. It is intended to draw together the elements of T-M (indicators, information, receiver and travel/route ways) by focussing on the inner dimensions without a focus on individual transportation modes and phenomena.

* * * * * * * * * *

The total T-M experience in itself can be viewed as a quarternity. The first of these elements has a tripartite structure: common impetus, common focus, common response. Safety problems occur thereby creating an impetus for safety aids. This impetus bears a substantial resemblance from one transportation mode and aid to the next. Safety aids have a common focus since the requirements for meeting

a safety need are also marked by a considerable measure of commonality. And the process of supplying safety aids generate a response in the producer that is similar for all modes of transportation.

The second element of the quarternity also exhibits three aspects. A parallel use of science, technology, and design is joined by overlapping and intertwining use of those disciplines as well. Science applied to acoustics, optics, and electronic impulses productions finds uses throughout T-M. The technical devices that create and emit message patterns are frequently not dissimilar and may be common to many forms of T-M. The principles of design and their application to markings are not confined to iso-lated entities within T-M but instead find a broadly shared use.

The third element of tools that can be applied to T-M studies forms a fourfold assemblage of taxonomy, semiotics, communications, and holarchy. Taxonomy is the focus of this study and notions of semiotics and communications influence -- sometimes implicitly and explicitly at other times -- the monographs of this Series and both affect and are affected by T-M. More recently holarchic ideas from A. Koestler have been added to the earlier menage of taxonomy, semiotics, and communications. The fifth edition of Part A reviews that topic as well as older topics.

The quarternity's final element is singular in construction and content. That element is a possible convergence of T-M forms through GPS. The development of Global Positioning Systems (GPS) was originally applied to

marine and aero navigation. However, GPS is under going extension into rail and road navigation as well. Those extensions are accompanied by off-road pedestrian usage and other personal uses. If those developments undergo further actualization then on one level a single T-M will become a reality.

Further development of GPS and various forms of Differential GPS may eventually require a fifth mode for the classification. Such a mode would transcend and include all other modes. It would center on satellite navigation systems of many forms. A true convergence could result in a unitary T-M with no more than secondary differentiation for specific applications.

A long-enduring interest in T-M by the writer has been joined by a newer interest in the theology of creation. While technology, including T-M forms, is only infrequently included in such a theology, there have been some efforts in this study to offer a hint of the workings of such a theology for this technological interest. This has been done through the medium of selections from the theological literature that can be applied to Transportation-Markings.

"I was driven to pursue connections
and enabled to perceive gaps and openings
which well-trained and -equiped craftsmen
did not notice, for they were busy with their
craft."

Rosemary Haugton, *The Passionate God,* 1981, 4.

CHAPTER ONE

INTERNATIONAL CLASSIFICATION WITHIN TRANSPORTATION MODE CONTEXT

"We communicate and navigate with a code of logos, symbols, emblems, and signs."

Susan Yelavich, *Design for Life* ... 1999, 171

"The entire universe for Teilhard is a divine milieu, a mystical milieu, wherein all things become diaphanous and transparent to reveal the divine presence. Through a mysterious and unexpected grace, the very heart of the universe ignites to disclose the divine fire permeating all things."

Egan, *Christian Mysticism: Future of a Tradition,* 1986, 296

"Everything that is in the heavens, on the earth, and under the earth, is penetrated with connectedness, penetrated with relatedness."

Hildegard of Bingen in Unlein/Fox, ... in Joranson, 1982, 100.

"All of nature is joined together like a huge multi-dimensional net in which any break or tear, regardless of how innocuous or insignificant it may seem, weakens the entire ecological fabric of life."

Lutz in Joranson, 1982, 254-255

1A1 Marine Aids to Navigation with Floating and Fixed Aids Submodes with Note

12 Lighted Floating Aids
120 Standard Single Types
1200 Can
1201 Spherical
1202 Conical
1203 Pillar

13 Unlighted Buoys
130 Standard Single Forms
1300 Ogival
1301 Spindle
1302 Spherical
1303 Pillar
131 Forms with Variant Versions
1310 Conical
1311 Can/Cylindrical
1312 Spar

14 Sound Buoys
140 Single Types
1400 Bell
1401 Whistle
1402 Gong

15 Radio Buoys
150 Single Types
1500 Radar Beacon Buoy

16 Multi-Message Marine Floating Aids
160 Large Floating Aids, Single Types
1600 Light Vessels
1601 Large Navigational Buoys
161 Lighted Sound Buoys
1610 Lighted Bell Buoy
1611 Lighted Whistle Buoy
1612 Lighted Gong Buoy

21 All-lighted Marine Aids
210 Single Forms
2100 Traffic Control Signals
2101 Sector Lights
2102 High-Intensity Marine Lights
22 Lighted Fixed Aids
221 Major Structures (Lighthouses): Sea-Girt
2210 Towers on Rocks
2211 Towers on Skeleton Structures
2212 Towers on Special Marine Foundations
2213 Houses on Special Marine Foundations
222 Major Structures: Land-based Towers
2220 Tall Coastal Towers
2221 Towers on Promontories & Headlands
2222 Open Towers
223 Major Structures: Non-Towers
2230 Houses
2231 Skeleton Structures
2232 Buildings
2233 Composite Structures
224 Minor Structures

2240 Single Vertical Members (Narrow)
2241 Single Vertical Members (Broader)
2242 Multi-member Open Structures
2243 Enclosed Structures
2244 Composite Forms
2245 Single Forms

23 Unlighted Marine Fixed Aids
231 Natural Marks
2310 Cairns
2311 Trees
2312 Stone Construction
232 "Artificial" Marks
2320 Unidimensional Forms
2321 Open Structural Forms
2322 Enclosed & Solid Construction Forms
233 Morphological/Physical Forms
2330 Daymarks
2331 Daymarks & Structures

24 Fixed Fog Signals
240 Signals with Single Forms
2400 Whistle
2401 Bell
2402 Gong
2403 Reed Horn
2404 Siren
241 Signals with Variant Forms
2410 Diaphone
2411 Diaphragm Horn
2412 Explosives

25 Marine Electronic Aids
250 Electronic Aids, Single Forms with Variants
2500 Radiobeacon
251 Radar Aids
2510 Racon
2511 Ramark
2512 Radar Reflectors
252 Hyperbolic Radionavigation Systems
2520 Loran
2521 Decca
253 Satellite Navigation Aids
2530 Global Positioning System
2531 Differential GPS

"We must compare things because that is the way our brains are constituted."

J.Z. Young in Dillistone's *The Power of Symbols in Religion and Culture*, 1985, 82.

1A2 Aero Navigation Aids & Note

31 All-Lighted Aero Aids
- 311 Approach Lights
  - 3110 Unidirectional Lamps
  - 3111 Omnidirectional Lamps
  - 3112 Sequenced Flashers
- 312 Final Approach Indicators
  - 3120 Visual Approach Slope Indicators
  - 3121 Precision Approach Path Indicators
  - 3122 Pulse Light Approach Slope Indicators
  - 3123 Tri-Color Visual Approach Slope Indicators

32 Partly-Lighted Aero Aids
- 321 Runway & Taxiway Inset (Inpavement) Lights
  - 3210 Centerline Lights
  - 3211 Edge Lights
  - 3212 Cross-Runway/Taxiway) Lights
- 322 Runway & Taxiway Elevated Lights
  - 3220 Edge Lights
  - 3221 Cross-Runway/Taxiway Lights
- 323 Beacons
  - 3230 Aerodrome Beacons/Airport Beacon
  - 3231 Identification Beacon (Code Beacon)
  - 3232 Heliport Beacon
- 324 Obstruction Lighting
  - 3240 Low Intensity Lights
  - 3241 Medium Intensity Lights
  - 3242 High Intensity Lights
- 325 Wind Indicators

3250 Wind Indicators
3251 Wind Tees
3252 Landing Direction Indicators
326 Aircraft Stand Aids
3260 Manoeuvring Guidance Lights
3261 Docking Guidance Lights
327 Heliport Lights
3270 Final Approach & Take-Off Areas Lights
3271 Touchdown Lift-Off Area Lighting Systems
328 Partially-Lighted Signs

33 Unlighted Aero Navigation Aids
330 Signs-Single Forms
3330 Aerodrome Identification Signs
3331 Aircraft Stand Identification Signs
3302 Road-Holding Position Signs
331 Signs with Variant Versions
3310 Mandatory Instruction Signs
3311 Information Signs
332 Markings
3320 Longitudinal Markings
3321 Transverse Markings
3322 Graphic Markings
3323 Alphanumeric Markings
333 Obstruction Markings
3330 Patterns
3331 Spherical Markers
3332 Flags
334 Elevated Markers
3340 Painted Forms on Horizontal Objects
3341 Reflective Forms

3342 Flags
3343 Structural Forms
3344 Natural Forms
3345 Geometric Forms
335 Low-Elevation Markers
3350 Reflective Forms
3351 Natural Forms

35 Aero Radio Aids
351 Final Approach & Landing Aids
3510 ILS
3511 MLS
352 En-Route Short-Distance Aids
3520 VOR
3521 DME
3522 VORTAC
3523 TACAN
3524 Non-Directional Beacon (NDB)
3525 En-Route VHF Marker Beacon
353 Satellite Navigation Aids
3530 Global Positioning System (GPS)
3531 Differential GPS

"To Name Properly Implies Knowledge of Essence."
Bouma-Prediger, *For the Beauty of the Earth: A Christian Vision for Creation Care.* 2001, 73.

1B Surface Transportation Modes
1B1 Traffic Control Devices

41 Traffic Control Signals
411 Standard Signals
4110 Traffic Signals
4111 Pedestrian Signals
412 Special Signals
4120 Cyclist Signals
4121 Flashing Beacons
4122 Level/Grade Crossing Signals
4123 Lane Use Control Signals
4124 Movable Bridge Signals
4125 Emergency Signals
4126 Ramp-Control Signals
4127 Miscellaneous Signals
4128 Lighting Devices

42 Partially-lighted TCDs
421 Lighting Devices
4210 Warning Lights
4211 Steady-burning Electric Lamps
422 Signs [This pertains to listing of signs in unlighted classification. When lighted such signs are preceded by "4"]

43 Unlighted TCD Signs & Markings
431 Warning Signs
4310 Roadway Alignment Signs
4311 Roadway Conditions Signs
4312 Intersection Signs

4313 Intermittent Moving Hazards Signs
4314 Construction & Maintenance Signs
4315 Level/Grade Crossing Signs
4316 Other Dangers Signs

432 Regulatory Signs
4320 Priority Signs
4321 Prohibition & Restrictive Signs
4322 Mandatory Signs
4323 Standing & Parking Signs
4324 Pedestrian Crossing Signs
433 Informative Signs
4330 Distance & Direction Signs
4331 Route Markers
4332 Mile Posts
4333 Signs Giving General Information
434 Horizontal Markings
4340 Longitudinal Markings
4341 Transverse Markings
4342 Multiple-direction Markings
4343 Graphic Markings
4344 Alphanumeric Markings
435 Vertical Markings
4350 Barricades
4351 Channelizing Devices
4352 Delineators
4353 Object Markings

44 Sound Traffic Signals
440 Signals with Single Forms
4400 Movable Bridge Signals

441 Signals with Variant Forms
4410 Audible Pedestrian Signals

"Francis underwent a painful process of inner purification such that his eyes could come to see the cosmic presence of Christ and God at the center of each created thing."

Boff, *"God's Witness in the Heart of the World,* 1981, 189.

1B2 Railway Signals, Signs, Markers

51 All-lighted Railway Signals
- 511 Trackside Signals [Signals Governing Train Movements on One Track [(SGTMOOT)]
  - 5110 Color-light: Multiple-lens
  - 5111 Color-light: Searchlight-lens
  - 5112 Color-position Signal
  - 5113 Position-light Signal
  - 5114 Symbol Signals
- 512 Cab Signals
  - 5120 Color-light Signals
  - 5121 Position-light Signals
  - 5122 Numerical Signals
- 513 Dwarf Signals [Signals Governing Train Movements From One Track to Another Track (SGTMFOTTAT)]
  - 5130 Color-light: Multiple-lenss Signals
  - 5131 Color-light: Searchlight-lens Signals
  - 5132 Color-position Signals
  - 5133 Position-light Signals
  - 5134 Symbol Signals

52 Partially-lighted Railway Signals
- 521 Trackside Signals -- Semaphore
  - 5210 Blade-spectacle Fully-integrated
  - 5211 Blade-spectacle Integrated Through Linkage
  - 5212 Blade/Lens Partially Integrated
  - 5213 Blade/Lens Separate
  - 5214 Composite: Blade/Lens Integral
  - 5215 Double: Blade/Lens Integral

522 Signal Boards/ Board Signals
5220 Single-unit Signals
5221 Double-unit Signals
5222 Composite: Semaphore-signal Board
523 Dwarf Semaphore & Rotating Signals
5230 Dwarf Semaphores
5231 Disc-Open, with Signal Lamp
5232 Disc-Open, Indirectly-lighted
5233 Disc-Semaphore
5234 Pillar-Disc
5235 Miniature Graphic Symbol Indicators
524 Dwarf Revolving Signals
5240 Disc Signals
5241 Panels
5242 Graphic Symbols-enclosed
5243 Graphic Symbols-open
525 Railway Signals
5250 Single Forms, Lighted Signs

53 Unlighted Railway Signals, Signs & Markings
531 Targets & Track Indicators
5310 Color
5311 Shape
5312 Position
5313 Color-Shape
5314 Miniature Graphic Symbol Indicators
532 Signs
5320 Advance Location Signs
5321 Limit & Location Signs
5322 Territory Limits Signs
5323 Safety Signs

5325 Maintenance of Way Signs
5326 Speed Control Signs
533 Markings
5330 Plates & Flags
5331 Boards & Posts
5332 Markers & Marks
534 Fixed Unlighted Signals

54 Railway Sound Signals
540 Signals with Single Forms
5400 Detonators
5401 LC/GC Bells
541 Signals with Variant Forms
5410 Track Crew Warning Signals

55 Railway Electronic Aids
550 Radio Aids -- Single Forms
5550 Radio Token

56 Multi-message Railway Aids
561 Lighted/Sound Signals
5610 Cab Signals/Audible Cab Signals
5611 LC/GC Lighted Signals (Crossing Bells)
562 Lighted/Unlighted Devices
5620 LC/GC Lighted Signals/Unlighted Signs
5621 Barriers & Gates

"The sacramental presence of the Spirit endows all of creation with a sacred value and dignity."
Nash, *Loving Nature: Ecological Integrity & Christian Responsibility,* 1991, 115.

Note

Main, Variant & Adjunct Classifications

This edition became more difficult because of an review of the existing classifications. The main classification is seemingly competing with the adjunct classification that the Database represents along with variant classifications and older versions. The problem extends even to what terms ought to be kept. The problem is understandable: a traditional classification draws together terms of a discipline in an orderly fashion influenced by its nomenclature. While the database is often expansive in gathering terms and their meanings. Yet the latter can be regarded as an authentic classification though of a more free-form design.

The adjunct classification along with the main and variant classification can offer the beginning of an answer to the problem of correlation of multiple classifications. The three classifications can be seen as roughly on a par. The adjunct classification of the Database can be viewed as a legitimate classification though of a different character. The main classification needs to be compared with the adjunct version. And adjunct terms need to be linked to main. The variant classification also requires links to main. Admittedly, a challenge remains since the adjunct classification has many peripheral tems. Yet the end result can be a functioning multifaceted classification though lacking a high degree of precision and clarity.

An aid to a comparison of the diverse classifications is to be found in the *Composite Categories Classification & Index* of the Database: A review of differences between terms in modal monographs, classification, and database is provided for terms in the several subdivisions of Transportation-Markings.

The 2nd edition of this study included references to the adjunct classification as well as to the nomenclature in Appendices. That location may have suggested that vital information had only a peripheral significant. That material is now location in a new Chapter 4.

> "The second role of theology is an integrating discipline, settling the first-order of science, aesthetics, morality, and of religion itself, within a deeper and more comprehensive matrix of understanding. Theological meta-physics, as we may call this activity, aims to be a true 'Theory of Everything', based on the fundamental premise that the Mind and Will of a divine Agent lie behind the multi-leveled character of our encounter with reality."
>
> John Polkinghorne, *Faith, Science & Understanding,* 2000, 27-28.

CHAPTER TWO

INTERNATIONAL CLASSIFICATION

BASED ON MESSAGES ENERGY FORMS

WITH VARIANTS

"That is where Umberto Eco comes into the story. Eco is a professor of semiotics, the science of signs. We have come to think of signs as lifeless abstractions, labels assigned arbitrarily to things in the world. But in medieval times, as Eco shows in his novel *The Name of the Rose,* signs were believed to resonate with magic. With the proper incantation one could invoke the powers of the universe. As a semiotician, Eco tries to restore some of this magic to twentieth-century linguistics, showing that signs are not empty labels--mere reflections of what we think of as hard-core reality--that they form a world unto themselves, a kind of cyberspace in which they take on a life of their own. When we buy a pair of Guess jeans or a Gap T-shirt, we are not merely buying cloth cut and sewn with thread, we are buying a symbol that stands for a whole world of messages we are trying to convey."

George Johnson, *Fire in the Mind: Science, Faith, and the Search for Order,* 1995, 252-253.

"Nature in its entirety has value for God. I refer to all of nature, both the living and the non-living; the human and non-human; plants as well as animals; sticks, air, water, stones: everything."

Baer, Ecology, Religion & the American Dream, *AER*, September 1971, 47.

"Santmire's employment of the term [nature] denies any suggestion that houses automobiles, cities, and so on are 'not natural.' He deals with 'fabricated nature' as 'nature taken up into, or stamped by, the world of spirit.'"

Claude Stewart, *Natural in Grace: A Study in the Theology of Nature,* 1983, 51.

"Sensitive care means attention to the interdependence of wild, cultivated, and fabricated nature."

H.P. Santmire, *Nature Reborn: The Ecological and Cosmic Promise of Christian Theology,* 2000, 126.

2A Main Classification

2A1 Visual Forms--All-Lighted

21 All-lighted Marine Aids
- 210 Single Forms
  - 2100 Traffic Control Signals
  - 2101 Sector Lights
  - 2102 High-intensity Marine Lights

31 All-lighted Aero Aids
- 311 Approach Lamps
  - 3110 Unidirectional Lamps
  - 3111 Omnidirectional Lamps
  - 3112 Squenced Flashers
- 312 Final Approach Indicators
  - 3120 Visual Approach Slope Indicators
  - 3121 Precision Approach Slope Indicators
  - 3122 Pulse Light Approach Path Indicators
  - 3123 Tri-Color Visual Approach Slope Indicators

41 Traffic Control Signals
- 411 Standard Signals
  - 4110 Traffic Signals
  - 4111 Pedestrian Signals
- 412 Special Signals
  - 4120 Cyclist Signals
  - 4121 Flashing Beacons
  - 4122 Level/Grade Crossing Signals
  - 4123 Lane Use Control Signals
  - 4124 Movable Bridge Signals

4125 Emergency Signals
4126 Ramp-Control Signals
4127 Miscellaneous Signals
4128 Lighting Devices

51 All-lighted Railway Signals
511 Trackside Signals [Signals Governing Train Movements on One Track (SGTMOOT)]
5110 Color-light: Multiple-lens
5111 Color-light: Searchlight-lens
5112 Color-position Signal
5113 Position-light Signal
5114 Symbol Signals
512 Cab Signals
5120 Color-light Signals
5121 Position-light Signals
5122 Numeric Signals
513 Dwarf Signals [Signals Governing Train Movements One Track to Another Track (SGTMFOTTAT)]
5130 Color-light: Multiple-lens Signals
5131 Color-light: Searchlight-lens Signals
5132 Color-position Signals
5133 Position-light Signal
5134 Symbol Signals

2A2 Visual Forms--Partially-Lighted

12 Lighted Floating Aids
120 Standard Single Types
1200 Can

2242 Multi-member Open Structures
2243 Enclosed Structures
2244 Composite Forms
2245 Single Forms

32 Partly-lighted Aero Aids
321 Runway & Taxiway Inset (Inpavement) Lights
3210 Centerline Lights
3211 Edge Lights
3212 Cross-Runway/Taxiway Lights
322 Runway & Taxiway Elevated Lights
3220 Edge Lights
3221 Cross-Runway/Taxiway Lights
323 Beacons
3230 Aerodrome Beacon/Airport Beacon
3231 Indentification Beacon (Code Beacon)
3232 Heliport Beacon
324 Obstruction Lighting
3240 Low Intensity Lights
3241 Medium Intensity Lights
3242 High Intensity Lights
325 Wind Indicators
3250 Wind Indicators
3251 Wind Tees
3252 Landing Direction Indicators
326 Aircraft Stand Aids
3260 Manoeuvring Guidance Lights
3261 Docking Guidance Lights
327 Heliport Lights
3270 Final Approach & Take-off Area Lights

3271 Touchdown Lift-off Area Lighting System
328 Partially-Lighted Signs

42 Partially-lighted TCDs
421 Lighting Devices
4210 Warning Lights
4211 Steady-Burning Electric Lamps
422 Signs [Special types of signs are listed in unlighted classification; any signs that are lighted are designated by number 2 in second digit in place of number 3].

52 Partially-lighted Railway Signals
521 Trackside Signals -- Semaphores
5210 Blade-spectacle Fully-integrated
5211 Blade-spectacle Integrated Through Linkage
5212 Blade/Lens Partially Integrated
5213 Blade/Lens Separate
5214 Composite: Black/Lens Integral
5215 Double: Blade/Lens Integral
522 Signal Boards/Board Signals
5220 Single-unit Signals
5221 Double-unit Signals
5222 Composite: Semaphore-signal Board
523 Dwarf Semaphore & Rotating Signals
5230 Dwarf Semaphore
5231 Disc-Open, with Signal Lamps
5232 Disc-Open, Indirectly-lighted
5233 Disc-Semaphore
5234 Pillar-Disc
5235 Miniature Graphic Symbol Indicators

524 Dwarf Revolving Signals
5240 Disc Signals
5241 Panels
5242 Graphic Symbols -- Enclosed
5243 Graphic Symbols -- Open

525 Railway Signals
5250 Single Forms, Lighted Signs

2A3 Visual Forms--Unlighted

13 Unlighted Buoys
130 Standard Single Forms
1300 Ogival
1301 Spindle
1302 Spherical
1303 Pillar
131 Forms with Variant Version
1310 Conical
1311 Can/Cylindrical
1312 Spar

23 Unlighted Marine Fixed Aids
231 Natural Marks
2310 Cairns
2311 Trees
2312 Stone Construction
232 "Artificial" Marks
2320 Unidimensional Forms
2321 Open Structural Forms
2322 Enclosed & Solid Construction Forms

233 Morphological/Physical Forms
2330 Daymarks
2331 Daymarks & Structures

33 Unlighted Aero Navigation Aids
330 Signs-Single Forms
3300 Aerodrome Identification Signs
3301 Aircraft Stand Identification Signs
3302 Road-Holding Position Signs
331 Signs with Variant Versions
3310 Mandatory Instruction Signs
3311 Information Signs
332 Markings
3320 Longitudinal Markings
3321 Transverse Markings
3322 Graphic Symbols
3323 Alphanumeric Markings
333 Obstruction Markings
3330 Patterns
3331 Spherical Markers
3332 Flags
334 Elevated Markings
3340 Painted Forms on Horizontal Objects
3341 Reflective Forms
3342 Flags
3343 Structural Forms
3344 Natural Forms
3345 Geometric Forms
335 Low-Elevation Markers
3350 Reflective Forms
3351 Natural Forms

43 Unlighted TCD Signs & Markings
- 431 Warning Signs
  - 4310 Roadway Alignment Signs
  - 4311 Roadway Conditions Signs
  - 4312 Intersection Signs
  - 4313 Intermittent Moving Hazards Signs
  - 4314 Construction & Maintenance Signs
  - 4315 Level/Grade Crossing Signs
  - 4316 Other Dangers Signs
- 432 Regulatory Signs
  - 4320 Priority Signs
  - 4321 Prohibition & Restrictive Signs
  - 4322 Mandatory Signs
  - 4323 Standard & Parking Signs
  - 4324 Pedestrian Crossing Signs
- 433 Informative Signs
  - 4330 Distance & Direction Signs
  - 4331 Route Markers
  - 4332 Mile Posts
  - 4333 Signs Giving General Information
- 434 Horizontal Markings
  - 4340 Longitudinal Markings
  - 4341 Transverse Markings
  - 4342 Multiple-direction Markings
  - 4343 Graphic Markings
  - 4344 Alphanumeric Markings
- 435 Vertical Markings
  - 4350 Barricades
  - 4351 Channelizing Devices
  - 4352 Delineators

4353 Object Markings

53 Unlighted Railway Signals, Signs & Markings
531 Targets & Track Indicators
5310 Color
5311 Shape
5313 Color-Shape
5314 Miniature Graphic Symbol Indicators
532 Signs
5320 Advance Locations Signs
5331 Limit & Location Signs
5322 Territory Limits Signs
5323 Safety Signs
5324 Maintenance of Way Signs
5325 Speed Control Signs
533 Markings
5330 Plates & Flags
5331 Boards & Posts
5332 Markers & Marks
534 Fixed Unlighted Signals

2A4 Acoustic Aids

14 Sound Buoys
140 Single Types
1400 Bell Buoy
1401 Gong Buoy
1402 Whistle Buoy

16 Multi-Message Marine Floating Aids
161 Lighted Sound Buoys

1610 Lighted Bell Buoy
1611 Lighted Whistle Buoy
1612 Lighted Gong Buoy

24 Fixed Fog Signals
240 Signals with Single Forms
2400 Whistle
2401 Bell
2402 Gong
2403 Reed Horn
2404 Siren
241 Signals with Variant Forms
2410 Diaphone
2411 Diaphragm Horn
2412 Explosives

44 Sound Traffic Signals
440 Signals with Single Forms
4400 Movable Bridge Signals
441 Signals with Variant Form
4410 Audible Pedestrian Signals

54 Multi-message Railway Aids
540 Signals with Single Form
5400 Detonators
5401 LC/GC Bells

56 Multi-message Railway Aids
561 Lighted/Sound Signals
5610 Cab Signals [Audible Cab Signals]
5611 LC/GC Lighted Signals [Crossing Bells]
562 Lighted/Unlighted Devices
5620 LC/GC Lighted Signals/Unlighted Signs
5621 Barriers & Gates

2A5 Electronic Forms

15 Radio Buoys
150 Single Types
1500 Radar Beacon Buoy

25 Marine Electronic Aids
250 Electronic Aids, Single Form with Variants
2500 Radiobeacon
251 Radar Aids
2510 Racon
2511 Ramark
2512 Radar Reflectors
252 Hyperbolic Radionavigation Systems
2520 Loran
2521 Decca
253 Satellite Navigation Aids
2530 Global Positioning System
2531 Differential GPS

35 Aero Electronic Navigation
351 Final Approach & Landing Aids
3510 ILS

3511 MLS
352 En-Route Short-Distance Aids
3520 VOR
3521 DME
3522 VORTAC
3523 TACAN
3524 Non-Directional Beacon (NDB)
3525 En-Route: VHF Marker Beacon
353 Satellite Navigation Aids
3530 Global Positioning System (GPS)
3531 Differential GPS

55 Railway Electronic Aids
550 Radio Aids - Single Forms
5500 Radio Token

"How can I write six-foot verses when surrounded by seven-foot barbarians?"
Sidonius Appolliaris
(5th century Bishop)
Geraldine Hodgson,
English Mystics, 1973, 56

2A6 Notes for Chapter 2

21 All-lighted Marine Aids. While most marine aids to navigation are not continuously lighted there are some aids of more recent vintage that have such capability. The lst ed contained one such aid, two more were added in the 2nd ed. Pharos Marine, a major aids source, provides the information which reflects IALA/IALP guidelines to some degree.

311 Approach Lamps. Only primary forms are listed in the main classification. The variant classification now encompasses detailed forms that had been in the lst ed are now in variant classification. General terms (3122 and 3123) are in main with specific forms in the variant classification. 3123 was not included in the lst ed.

3212, 3221 An earlier attempt was made to pull together similar aids. The term transverse (TCD) was added for Runway and Taxiway Lights. That unfamiliar term is omitted while cross-runway is retained.

327 Heliport terms are included though specialized. 1994 edition added terms to runway and taxiway aids. Yet heliport configurations are at variance with standard navigation. Possibly the terms tend toward the variant.

4120 Cyclist Signal. This refers to UN 1968 signal for use of cyclists. Term is descriptive since UN does not so name the signal. This and other notes from the 2nd ed are

retained in this edition.

4124, 4125, 4128 Movable Bridge Signals, Emergency Signals, Lighting Devices. These signals were not included in the lst ed though in use at the time.

4126, 4128, Ramp-Control Signals, Miscellaneous Signals. These devices are added in the 3rd edition. The source is the 2nd edition of the TCD study (2004) which has a revised classification superseding that of Part H for a variety of TCD terms.

511 Trackside Signals. Part F employed an alternate formulation for mainline signals: Signals Governing Train Movements on One Track [SGTMOOT]. That phrase does not indicate whether signals were full-size or dwarf. The phrase is not only precise but also presents a cumbersome appearance. The older term is therefore reintroduced.

5110, 5111 There are two forms of Color-Light Signals. Possibly only one form should appear here with specific versions in variant classification. However, both are major forms and retained here.

5114, Symbol Signals. lst ed has graphic and alphanumeric symbol forms but those designations are assigned to the variant classification with a general term employed here.

512, Cab Signals. These signals were attached to mainline signals in the lst ed. But cab signals are now given a separate listing. Possibly the principal forms of these

signals might be assigned to the variant classification though a decision was made to list them here. Entries are inaccurate for Cab Signals: Color-position should be Color-light; Position are to be Position-Light; Alphanumeric should be altered to Numeric.

513, Dwarf Signals. This traditional term replaces a term coined for Part F: Signals Governing Train Movements From One Track to Another Track [SGTMFOTTAT]. Comments for 511 have application.

12 & 22 are unchanged from the lst ed.

321 & 322. A more physical, less morphological format has been adopted here. Runway and taxiway light forms have been merged.

3230 Airport Beacon added to Aerodrome Beacon. The second term may have international status yet the former term is widely employed and needs to be included

3232 Heliport Beacon was inadvertently omitted from 2nd ed. Location of aid uncertain. It is possibly a main term though variant is plausible since it is a somewhat restricted term. However, it is placed in main classification.

3251, Wind Tee. This is an older and obsolescent aid. It was omitted in lst ed but added here since it continues to find some usage.

326, Aircraft Stand Aids. The older name of Parking and

Docking Aids has been changed since both forms refer to aircraft stand situations. The terms are morphological though also containing a physical dimension.

327, Heliport Lights. One aid, aiming point lights, has been moved to partially-lighted since it consists of an unlighted triangle augmented by appropriate light units.

328, Partially-lighted Signs. This pertains to signs in unlighted classification when lighted. Such signs, when lighted, begin with "3" rather than "4". The special dual classification in lst ed is replaced by separate though interrelated classifications.

42, Partially-lighted TCDs. The lst ed did not include this segment though some forms existed at that time. Lighted signs had been in the specific dual classification while lighting devices were altogether omitted.

512, Cab Signals. Terms altered for types of signals.

521, Trackside Signals-Semaphores. Comments on reintroducing trackside is taken up in all-lighted, 512.

5210, Blade-spectacle Fully-integrated. UQ and LQ forms are now in variant classification.

5220, Single-unit Signals. Specific forms are now in variant classification.

522, Signal Boards/Board Signals and equivalent terms.

The matter may be more significant. 2nd ed placed it in a subordinate positions.

523, Dwarf Semaphore & Rotating Signals. The term dwarf is reintroduced here as was done in adjoining segments.

5230, Dwarf Semaphores. UQ & LQ forms are now variants.

5231 and 5252. Perhaps these forms are not sufficiently differentiated to quality as main entries in this classification. Yet they may be sufficiently different to quality as entries in the main classification.

524, Disc Signals. Individual forms formerly included are now variants.

5250, Lighted Signs. Unlighted signs with a lighted dimension assigned to this classification designation.

13 and 23. The lst edition employed an older and unrevised version of the classification that employed the number 4 for unlighted aids. The accompanying three and four-digit designation are also affected.

3212 & 3222. The term transverse had been borrowed from TCD; This idea has been dropped. It brings together a variety of aids that display cross-runway and -taxiway lights. Specific forms are now in the variant classification.

33, Unlighted Aero Navigation Aids. This segment has

undergone a substantial overhaul. The terms are now more physical in nature. And markings and signs listed under marker are so designated. The accompanying database entries also underwent substantial revision thereby better reflecting unlighted aero aids.

330, 331, 332, Signs. In the lst ed these were in a special dual classification outside of the unlighted aids categories. They are now rejoined to other unlighted aids. Partially-lighted categories include a lighted signs heading which is to be applied to signs when lighted.

421, Lighting Devices. Two of these forms are partially-lighted while two other forms are all-lighted. Possibly specific forms should be seen as variants though the forms have distinct appearances.

422, Signs. Signs are classified by forms in the unlighted segments. This truncated segment refers to those signs that have a lighted dimension. Such signs are preceded by a "4" instead of a "5."

4316, Other Dangers Signs. Part E, 2004, moved this sign from variant to the existing main classification.

4333, Signs of General Interest altered to Signs Giving General Information. Database supplies this term.

431, Warning Signs. This segment has been overhauled. It reflects Canadian practice which offers a better organization for these aids. It is also employed in the Database.

432, Regulatory Signs. Several forms in the lst ed have been moved to the variant classification thereby reducing specific forms and introducing general groups for main.

433, Informative Signs. Specific forms have been moved from this segment to variant classification and main forms are in now more general groupings.

434, Horizontal Markings. This segment replaces four segments in lst ed. Many entries -- often morphological in nature -- are now in variants.

435, Vertical Markings. This is a new segment. Only one four-digit entry was included in the lst ed. That entry, obstacle markings, is now termed object markings.

532, Signs. lst and 2nd editions included eight subdivisions based on 1991 railway signal study. Categories are reduced to five in this edition. This arrangement reflects a schema developed from the Database.

531, Targets. Camp 1903 speaks of three kinds of targets. All are position in some sense. However, position specifically refers to a one-vane target. The other terms can be separate though often Color and Shape are together.

5314, Miniature Graphic Symbol Indicators. This term is a functional description of several forms of devices also known as Track Indicators. The second term encompasses specific titles.

532-533 are reduced to one category in this edition. Signs Other Than Speed Regulations are merged with Speed Signs. 11 3-digit categories are reduced to five. This reflects the organization of signs in the Database. The older schema stems from the 1991 railway signal study. More sign forms are now in variant classification.

534, Signs Under Other Names category is merged with Markings into a new category. These "signs" often had limited alphanumeric characters. Many are termed Plates and this distinguished them from more conventional signs. Database categories of Plates and Flags, Boards and Posts replace that category and merge with the older Markings category (now 533). There are substantial entries in variants.

534, Fixed Unlighted Signals. This category first appeared in 2003. No subdivisions are provided. Fixed in this instance refers to messages that are fixed. A permanent caution signal would be one example of the device.

535, Movable Signals. These aids were included in the 2nd ed. but only in variant classification. They include two very different componets: 5350, Staff, Ticket, Tablet &Token, 5351, Train Order & Time Interval. The category term encompasses the former segment more precisely than the latter.

14, Sound Buoys. The lst ed designated these aids under the number 15 which was correct for an older version of the

classification though not in the revised version.

1402, Gong Buoy. This aid has been added here since it remains important though geographically restricted.

16, Multi-message Marine Floating Aids. This category encompasses combination aids. These aids are now located with mode-specific forms since there are few entries to make up an entire inter-modal combination aids category. They include 160, Large Floating Aids, Single Types, and 161, Lighted Sound Buoys. 160 had formerly been in a special combination aids group though not 161. These aids, of course, are lighted aids as well as sound aids. 1600, Light Vessels are retained though most traditional forms are extinct. Some newer variant forms are in use. Large Navigational Buoys, 1601, is relatively new yet phased out as well. They are retained in this edition.

24, Fixed Fog Signals. Several forms have been added to those listed in the lst ed. Those forms are only infrequently used yet included by some relatively new reference. It is possible that an archaism segment in the variant classification may be required for any future edition for diverse T-M forms. 24 was designated as 25 in the lst ed reflecting an older classification nomenclature.

44, Sound Traffic Signals. This segment was absent from the lst ed. However, Part J includes a broad range of sound signals thereby influencing this category.

54, Railway Sound Signals. Comments for 44 apply here.

LC/GC Bells, 5401, added to category. Only bells employed at crossing.

56, Multi-message Railway Aids. This segment was added to 2nd ed. But only lighted/sound devices included. Lighted and unlighted devices (5620) added including barriers and gates which contain several dimensions (5621). 561, Lighted/Sound Signals. This segment includes two very different aids: 5610, Cab Signals [Audible Cab Signals], and 5611, LC/GC Signals [Crossing Bells].

1500, Radar Beacon Buoy is added to this classification.

2500, Radiobeacons. This aid is retained though it is extinct save as a DGPS service. The phasing out of the aid begain in 1993 and ended in 2000. In 1999 there were four units in service versus more than 200 stations at an earlier stage. The main entry and variant entries are retained because of recent usage. Several formerly listed forms are now relocated in variant classification.

353 En-route Hyperbolic Aids have been moved to variant classification since remaining hyperbolic aids are marginal or obsolete.

2522. Omega is now in the variant classification. That service ended in the late 1990s. It is included because it was a relatively recent aid.

2523. Consol. This aid is also in variant classification. There may have been one remaining station in the 1980s. It

is also retained because it was a somewhat recent aid.

2531, DGPS. This is added as a main form since it has considerable significance in navigation itself.

35, Aero Electronic Navigation Aids. This category has undergone a major overhaul. "Homemade" headings in lst ed are dropped in favor of more conventional headings. The 2nd ed is influenced by the Database.

3510, ILS and 3511, MLS. Components of these aids are listed in the variant classification in contrast to the lst ed.

3540, GPS, and 3541, DGPS. These entries parallel marine use and could conceivably share a common numeration.

55, Railway Electronic Aids. The lst ed lacked this segment. Numerous terms seemingly describe a single aid: for this category. It is often known as a radio or electronic block.

> "Hopkins was overcome all his life with 'despair at the multiplicity of phenomena unexplained and unconnected.'"
>
> Sulloway, *Gerald Manley Hopkins & the Victorian Temper.* 1972, 90

2B Alternate Classifications

Two alternate classifications accompany the international classification based on energy forms. The first of these (2B1) closely follows the first classification though in a schematic formulation rather than in an outline form. Transportation modes as well as energy forms shape its construction.

The second alternate classification is based on the nature of message placed within a matrix numbered entities undergirded by a foundation of energy and mode forms.

These classification are alternate classifications rather than variants. They contain the same material though in different configurations.

> "Even the most material of realities. in his [Teilhard] view, have some consciousness, however diffuse. A pebble, for example, has a 'within,' however inert it might appear."
>
> H.P. Santmire, *Nature Reborn: The Ecological and Cosmic Promise of Christian Theology*, 2000, 48.

2B1 Schematic Classification

	MARINE	AERO	ROAD	RAIL
ALL-LIGHTED	210 2100 2101 2102	311 3110 3111 3112 312 3120 3121 3122 3123	411 4110 4111 412 4120 4121 4122 4123 4124 4125 4126 4127 4128	511 5110 5111 5112 5113 5114 512 5120 5121 5122 513 5130 5131 5132 5133 5134
PARTLY-LIGHTED	120 1200 1201 1202 1203 221 2210 2211 2212 2213 222 2220 2221 2222	321 3210 3211 3212 322 3220 3221 323 3230 3231 3232 324 3240 3241 3242	421 4210 4211 422	521 5210 5211 5212 5213 5214 5215 522 5220 5221 5222

	MARINE	AERO	ROAD	RAIL
PARTLY-LIGHTED	223 2230 2231 2232 224 2240 2241 2242 2243 2244 2245	325 3250 3251 3252 326 3260 3261 327 3270 3271 328		523 5230 5231 5232 5233 5234 5235 524 5240 5241 5242 5243 525 5250
UNLIGHTED	130 1300 1301 1302 1303 231 2310 2311 2312 232 2320 2321 2322	330 3300 3301 3302 331 3310 3311 332 3320 3321 3322 3323 333 3330 3331 3332	431 4310 4311 4312 4313 4314 4315 4316 432 4320 4321 4322 4323 4324 433 4330 4331 4332 4333	531 5310 5311 5312 5313 5314 532 5320 5321 5322 5323 5324 5325 5326

	MARINE	AERO	ROAD	RAIL
UNLIGHTED		334 3340 3341 3342 3343 3344 3345 335 3350 3351	434 4340 4341 4342 4343 4344 435 4350 4351 4352 4353	533 5330 5331 5332 534
ACOUSTIC	140 1400 1401 1402 240 2400 2401 2402 2403 241 2410 2411 2412		440 4400 441 4410	540 5400 5401 541 5410

	MARINE	AERO	RAIL
COMBINATION	160 1600 1601 161 1610 1611 1612		561 5610 5611 562 5620 5621
ELECTRONIC	150 1500 250 2500 251 2510 2511 2512 252 2520 2521 253 2530 2531	351 3510 3511 352 3520 3521 3522 3523 3524 3525 353 3530 3531	550 5550

2B2 Alternate Classification: International Classification Within Matrix of Nature of Messages

This classification is based on the nature of messages found in the subject monographs. Messages are arranged according to the form of energy and by modes. It assigns a category to each marking. The classification employs a number-only designation though the letter and word designations originally employed can be substituted.

The formulation includes:

1. for changing messages
2. for unchanging
3. for multiple messages
4. for single messages.

Two digit indicators include 14 denoting changing yet single messages (CMSM). 14 is divided into 14.1 for unitary messages, and 14.2 for variable messages. 13 indicates changing message, multiple message (C3M). 24 denotes unchanging message with single message (UMSM); 23 denotes unchanging message with multiple messages (U3M). 23 has two subforms: a basic bifurcation into programmable markings (.1), and unitary markings (.2). Unitary exhibits one of three subdivisions: variant A (23.2.1) which admits of no variations; variant B (23.2.3) can display one of several predictable forms; variant C (23.2.3) can accept any number of forms. This results in these possible designations for the classifications: Type 13, Type 14, and Type 23 divided into 23.1, and 23.2.1, 23.2.2,

and 23.2.3.

A summary of this classification has this appearance:

1 = Changing Message (CM)
2 = Unchanging Message (UM)
3 = Multiple Message (MM)
4= Single Message (SM)

13 C3M (alternate formulation: CMMM)
14 CMSM
14.1 = Unitary
14.2 = Variable
23 U3M (UMMM)
24 UMSM
Programmable 24.1
Unitary 24.2
subforms:
Variant A 24.2.1
B 24.2.2.
C 24.2.3

Type 13:
326
411
4120
4123
440
441
2100
511
512

513
521
522
523
524
531
536

Type 14.1:
4121 (Partial; see also Type 23)
4122

Type 14.2:
4121 (Partial)

Type 23
161
4121 (Partial; see also Type 14.1)

Type 24.1

120
221
224
250
251
311

322
323
324
325
327
240
241
351
352
4315*
550

Type 24.2.2.
330
331
332
333
334
335
431*
432
433**
434
435

Type 24.2.3

328
422

3311
433
4333**
525
532

*denotes an entry in 431 that is in a different category.
** denotes an entry in 433 that is in a different category.

> "There's a general attitude that I've insisted on having, that machines are said and pitiful creatures also, and deserve a lot of compassion and help ... . An attitude of superiority and hostility toward machines is just going to be bad luck for human beings, and it isn't going to help machines achieve their fullest potential either."
>
> Gary Snyder in Thompson, *Outside,* November 1993, 62.

CHAPTER THREE

VARIANT CLASSIFICATIONS

"Just as matter and energy affect each other through the law of physics, signs affect signs--perhaps through the laws of semiotics. To a semiotician, signs like matter and energy, are not human artifices but an integral part of the world. Perhaps this is just another way of saying that information is physical, a necessary ingredient for carving up the universe."

Johnson, *Fire in the Mind: Science, Faith, and the Search for Order,* 1995, 253.

"But we know him from the arrangement of everything, because everything is, in a sense, projected out from him, and this order possesses certain images and semblances of his divine paradigms."

Pseudo-Dioynisus, *The Complete Works,* 1987 edition, 108.

"It is clear that sacraments can indeed help us to understandard and revere the giftedness and dignity of materials things. This view was expressed powerfully by John Damascene: 'I honor all matter and venerate it. Through it, filled as it were with a divine power and grace, my salvation has to come to me ... . Is not the blessed table matter which gives us the bread of life? Are not the gold and silver matter out of which crosses and altarplates and chalices are made? And before all these things is not the body and blood of our Lord matter?'

Hill, *Christian Faith and the Environment: Making Vital Connections,* 1998, 130.

"For persons engaged in scientific or scholarly fields, there is a readiness and a desire to understand the real order of all things. One knows that God has ordered the universe, but this order is still rather elusive. A lifetime uncovering this order is recognized as a worthwhile expression of divine faith, charity hope."

Tad Dunne, *Longergan & Spirituality: Towards Spiritual Integration,* 1985, 139.

Chapter 3A Aids for Water & Air Transportation

3A1 Marine Aids to Navigation

12 Lighted Buoys; 13 Unlighted Buoys; 14 Sound Buoys; 15 Radio Buoys; 16 Combination Buoys

.1 Floating Aids
.10 Lighted Buoys-National Models
.100 Canada
.101 US
.102 Greece A/Thailand A
.103 Russia
.104 Thailand B
.105 Greece B
.106 Norway
.107 Germany (Beacon Buoy, Laterial & Cardinal)
.108 All-lighted High Intensity Forms
.11 Unlighted Buoys: Conical
.110 US (Nun Form)
.111 Denmark A
.112 Denmark B
.113 Italy
.114 Poland & France
.115 Canada
.12 Unlighted Buoys: Can/Cylindrical
.120 US
.121 Denmark
.122 Germany
.123 Taiwan

.124 Sweden, Russia
.125 Canada
.13 Unlighted Buoys: Spars
.130 Modified Standard, US
.131 Modified Standard, Norway
.132 Modified Standard, Canada
.133 Special, Spar on Can Base, Iceland, *et al.*
.134 Special, Spar on Modified Can Base, The Netherlands, Poland
.135 Special, Spar on Conical Base-A, Iceland
.14 Miscellaneous Unlighted Buoys
.140 Beacon Buoy, Germany (Lateral & Cardinal)
.141 Barrel Buoys, Sweden, Russia
.142 Oil Drum Buoy, US
.143 Cask
.15 Sound Buoys
.150 Bell, US
.151 Whistle, US
.152 Carillon, France
.153 Bell, France
.154 Horn Buoy
.155 Siren Buoy
.16 Combination Buoys: Lighted Sound
.160 Lighted Bell, Canada
.161 Lighted Whistle, Canada
.162 Lighted Bell, US
.163 Lighted Whistle, US
.164 Lighted Gong, US
.165 Lighted Horn, US
.166 Lighted Bell--Can, USB
.167 Lighted Bell--Conical, USB

.168 Lighted Bell--Spherical, USB
.17 Electronic Buoys
.170 Radar Beacon Buoy
.171 Radio Beacon Buoy
.18 Multi-Message Floating Aids
.180 Lightfloats
.181 Lighted Catamarans

22 Fixed Lights & 23 Daybeacons
221-223, Major Lights; 224 Minor Lights; 231 & 232 Daybeacons

.2 Fixed Aids
.20 Major Lights (Lighthouses)
.200 Towers on Skeleton Structures: Screw-Pile Towers
.201 Towers on Skeleton Structures: Off-Shore Platforms
.202 Skeleton Towers
.203 Framework Towers
.204 Composite: House on Structure
.205 Composite: Tower Attached to House/ Building
.206 All-Lighted High Intensity Forms

.21 Minor Lights: Multi-Member Structures
.210 Tripod
.211 Pyramid
.212 Pile Structure: Marine Site
.213 Pile Structure: Land-based Site
.214 Skeleton Structure

.215 Dolphin
.216 Tripodal Tower
.217 Tubular Tower
.218 Skeleton Tower

.22 Minor Lights: Single-Member Structures I (Narrow Configurations)

.220 Spindle
.221 Spar
.222 Pipe
.223 Post
.224 Pole
.225 Single Pile
.226 Stake
.227 Mast
.228 Buoyant Beacon

.23 Minor Lights: Single-Member Structures II (Wide Configurations)

.230 Column
.231 Pedestal
.232 Pillar
.233 Pylon
.234 Obelisk

.24 Minor Lights: Enclosed, Solid & Composite Structures

.240 Hut
.241 Small House
.242 Cairn
.243 "Beacon"
.244 Cylinder
.245 House/Hut on Structure
.246 House/Hut on Pile Structure

.247 House/Hut on Tripod

.25 Minor Lights: Single Types of Structures
.250 Stand
.251 Arm
.252 Lighted Bank
.253 All-Lighted High Intensity Forms
.254 All-Lighted Range/Leading Lights
.26 Daybecons: Natural Marks
.260 Cairn
.261 Small Tree/Petit Arbre
.262 Tree Branch: Natural State
.263 Tree Branch: Tied-Down Branch
.27 Daybeacons: Unidimensional Marks
.270 Spindle
.271 Perch/Pole
.272 Pile
.273 Post
.274 Stake
.275 Edgemark
.28 Daybeacons: Open Structures
.280 Dolphin/Multiple Pile
.281 Tripod
.282 Latticework
.283 Skeleton Tower
.284 Wooden Framework
.285 Beacon/Bake, Germany
.286 Pyramidal Structures
.287 Triangular Structures
.29 Enclosed & Solid Structures
.290 Small House

.291 Enclosed Structures
.292 Stone/Masonry Structures

24 Acoustical Signals

.3 Fog Signals
.30 Diaphone
.300 Regular
.301 Two-Tone
.31 Diaphragm
.310 Compressed Air
.311 Oscillator
.312 Nautophone
.313 Chime
.32 Explosive Signals
.320 Explosives
.321 Gun
.33 Submarine Signals
.330 Submarine Bell
.331 Submarine Oscillator

25 Electronic Aids

.4 Electronic Aids
.40 Radiobeacons
.400 Non-Directional: Circular, Omni-Directional
.401 Non-Directional: Sequence, Group
.402 Non-Directional: Continuous
.403 Directional: Sequence, Group
.404 Directional: Continuous
.41 Radar Aids, Passive Forms, Reflectors

.410 Corner Reflector, Trihedral
.411 Corner Reflector, Pentagonal
.412 Corner Reflector, Octahedral
.413 Dielectric
.414 Dihedral
.415 Luneberg
.42 Ground- & Spaced-Based Hyperbolic Systems
.420 Loran-A
.421 Dectra
.422 Toran
.423 Consol
.424 Transit
.425 Omega

"The vision of God is glimpsed within the world of matter."
Leech, *The Social God*, 1981, 55.

"Each truth is a fragment which does not stand alone but reveals connections on every side."
Sertillanges, *The Intellectual Life: It's Spirit, Conditions, Methods*, 1946, 30.

31 All-lighted Aids
311 Approach Lights & 312 Final Approach Lights

.1 Light Fixtures/Functions/Systems: Approach
.10 Approach Light Equipment
.100 High Intensity Unidirectional Lamp (Halogen, Par 56)
.101 Medium Intensity Omnidirectional Elevated Lamp (Halogen, Par 38)
.102 Low Intensity Omnidirectional Elevated Lamp (Halogen)
.103 Omnidirectional Flashing Lamp
.104 Unidirectional Flashing Lamp
.11 Flashing Lights by Function
.110 Runway Threshold Identification Lights (RTILS)
.111 Runway End Identification Lights (REILS) (Omnidirectional, Unidirectional)
.112 Runway Identification Lights (RILS)
.113 Runway Alignment Identification Lights (RAILS)
.114 Lead-In-Lights (LDIN)
.12 Approach Lighting Systems: ICAO & NATO
.120 Simple Approach, ICAO
.121 Precision, Category I
.122 Precision, Categories II & III
.123 Approach Lighting, Type I, NATO
.124 Approach Lighting, Type II, NATO

.125 Military CAT II Lighting, NATO
.126 Heliport Lighting Approach System
.13 Approach Lighting Systems: US FAA
.130 ALSF-I
.131 ALSF-II
.132 SSALS
.133 SSALR
.134 ODALS
.135 MALSR
.136 MALSF

.2 Light Fixtures/Functions/Systems: Final Approach
.20 Final Approach Equipment: Color Coding: 2-Color
.200 APAPI (2-Color/1 Projector)
.201 H-PAPI (2-Color/1 Projector)
.202 Mini-PAPI (2-Color/1 Projector)
.203 AVASIS (2-Color/2 Projector, 4 versions)
.204 SAVASIS (2-Color/2 Projector)
.205 3-Bar AVASIS (2-Color/2 Projector)
.206 2-Bar VASIS
.207 3-Bar VASIS
.21 Final Approach Equipment: Color-Coding: Tri-Color
.210 CHAPI (Tri-Color/1 Projector)
.211 Glide Path Indicator (Tri-Color/1 Projector)
.212 T-PASI (Tri-Color/1 Projector)
.213 Angle of Approach Indicator (Tri-Color/1 Projector)
.22 Final Approach Equipment: Pattern, & Pulse Coding

.220 AT-VASIS (Pattern)
.221 HELI-PLASI (Pulse)
.222 HAPI-PLASI (Pulse)
.223 T-VASIS
.224 Optical Localizer (Pulse)
.225 Approach Azimuth Guidance System (SAGA) (Pulse)

.23 Final Approach Equipment: Alignment
.230 Mirror Deck Landing Systems (Alignment)
.231 Fresnel Lens Optical Landing System (Alignment)
.231 Glissada (Alignment)

32 Partially-Lighted
320 & 322 Runway & Taxiway Lights; 323 Beacons; 324 Obstruction Lights; 325 Indicators

.2 Light Fixtures (Selective Coverage)
.30 Taxiway Inset (Inpavement) Lights
.300 Straight Sections & Caution Bars (Bidirectional/Unidirectional) (Category III & Other Than Cat III)
.301 Intersections (Bi/Uni) (Category III & Other Than Cat III)

.31 Elevated Lights
.310 Runway Edge (VFR, NP IPR, & P IFR)
.311 Threshold/End (VFR, NP IFR, & P IFR)

.32 Aerodrome Beacon Lights
.320 Medium Intensity
.321 High Intensity

.33 Obstacle/Obstruction Lighting

.330 Low Intensity Light (Incandescent Bulb, External Lens)
.331 Low Intensity Light (Incandescent Bulb, Internal Lens)
.332 Low Intensity (Mercury Bulb, External Lens)
.333 Low Intensity (Neon Tube, No Lens)
.334 Medium Intensity Light (Fresnel Double Drum Lens)
.335 Medium Intensity Light (Multi-Code Cathode Tubes & Reflectors)
.336 Medium Intensity (Strobe Lights, Helical)
.337 Medium Intensity (Strobe Lights, Linear Flashtube)

.34 Docking Guidance Systems
.340 Numeric, Signal & Graphic Forms
.341 Alpha, Signal & Graphic Forms

.35 Vertiport Lighting
.350 Identification Beacon
.351 FATO Lighting
.352 TLOF Lighting

.36 Runway & Taxiway Cross-Way Lights
.360 Stop Bar Light
.361 Stopway Light
.362 Clearance Bar Light

43 Unlighted Aids

430 Signs-Single Forms, 331 Signs with Variant Versions, 332 Signs Under Heading of Marker-Single Forms, 333 Markings, 334 Markings Under the Name of Markers-Single Forms, 337 Elevated Markers, 338 Low-elevation Markers

.4 Signs

.40 Mandatory Instruction Signs

.400 Runway Designation Signs

.401 Cat I, II, III Holding Position Signs

.402 Runway-Holding Position Signs

.403 Road-Holding Position Signs

.404 No Entry Signs

.41 Information Signs

.410 Direction Signs

.411 Location Signs

.412 Destination Signs

.413 Runway Exit Signs

.414 Runway Vacated Signs

.415 Intersections Take-Off Signs

.42 Signs Under Heading of Marker

.420 Air (Roof) Marker

.421 Aircraft Arresting Marker

.422 Distance Marker

.423 Distance-to-go Marker

.424 Landscape Marker

.425 Painted Highway Marker

.426 Safe Heading Marker Board

.427 Taxiway Ending Marker

.428 VOR Check-Point Marker

.5 Markers

.50 Elevated Natural Markers

.500 Evergreen Trees

.501 Stones

.502 Hedges

.503 Flower Beds

.51 Elevated Assembled Markers

.510 Cones

.511 Cylindrical Markers

.512 Fences

.513 Flags

.514 Half Drums

.515 Plane Markers

.516 Tripods

.517 Vee Boards

.518 Vertical Boards

.52 Low Elevation Markers

.520 Bidirectional Reflective Markers

.521 Unidirectional Reflective Markers

.522 White Stones

.523 Concrete Slab

.6 Markings

.60 Runway Surface Markings

.600 Aiming Point Markings

.601 Centerline Markings

.602 Chevron Markings

.603 Designation Markings

.604 Edge Markings

.605 Shoulder Markings

.606 Side Stripes Markings

.607 Threshold Markings

.608 TDZ Markings

.61 Taxiway Surface Markings

.610 Holding Position Markings

.611 Centerline Markings

.612 Edge Markings
.613 Shoulder Markings
.62 Other Surface Markings
.620 Blast Pad & Over-Run or Stopway Markings
.621 Closed Markings
.622 Fixed Distance Markings
.623 Geographic Position Markings
.624 Segmented Circle Markings
.625 Vertiport Markings
.626 Heliport Markings
.63 Surface Markings Under Heading of Marker
.630 Limed Marker
.631 Heliport Air Marker
.632 Taxiway Holding Position Marker
.633 Threshold Marker
.64 Markings Under Name of Marker - Single Forms
.640 Barrier-Engagement Markers
.641 Fixed Distance Marker
.642 Runway Touchdown Zone Marker
.643 Aiming Marker for Turbojet Operations

.7 Radio Aids
.70 Hyperbolic Aids
.700 Loran-C
.701 Decca
.702 Consol

"The sacramental presence of the Spirit endows all of creation with a sacred value and dignity."
Nash, *Loving Nature: Ecological Integrity & Christian Responsibility,* 1991, 115.

Chapter 3B Aids for Surface Transportation

Chapter 3B1 Traffic Control Devices

1 All-Lighted Signals
412 Flashing Beacons

.1 Traffic Signals
.10 Traffic Beacons (Flashing)
.100 Hazard Identification Beacon (Warning)
.101 Speed Limit Beacon
.102 Intersection Control Beacon
.103 Stop Sign Beacon
.11 Lighting Devices
.110 Flashing Warning Beacon
.111 Steady-Burning Electric Lamp
.112 Warning Lights (3 Forms)
.12 In-Roadway Lights
.13 Miscellaneous Signals
.130 Ferry-boat Landing Signals
.131 Low-Flying Aircraft Signals

43 Unlighted Signs
431 Warning Signs; 432 Regulatory Signs;
433 Informatory Signs

.2 Signs & Markings
.20 Warning Signs: Roadway Alignments &
Roadway Conditions
.200 Crosswinds

.201 Bends (Four Versions)
.202 Descent (Ascent)
.203 Swing Bridge
.204 Roads Leading Onto Quay or River Bank
.205 Uneven Road
.206 Slippery Road
.207 Loose Gravel
.208 Falling Rocks
.209 Carriageway Narrows

.21 Intermittent Moving Hazards Signs
.210 Pedestrian Crossing
.211 Children
.212 Cyclists Entering or Crossing
.213 Cattle or Animal Crossing
.214 Aircraft Crossing
.215 Two-way Traffic

.22 Warning Signs: Railway (Level/Grade) Crossings
.220 Warning of Level Crossing with Gates or Half-Gates
.221 Warning of Other Level Crossings (Two Forms)
.222 Warning of Intersection with Tramway Line
.223 Signs to be Placed in the Immediate Vicinity of Level Crossings (Three Forms)
.224 Additional Signs at Approaches to Level Crossings (Three Forms)
(E '04: One Sign, Two Models)

.23 Regulatory Signs: Prohibitory & Restrictive
.230 No Entry (Two Forms)
.231 Closed to all Vehicles in Both Directions
.232 Entry Prohibited for Category of User or

Vehicles (Ten Forms)
.233 Entry Prohibited for Several Categories (Several Categories) (E '04: Forms)
.234 Entry Prohibited for Vehicles Whose Weight or Dimensions Exceed Certain Limits (Five Forms)
.235 Distance Between Vehicles
.24 Prohibitory & Restrictive Signs: Other Forms
.240 Prohibition of Turning (Two Forms)
.241 Overtaking Prohibited (Two Forms)
.242 Overtaking by Goods Vehicle Prohibited (Four Forms)
.243 Speed Limits
.244 Use of Audible Warning Devices Prohibited
.245 Prohibition of Passing Without Stopping
.246 End of Prohibition or Restriction
.247 End of Particular Prohibition (Two Forms)
.248 Prohibitive & Restricting Standing & Parking Signs
.25 Mandatory Signs
.250 Direction to be Followed
.251 Pass This Side
.252 Compulsory Roundabout
.253 Compulsory Cycle Track
.254 Compulsory Foot-Path
.255 Compulsory Track for Riders on Horseback
.256 Compulsory Minimum Speed
.257 End of Compulsory Minimum Speed
.258 Snow Chains Compulsory
.26 Horizontal Markings: Longitudinal & Transverse Forms

.260 Traffic Lane Markings
.261 Continuous Lines for "Particular Situations"
.262 Carriageway Limit Lines
.263 Obstruction Markings
.264 Guide Lines for Turning Vehicles
.265 Stop Lines
.266 Yield Lines
.267 Pedestrian Lines
.268 Cyclist Crossing Markings
.27 Horizontal Markings: Multi-directional, Graphic, Alphanumeric Forms
.270 Arrows
.271 Oblique Parallel Lines
.272 Word Markings
.273 Obstruction Markings
.28 Vertical Markings
.280 Objects-Within Roadway
.281 Objects-Adjacent to Roadway
.282 Objects-end of Roadway
.283 Delineators-Curb
.284 Delineators-Upright
.285 Channelizing Devices--Traffic Cones
.286 Channelizing Devices--Tubular Markers
.287 Barricades--Portable
.288 Barricades--Permanent

"Then, if you're a writer, like me, you try less
to impose a shapeon the holdge podge than
to see what shape emerges it."
Buechner, Faith and Fiction in
Spiritual Quests, 1988, 114.

51 All-lighted Signals
511 Trackside Signals (Signals Governing Train Movements on One Track [SGTMOOT])
.1 Basic Shapes
.10 Rectangle/Rectangular Backplate: Vertical
.11 Rectangle/Rectangular Backplate: Horizontal
.12 Rectangular Backplate: Slanted [Lamp Configurations: Single Row (SR), Double Row (DR), Irregular (IR), Random (RN)]
.13 Circles [Lamp Configurations: Triangular Arrangement (3) Lamps, Single Lamp (Multiple Lenses), Circular Arrangement (8, 9 Lamps), Cluster Arrangement (4) Lamps)]
.14 Triangles [Lamp Configurations: Triangular Arrangement (3) Lamps)]
.15 Octagons [Lamp Configurations: Multi-Row Arrangement]
.16 Square Backplate [Lamp Configurations: SR, DR, IR]
.17 Diamond Backplate [Lamp Configuration: Single Lamp [Multiple Lenses]

.2 Special Shapes: France & Algeria
.20 Inverted "L" (two rectangles fused together; one one on a horizontal plane, one on a vertical plane). [Lamp Configurations: "L"-shaped 3, 4, 5, 6 Lamps)].

.21 Rectangles (Vertical dimension more prominent; joined together in a non-synchronic manner. [Lamp Configuration: Assymetrical (3 Lamps)]

.22 Rectangle/Circle Fused Together [Lamp Configuration: Assymeterical (3 Lamps)]

.2 Special Shapes: Other Nations

.23 Rectangular Backplates [Lamp Configurations: Double Row (2, 4 Lamps)]

.231 Rectangles Fused Together (Off-centered "V" Pattern, rounded ends), DSB [Lamp Configuration: "V"-shaped Pattern (5 Lamps)]

.232 Rectangle with Rightward Triangular Extension, Rounded Ends, SNCB [Lamp Configuration: SR/DR (5 Lamps)]

.233 Rectangle with Rightward Rectangular Extension, Cropped Corners, PKP, [Lamp Configuration: IR (6 Lamps)]

.24 Truncated Parallelograms

.240 Single Basic Form, DR, PKP [Lamp Configurations: Assymetrical DR (2, 4 Lamps)

512 Dwarf Signals (Signals Governing Train Movements From One Track to Another Track, SGTMFOTTAT)

.3 Basic and Special Shapes [Lamp Configuration: Generally SR; Some Irregular; also Graphic, Alphanumeric, Composite (1-3

Lamps and/or 1 or more other symbols)]

.31 Square-Shaped Signals [Lamp Configurations: Double Row, Assymetrical, Circular, Graphic, Alphnumeric Symbols (3-7 Lamps, and/or 1 or more other symbols)]

.32 Triangle/Triangular Shaped Signals [Lamp Configuration: Triangular-Shape Frequently; some arrangements are assymetrical (1-3 Lamps)]

.33 Other Shapes

.330 Circles

.331 Octagons

.332 Arms

.333 Obrounds [Lamp Configurations: Diverse (1 to nearly 20)]

52 Partially-Lighted Signals

521 Semaphore and 522 Signal Boards

.4 Basic and Special Shapes

.40 Blade-Spectacle Fully Integrated (BSFI): Rectangles

.41 Blade-Spectacle Fully Integrated (BSFI): Rectangular I (A)

.42 Blade-Spectacle Fully Integrated (BSFI):

.43 Blade-Spectacle Fully Integrated (BSFI):

.44 Blade-Spectacle Integrated Through Linkage (BSFI)

.45 Blade-Lamp Partially Integrated (BLP)

.46 Blade-Lamp Separate (BLS)

.47 Special Shapes

.470 Propeller Arm
.471 Double Arm
.472 Lattice-Work with Opening in Blade (Circular)
.48 Signal Boards: Rotary Form
.49 Signal Boards: Hinged & Stationary

523 Partially-Lighted Signals: Dwarf Semaphore, Rotating Discs & Composite Discs

.5 Dwarf Semaphores, Rotating Discs & Composite Discs
.50 Semaphore, Dwarf
.51 Rotating Discs
.52 Composite Discs

524 Partially-Lighted Signals: Revolving Signals

.6 Revolving Disc & Enclosed Graphic Signals
.64 Revolving Discs
.65 Enclosed Graphic Signals
.7 Open Graphic Symbols (Targets)
.70 Mask-Shaped Vanes
.71 Arrow-Shaped Vanes
.72 Oval-Shaped Vanes
.73 Rectangle-Shaped Vanes
.74 Obround Vanes
.75 Miscellaneous Shapes of Vanes
.750 Circle & Square
.751 Circle & Chevron

.752 Diamond/Single Vane
.753 Triangle (Truncated) & Oval
.754 Octagon/Single Vane
.755 Square & Square
.756 Square & Square (with graphics)

53 Unlighted Signs, Markings, Signals

533 Signs

.1 Speed Signs
.10 Announcing of Restrictions
.11 Ending of Restrictions
.12 Within Categories of Restrictions: Nuanced
Nuanced Variant Forms
.120 Temporary/Permanent Differentiations
.121 Special Designation of Trackage:
Branch Line
.122 Special Designation of Trackage: Maine Line
.123 Designation of Train Speed Categories:
Express
.124 Designation of Train Speed Categories
.125 Designation of Train Speed Categories:
Freight
.126 Lighted Dimension to Signs
.127 Distance Dimension to Restriction Signs
.2 Other Signs

534 Markings
.3 Pillars, Petites, Board & Sign-like Objects
.30 Pillars

.300 Straight-Line/Flat-top Forms
.301 Pointed-Top Forms
.302 Tapered Forms
.303 Forms with Visible Undergirding
.304 Lighted Forms
.31 Petites
.310 Cylinders
.311 Square Post -- Flat-Top
.312 Square Post -- Pointed-Top
.313 Rectangular Post
.314 Horizontal Slab
.32 Boards
.320 Tall With Visible Undergirding
.321 Tall Without Visible Undergirding
.322 Intermediate With Visible Undergirding
.323 Symbols for Board (Stripes [Two Forms], Zig-zags, Chevron, Checks)
.33 Sign-Like Objects
.330 Forms With Primary Horizontal Dimension
.331 Forms With Primary Vertical Dimension
.332 Square Forms With Single Support
.333 Special Forms With Single Support

535 Movable Signals

.4 Movable Signals
.40 Staff, Ticket, Tablet & Token Forms
.400 Manual Staffs
.401 Staff & Tickets
.402 Electric Staff
.403 Electric Token

.404 Key Token
.405 Electric Tablet
.406 Tokenless System (Paper Ticket)
.41 Train Order & Time Interval
.410 Telegraph Train Order System
.411 Train Order System
.412 Time-Interval System
.413 Telegraph Block System

56 Multi-message Railway Aids
562 Lighted/Unlighted Devices [Sound may be present]
5621 Barriers & Gates
.1 Lighted Forms
.10 Lighted LC/GC Signals
.100 Free-Standing
.101 Attached to Other Devices
.11 Barriers & Gates
.110 Full Barriers & Gates
.111 Manually Operated Barriers
.112 Half-Barriers & Gates

"For many writers, writing begins with conversations,
ones you have with others,
ones aloud with yourself,
ones you overhear
and ones with documents and ancient texts."
Matt Love
The Sunday Oregonian
1-31-10, page 08

Chapter 3B3 Variant Classification Notes

i Marine Aids to Navigation

The previous edition included extensive general notes under this heading. Limited specific notes were also included. However, most of that material is omitted here. The information for this edition will be specific statements about changes since the previous edition. The older edition, of course, can be consulted.

The heading for Floating Aids begins with the basic categories. One additional category has been added: 15 Radio Buoys. One new entry is also added: .42 Ground - & - Spaced-Based Systems. It includes .424 Transit and .435 Omega. The entries were moved from the main classification.

The third and second editions are very consistent otherwise.

ii Aeronautical Navigation Aids

Heliport Approach Light Systems are added to the variant classification: .126 under a heading of .12 Approach Lighting Systems: ICAO & NATO.

Final Approach Equipment has been overhauled for this edition: .20 Color Coding is split into .20 Color Coding: 2-Color and .21 Color Coding: Tri-Color. .22 Final Approach Equipment: Pattern, Pulse and Alignment

Coding is divided into Pattern & Pulse Coding, and .23 Final Approach Equipment: Alignment Coding.

.42 Signs Under Heading of Marker has been augmented by several markers that were listed in the main classification. The terms in question appeared to be very specialized and more appropriate to this classification. They include .421 Aircraft Arresting Marker, .423 Distance-to-go Marker, and .428 VOR Check-Point Marker.

.64 Markings Under Name of Marker-Single Forms is a section transferred from main classification because of the restricted nature of the devices. There are four entries.

Several marginal, if not obsolete, aids have been moved from the main classification. They are headed by .70 Hyperbolic Aids: .700 Loran-C, .701 Decca, .702 Consol.

iii Traffic Control Devices

The TCD monograph (Part E, 2004) has a classification newer than that of Part H. As a result there are several changes made in the 2nd ed classification in Part H.

Flashing signals display a variety of changes. .10 Traffic Beacons has been replaced by Flashing Beacon. However, the older term is retained but Flashing is added as a qualifier. The Database includes information on the use of various terms. .100 Hazard Identification Beacons are replaced by Warning Beacon. Again, the older term is

retained but qualified by Warning.

Three categories of lighted aids are added in Part E. These are lacking in Part H (2nd ed). They include .11 Lighting Devices which is occupied by three forms. .12 In-Roadway Lights and .13 Miscellaneous Signals are two other categories to be found in Part E.

.209 Other Dangers in Warning Signs is moved to the main classification. That designation is now assigned to Carriageway Narrows sign which is found in Part E but not Part H. .24 Prohibitive Signs are renamed Prohibitory and Restrictive. Standing and Parking signs are also in Part E.

Markings have been substantially overhauled. The core category, .28 is now Vertical Markings and contains all of the former entries save two possibly questionable entries, Pavement Markings and Curb Markings. They are both basic terms and not of a variant character. Two new categories are for Longitudinal and Transverse Forms (.26), and Horizontal Markings: Multi-directional, Graphic, Alphanumeric forms (.27).

iv Railway Signals

All-lighted and Partially-lighted are very similar in construction both for Part H. Some forms of aids have undergone change.

Signs in the lst and 2nd editions were divided into Other Signs and Speed Signs. Many European systems had

extensive speed signs but only limited signs of other functions. As a result the classifications reflected that situation. However, that distinction is reduced for the 3rd ed. Signs in variant classification (and main) are under a single heading (533) with a subdivision into general signs (.2) and speed signs (.1). Most variant signs refer to speed regulations. But a segment is set aside for other variant forms.

A partial assemblage of Movable Signals were attached to .6 Revolving Discs & Enclosed Graphic Signals. That has been deleted. Full-coverage was also included under 533. That coverage is continued in this edition with a division into .70 Staff, Ticket, Tablet & Token forms, and .71 Train Order & Time Interval.

The final material focusses on 56 Multi-message Railway Aids. A partial coverage was available in the 2nd edition only in the main classification. A full assemblage is now in use. It consists of .1 Lighted Forms and subdivided into .10 Lighted Signals, and .11 Barriers & Gates.

"For Art and Science cannot exist but in minutely organized Particulars."
William Blake in Ginsberg, Meditation & Poetics in *Spiritual Quests*, 1988, 157.

3C Variant Classification in a Different Key:
T-M in One Nation: The United States

1 Floating Aids to Navigation: Marine Use
12 Lighted & Lighted Sound Buoys
121 Most Exposed
1210 Lighted Buoys
1211 Lighted Whistle Buoys
1212 Lighted Horn Buoys
1213 Lighted Bell Buoys
1214 Lighted Gong Buoys
122 Exposed
1220 Lighted Buoys
1221 Lighted Whistle Buoys
1222 Lighted Horn Buoys
1223 Lighted Bell Buoys
1224 Lighted Gong Buoys
123 Semi-Exposed
1230 Lighted Buoys
1231 Lighted Horn Buoys
1232 Lighted Bell Buoys
124 Protected
1240 Lighted Buoys
125 Most Protected
1250 Lighted Buoys
126 Discrepancy Buoys
1260 Lighted Buoys
127 Major Aids
1270 Large Navigational Buoy (LNB)
128 All-Lighted Forms
13 Unlighted Buoys

131 Most Exposed
1310 Can Buoys
1311 Nun Buoys
132 Exposed
1320 Can Buoys
1321 Nun Buoys
133 Semi-Exposed
1330 Can Buoys
1331 Nun Buoys
134 Ice
1340 Can Buoys
1341 Nun Buoys
135 Western Rivers
1350 Can Buoys
1351 Nun Buoys
136 Swiftest Western Rivers
1360 Can Buoys
1361 Nun Buoys
137 Foam-Filled Buoys
1370 Can Buoys, Protected
1371 Nun Buoys, Protected
1372 Can Buoys, Most Protected
1373 Nun Buoys, Most Protected
138 Plastic Buoys
1380 Can Buoys, Protected-Temporary
1381 Nun Buoys, Protected-Temporary
1382 Can Buoys, Most Protected-Temporary
1383 Nun Buoys, Most Protected-Temporary
139 Discrepancy Buoys, Most Protected-Temporary
(Foam-filled Plastic)
1390 Unlighted Buoys, Can Daymark

1391 Unlighted Buoys, Nun Daymark
130 Other Unlighted Buoys, Single Forms
1300 Spar Buoys
1301 Sphere Buoys
1302 Drum Buoys
1303 Barrel Buoys

15 Sound Buoys
150 Single Types
1500 Bell Buoys
1501 Gong Buoys
1502 Whistle Buoys

2 Fixed Aids to Navigation: Marine Use
22 Lighted Aids
221 Major Light Structures
2210 Enclosed Towers
2211 Skeleton Towers
2212 Houses/Towers on Special Foundations
222 Minor Light Structures: Marine Sites
2220 Single Pile
2221 Multiple Pile
2222 Standard Structures on Special Foundations
223 Minor Light Structures: Land Sites
2230 Post
2231 Spindle
2232 Skeleton Tower
2233 Cylindrical
2234 Small House
2235 Pyramidal
224 All-lighted Forms

2240 Major Lights
2241 Minor Lights

23 Unlighted Aids
231 Marine Sites
2310 Single Pile
2311 Multiple Pile
232 Land Sites
2320 Post
2321 Spindle
2322 Stake
2323 Tripod

24 Electronic Aids to Navigation
241 Short Range Aids
2410 Radiobeacons
2411 Racon
2412 Radar Reflector
242 Long Range Aids
2420 Loran-C
2421 GPS
2422 DGPS

25 Fixed Sound Signals
250 Single Types
2500 Diaphragm Oscillator [Pure tone, Bell tone, Gong tone]
2501 Air Horn
2502 Bell
2503 Diaphone
2504 Siren

3 Aeronautical Navigation Aids
31 All-lighted Aids
321 Approach Lighting
3210 Lampholder Unit
3211 Sequence Flashing Light
3212 Generic Visual Glideslope Indicator
3213 Precision Approach Path Indicator
3214 Medium Intensity Approach Lighting Systems
3215 High Intensity Approach Lighting Systems
32 Partially-Lighted Aids
322 Beacons
3220 Rotating
3221 Flashing
323 Runway & Taxiway Inpavement Lighting
3230 Runway Centerline Lights
3231 Runway Touchdown Zone Lights
3232 Runway Edge Lights
3233 Runway Threshold/End Lights
3234 Land & Hold Short Lights
3235 Taxiway Centerline Lights
3236 Taxiway Intersection Lights
3237 Runway Guard Lights
3238 Stop Bar Lights
3239 Taxiway Edge Lights

324 Runway & Taxiway Elevated Lighting
3240 Intensity Runway Edge Lights
3241 Threshold/End Lights

3242 Taxiway Edge Lights
3243 Stop Bar Lights
3244 Holding Position Edge Lights
325 Obstruction Lighting
3250 Steady-Burning Red Light
3251 Flashing Beacon
3252 High Intensity Flashing White Light
3253 Medium Intensity Flashing White Light
326 Partially-Lighted Signs:
Taxiway Guidance and Runway
3260 Mandatory Instruction
3261 Location
3262 Direction
3263 Taxiway Ending Marker
3264 Destination
3265 Roadway
3266 Information
3267 Runway Distance Remaining
327 Wind Indicators
3270 Wind Cone
3271 Wind Tee
3272 Wine Tetrahedron

33 Unlighted Aero Navigation Aids
330 Runway Markings
3310 Centerline Markings
3311 Designation Markings
3312 Threshold Markings
3313 Holding Position Markings
3314 Touchdown Zone Markings
3315 Side Stripes Markings

3316 Aiming Point Markings
3317 Arrows & Arrowheads
3318 Chevrons
332 Taxiway Markings
3320 Centerline Markings
3321 Edge Markings
3322 Holding Position Markings
3323 Horizontal Signs
3324 Shoulder Markings
3325 Geographic Distance Markings
333 Other Markings
3330 Vehicle Roadway Markings
3331 VOR Receiver Checkpoint Markings
3332 Non-Movement Area Boundary Markings
3333 Relocated Threshold Markings
3334 Closed Runway & Taxiway Markings
334 Runway & Taxiway Retroflective Markers
3340 Inpavement-Centerline
3341 Elevated-Edge
335 Obstruction Markings
3350 Patterns
3341 Markers
330 Single Types
3300 Segmented Circle Airport Marker System
3301 Compass Calibration Pad
34 Electronic Aids
341 Course and Distance Signals
3410 Glide Slope
3411 Localizer
3412 VOR
3413 VORTAC

3414 TACAN
3415 DME
3416 GPS
342 Location Identification Signals
3420 Non-Direction Beacon
3421 Marker Beacon
3422 Compass Locator (COMLO)

4 Traffic Control Devices
41 Traffic Signals
410 Single Forms
4100 Traffic Control Signals
411 Specialized Uses
4110 Flashing Beacons
4111 Lane-Use Control Signals
4112 Movable Bridge Signals
4113 Railroad Crossing Signals
4114 Ramp Control Signals
4115 Pedestrian Signals
4116 Emergency Vehicles Traffic Signals
4117 One-Lane/Two-Way Signals
4118 Lighting Devices

43 Signs and Markings
431 Regulatory Signs
4310 Dominant Model, Rectangles (vertical emphasis)
4311 Secondary Model, Squares
432 Warning Signs
4320 Dominant Model, Diamonds

4321 Supplemental Model, Rectangles (vertical emphasis)
4322 Supplemental Model, Squares
4323 Supplemental Model, Triangles (isosceles)

433 Guide Signs
4330 Dominant Model, Rectangles (horizontal emphasis)
4331 Special Shape, Shields
4332 Special Shape, Rectangles (elongated-vertical emphasis)
4333 Supplemental Model, Rectangle (vertical emphasis)

434 Markings
4340 Pavement Markings
4341 Curb Markings
4342 Object Markers -- Within Roadway
4343 Object Markers -- Adjacent to Roadway
4344 Object Markers -- End-of-Roadway
4345 Delineators-Curb
4346 Delineators-Upright
4347 Barricades
4348 Channelizing Devices

45 Sound
450 Railway Crossing Signal Bells
451 Audible Pedestrian Signals

5 Railroad Signals, Signs and Markers

51 Lighted Signals
- 511 Trackside Signals
  - 5110 Searchlight-Color Light Signal
  - 5111 Color-Light Signal
  - 5112 Position-Light Signal
  - 5113 Color-Position Light Signal

52 Partially-Lighted Signals
- 521 Semaphore Signals
  - 5210 Trackside Signals
  - 5211 Dwarf Signals
- 522 Switch Signals

53 Unlighted Signals, Signs, Indicators, Markers
- 531 Targets
  - 5310 Color
  - 5311 Shape
  - 5312 Position
  - 5313 Color-Shape
- 532 Miniature Graphic Symbols
- 533 Signs
  - 5330 Location Signs
  - 5331 Advanced Location Signs
  - 5332 Speed Control Signs
  - 5333 Safety Signs
  - 5334 Maintenance of Way Signs
- 534 Markers
  - 5340 Monument Markers
  - 5341 Alignment Markers
  - 5342 Elevation Markers

55 Sound Signals
550 Cab Signal Bells

Note

The US classification exists in both main and variant forms. However, only the main classification is included. The US main classification can be regarded as a variant form in its relationship to the principal international classification. The US variant version can be seen as a subset of the international form.

The 2nd edition of Part B offered many classification. The diversity of classifications was made possible in part because of the restricted nature of the study: T-M in one nation. The restricted nature of the study: T-M in one nation. The restricted nature of the study also permitted an integrated, horizontal approach that could encompass all forms of T-M. The range of classifications in Part B follows this outline:

I. Quadripartite Main Classification
   A. Main form (Included in Part H)

   B. Schematic Classification (Grid pattern with numerical format)
   C. Pictorial Classification (Schematic form with grid and numerical format)
   D. Multiple and Variant Classification (An extrapolation and expansion of the main classification with an alternate

numbering system)

II. Double Transition Classification
    A. Markings Within Forms of Energy
    B. Markings Within Forms of Messages
III. Tripartite Message Classification
    A. Nature of Message Classification
    B. Macro-Messages Classification
    C. Selective Message Classification of Signs and Markings
        1. Traffic Control Devices
        2. Aero, Rail, Marine Aids
IV. Marking Phenomena in Themselves (Index)

"Since early antiquity people have oriented themselves by natural signs: sailors navigated by constellations, the Magi followed a star. When these proved insufficient, we invented others, some of which are culturally specific. Invented signs were added to the natural ones."

Georges Jean, *Signs, Symbols and Ciphers* 1998, 85

CHAPTER FOUR

NOMENCLATURE

WITH INDEX OF CLASSIFICATION &

NOMENCLATURE MATERIALS

" Whereas for Augustine, all things, even in their material nature were to be referred for their truth to God who was their beginning and also their final goal, St Thomas Aquinas, partly as a result of his assimilation of Aristoleian philosophy, was concerned with things as they were in themselves, without simply referring them to God. So it was important to acquire knowledge of things for themselves, beginning from sensory knowledge, and proceeding to define and understand for their own intelligibility, and only then finding their order in relation to God. Thus they retained their nature even while it was perfected when brought into relation with God, les his work in grace conflict with his work in creation."

Hardy and Ford,

Praising & Knowing God, 1985, 184.

"... and because His goodness could not be adequately represented by one creature alone, He produced many and diverse creatures, that what was wanting to one in the representation of the Divine goodness might be supplied by another. For goodness, which in God is simple and uniform, in creatures is manifold and divided; and hence the whole universe together participates in the Divine goodness more perfectly, and represents it better than other single creatures whatever."

Thomas Aquinas, *Summa Theologica,* 1, Q-27-94, 255.

"Mircea Eliade once made the point that many new intellectual breakthroughs in the modern world occur not in universities but outside them, through the cross-fertilization of minds and ideas drawn from different disciplines and backgrounds. New discoveries and syntheses are often born out of transdisciplinary encounters the bold embrace of diverse elements hitherto kept apart."

Ursula King, *Christ in all Things: Exploring Spirituality with Teilhard Chardin,* 1997, 39.

4A Nomenclatures for Main, Variant & Adjunct Classification

1 Main Classification

a) Background

A study of Transportation-Markings requires a bringing together -- in a manner both compact and comprehensive -- the varied and diverse elements that make up the field of T-M. The lack of any existing integrative approach makes that 'bringing together' yet more imperative. The approach for providing that linkage for this study is that of classification. Classification can not only provide points of connection but it can also uncover pre-existing connections, and areas of commonality between and among markings. This segment of the monograph focusses on nomenclature which includes the threefold classification of main, variant, and adjunct forms.

T-M nomenclature and classifications are confronted with a problem: the surface appearance of a single T-M system displaying a strongly unified pattern may not be entirely the case since the four modes of transportation and their markings have developed differently, and the classification requirements of different forms of markings do not have an identical content and form. There has been movement toward an integral system but it is far from complete.

The classification of marine markings is twofold:

buoys follow the IALA pattern in main classification with national and regional patterns in the variant classification. However, other forms of marine aids to navigation lack IALA standards, or at least fully worked out guidelines. This has meant construction of a classification from available IALA information augmented by IHB source materials. USCG and USNOO (a US agency of many names) are also major sources of marines aids information. The marine practices of nations heavily involved in a given form of marking are also significant sources. Norway, for example, has the largest system of unlighted beacons and thereby influences the classification of daybeacons. The classification partly mirrors international standards but also includeds less official though accepted practices. The result is a construction that displays coherence though, admittedly, it can also include flaws.

The aero aids classification has the backing of ICAO standards and practices and reflects an agreed upon international system. US FAA is also a significant factor in the system. The variant classification incorporates variant and additional forms from FAA, NATO, manufacturers and major national systems. The aero classification reflects international practice though it remains not entirely precise.

The railway signal classification can be said to be an antithesis of the aero model: only limited sources go beyond national boundaries. Much of this classification draws on many different sources. It incorporates materials from many major railway systems and augmented by manufacturing and regional association data. It exhibits a

provisional character though it does approximate the actual character of railway signals.

The traffic control devices classification employs UN documents for its foundations along with other sources including that of the US and other national and regional source materials. The classification reflects the international TCD situation though the level of precision is somewhat reduced because of diverse sources have been incorporated.

The end result of the T-M classification is a set of four different classification "families" within a single matrix. In some sense the classification "creaks and groans." But considering the difficulties of creating a discipline of T-M the end result is more than merely an embryonic stage. The internal stresses and strains do not doom the classification though they require alertness on the part of the user.

b) Nomenclature

The nomenclature, or rules, for naming and classifying T-M were established in 1969-1970 with an alteration to the rules in 1984. The classification system has been greatly influenced by the Dana System of Mineralogy (1944 edition edited by Charles Palache). The Dana system uses numbers (The 1997 edition adds decimals to the numbers) as well as names for mineral specimens. In a sense the schema adopted is not a "natural" pattern though neither is it an artificial pattern imposed on T-M forms.

The system has four levels (each represented by a single digit): the mode of transportation; the nature of the marking; the classes of markings (when applicable); and the individual markings. Marine aids to navigation has been divided into floating and fixed submodes. A possible third submode for spaced-based aids has so far not been added.

The buoy submode is represented by the number "1" and the fixed aids submode by "2." Aeronautical navigation aids adjoin marine and are alloted "3." Traffic control devices mode is represented by "4" and railway signals, signs, and markings mode by "5."

Other arrangements by mode of transportation would be possible. Historically, road markings are probably the oldest, followed chronologically by marine, rail and aero. There are reasons for the current arrangement. Marine can justify its central position by the complexity and diversity of those aids. Many aero aids are unlighted or partially-lighted. Many aids are of an electronic nature for both modes. Many aero aids are less in a traffic control mode than road or rail; this is also true of marine aids. Historically key marine and aero aids shared a common name. In addition, the "beacon" form is a commonplace of marine and aero aids while the "signal" form is a major form for many rail and road safety aids. Road and rail have more defined routeways (or travelways) than aero and marine. The term traffic control has more of a meaning for those modes as a result. The taxonomic order of marine, aero, road, rail is therefore a plausible arrangement for the

primary classification.

The number "3" denotes unlighted markings (signs, pavement markings, buoys without sound or lighted mechanisms). Acoustical signals are "4" in the classification and electronic devices are "5." Markings with messages from two different categories are listed under "6" (e.g., a lighted sound buoy). Because of changes in the system, and in different monographs, it is necessary to examine and alter the numbers of some T-M forms in older classifications as they appear in Part H.

The third digit number is not required for all markings. It is needed where two or more groups of markings are found within a message type. For example, there are several forms, or classes, of unlighted buoys: nuns, cans, spars, etc. There the third digit or class designates the various groups. A "0" will occupy the third digit position when classes do not exist.

The last digit denotes the specific marking number which allows for up to ten members for a specific classification sequence.

A classification problem developed with traffic control devices. Traffic signs merge the type of sign (in a physical other-than-semiotic sense) with the message so that instead of a single marking which can be programmed for many different specific message characteristics (such as a marine light), the traffic sign has a fixed and very narrow message. As a result there are many types of signs each with one

message. This classification is of types rather than messages but since traffic signs closely unite type and message they cannot be "broken" apart readily. This has meant that the last digit does not represent individual signs since they are more in the form of semiotic signs -- in some sense and to some degree -- than to physical signs. For example, under 432, regulatory signs, there are several categories of signs and these in turn are divided into sub-categories (listed in the variant classification). A message for a sign affects the physical appearance of the sign as a physical unit and is therefore within the nomenclature of the classification. See also Part A for further information.

A review of the system shows several changes. "0" represented fully-lighted markings in the earliest versions, while "1" so designated those markings from about 1981 on. An attempt to distinguish between gradations of less than fully-lighted markings create subsystems: "1" for more-than-half-lighted, "2" for half-lighted and "3" for less-than-half lighted in early versions (but possibly it was not present in very early versions). By 1981 the less-than-half-lighted segment was dropped but the more-than-half-lighted was retained until the second edition of Part A, in 1991. All less than fully lighted markings termed partially-lighted are designated by "2." Unlighted markings were formerly classified as "4" but are now "3."

In older versions "5" designated acoustic aids and "6" denoted electronic aids but the reduction in less than fully lighted segments caused acoustic to become "4;' electronic became "6." Combination forms are frequently employed

and designates markings incorporating two different basic forms of messages (visual and acoustic, etc. rather than different levels of visual). The 1981 edition included an "0" indicating a "dual message options" rather than a fully-lighted marking. That segment was added to cover similar shaped buoys emitting quite different forms of messages (for example, an unlighted conical buoys versus a lighted conical buoy). But that segment was latter dropped and similar shaped buoys were numbered according to their basic range without regard to a shared shape.

There are four modes of transportation (though the classification has created sub-modes for marine due to the special nature and abundance of floating aids). The early forms of the principal classification added an additional sub-mode for marine: fixed marine aids located in water; a pedestrian mode separate from traffic control devices for vehicles.was also added. The marine sub-mode was merged with other fixed marine aids, and the pedestrian mode, a very small segment, was merged with other traffic control devices.

In summary, the transportation-markings classification follows this pattern:

First Digit: mode of transportation: marine (in two parts), aeronautical, road and rail.

Second Digit: nature of the message (visual divided into all-lighted, partially, and unlighted; acoustical, electronic, combination).

Third Digit: classes of a given form of marking when applicable.

Fourth Digit: individual markings number (altered to group of closely united markings when numerous).

4A2 Variant Classification

The original classification did not include a variant classification. However, the decentralized nature of railway signal materials required the addition of such a classification. Such a classification was needed since the lack of a central source of organized information required including diverse terms from many sources. The many forms and subforms would have overwhelmed the main classification. It became apparent that all modes of transportation would require such a classification even with less diverse sources of information.

The aeronautical classification also contained a variant classification though it did not contain a nomenclature to accompany it in contrast with the railway signal classification. Eventually all other modes would have a variant classification and a nomenclature. This additional work cannot be done with a high level of precision since the needs of the modes are notably different. Nonetheless, the nomenclatures from railway -- and eventually from marine and road variant classification -- lead to more general guidelines.

The variant classification has three levels marked off by one, two, or three digits. Each category is preceded by a decimal point. .1 (and succeeding numbers) refers to a basic subdivision which can be: a) coterminous with a

three-digit of the main classification (e.g. 510, Signals Governing Train Movements on One Track); b) or a special subdivision within a three-digit group (e.g., the shape of signals require a bifurcation into basic shapes and special shapes but within a three-digit category); c) or coterminous with two or more three-digit categories (e.g. five categories of aero partially lighted aids are within one variant category, .2).

Two-digit designations (.10 and above) refer to primary segments within the basic subdivisions. These segments may consist of shape configurations, equipment types, functions of aids or systems that aids are part of.

Three-digit designations (.100 and above) refer to secondary shape configurations, and other features that define an actual marking.

The use of .1, .10 and .100 and beyond are found with each transport mode classification. This reuse of number is possible since the variant classification numbers are attached to the main classification designations. An analogy to this practice is found with telephone numbers in which the final four digits can be used repeatedly since the first digits are not replicated in a given area and area code designations are not reused at all.

Because of extensive international efforts for marine, aero and road safety there are fewer variants in those modes. Since railway transportation is more decentralized there are more variant forms. In fact, railway signals have

more single, double and triple digit entries than the other three combined. Therefore, beyond the general description of the tripartite variant classification nomenclature, the focus of attention is on railway signals and rules. A second descriptive treatment will consider the more limited variant needs of the other three.

The marine variant classification centers on non-standard forms. Buoys that are notably different in shape from IALA forms (as well as fixed visual aids outside of IALA) make up the bulk of the entries. There are four one-digit entries: floating, fixed visual, acoustic and electronic aids. Three-digit categories replicate those of the main classification though not with the same entries. IHB, IALA surveys, and national exhibits are the source of the entries.

Traffic control devices has only two two-digit categories: signals, and signs and markings. Sign entries are primarily UN in origin. Their abundance prevented inclusion in the main classification. Therefore, sub-forms rather than variant forms highlight the category. European and Western Hemisphere sources have influenced the signal category which includes additional and variant forms; some signs have also been added from those sources. Markings have a more unitary and limited configuration. As a result there is less need to provide a variant form for markings.

Only three one-digit categories are needed for aero aids. Nonetheless, a great measure of complexity is present. The multiple use of similar fixtures for manifold functions, the overlap in terminology for flashing lights, the close

affiliation of lights with systems, and the abundance of obsolete and obsolescent final approach indicators require an extensive classifitory schema. The main classification would become less operational with that many aids added to it. The contents of the aero variant classification is therefore at variance with many of the entries of allied classifications since some entries could have been placed in the main classification if volume and diverse of phenomena had been less. Nonetheless, the variant classification framework of three levels (one to three digits) is present.

4A3 Adjunct Classification

In the beginning T-M consisted of one classification system though it grew into a multifaceted phenomenon. In 1991 it was joined by a varient classification created to meet the diverse needs of the railway signal classification. During the years 1997-2001 a four-part database was added to the Monograph Series (lst ed). It was to be influenced by -- and to influence -- the classifications. However, the range and chronology of the database precluded a close inter-relationship of classification and database. It became apparent that further work on the classification was required to more adequately work with the database and that continued to be the case. However, it now appears that the database and its indexes (especially that of the category index) is also a classification. That adjunct classification remains in the database because of its size. An introduction with some basic rules have been added to this study.

It can be noted that classifications and databases are

two different kinds of entities. A classification defines objects with some degree of precision. It organizes them according to some principle. It has a tendency to draw concepts together. A database may have an organizing principle but it defines less, and gathers up diverse data in a manner that can be expansive and even sprawling. It is not tightly organized or arranged. It can become almost an explosion of terms. Nonetheless, there needs be connections between classification and database. A primary connection can be the categories index of the database which functions as a classification.

The category index of the database includes current and official. That is also the focus of the main classification as well as the variant classification. That index also includes other forms of materials:

1) Historic terms. This refers to terms in use in use before 1950; those terms refer to aids not employed after that date.

2) Obsolete/Obsolescent terms. These terms while no longer current appear in the literature after 1950 and presumably have found some use since that date. Some or many of these entities are in the main classification since a line between official and current, and marginal and older T-M forms is often uncertain. Admittedly, there are many terms that cannot be dated with precision.

3) Rare terms. Terms used by one author or appearing in one or two sources may have validity yet cannot be regarded as official or what may be mainstream enties.

4) Quasi-terms. There are uncertain terms that may be descriptions of a safety aid yet may appear to be a term or

approximating a term. These entries frequently appear in the database despite uncertainty about their status.

Classification can take many forms. Even an alphabetical index can be a classification since it reflects some principle of arrangement (e.g. the nationality of names, major topics, chronology of events; see S. Jevons, *The Principles of Science: A Treatise on Logic and Scientific Method*, Dover 1958, 680-681). The categories index can be seen as a classification for the same reason. The principle at work is that of categories of T-M forms. The database also includes an alphabetical index which also qualifies as a classification.

The categories in both detailed and summary forms are found with the database monographs (Ii-Iv). A summary form is listed in the *General Table of Contents.* Categories include indexes, overarching terms, major T-M forms, morphological, message, physical and historical terms. The categories vary with the type of safety aid and, in some instances, may be embedded into the name of the aid.

"Art and technology can give cosmic realties a higher kind of sacramentality by imparting to them something of the luminous intelligibility of the human mind.

Mullahy, *The Splendid Risk: An Existential Approach to Christian Fullfillment,* 1982, 147.

4B Index of Classification & Nomenclature

Materials in the Monograph

4B1 Main Classification

Foundations, Part A, Volume I, 5th edition, 2008

Chapter 1A
Classification of message with related data, pgs 43-46

A First Study in Transportation-Markings: The US, Part B,
Volume I, 2nd edition, 1992

Chapter 7B [1B]
Forms of Classification, pgs 7-11
Classification of Messages, pgs 11-17
Chapter 8A [2A], Main Classification,
Outline Form Within Transportation Modes, pgs 23-32
Explanatory Notes, pgs 32-38
Chapter 8B [2B], Variant Classification
Schematic Classification, pgs 39-43
Pictorial Classification, pgs 44-50
Explanatory Notes, pgs 51-54
Appendix: Classification Expansion & Explications
i a) Multiple & Variant Classification, pgs 107-119
b) Explanatory Notes, pgs 119-125
ii Double Transition Classification
a) Markings within Forms of Energy, pgs 127-134
b) Markings within Marking Forms, pgs 134-140
c) Explanatory Notes, pgs 140-146
iii Classification of Messages: Signs & Markings

a) Traffic Control Devices, pgs 149-165
b) Aero, Railway & Marine, pgs 165-172
c) Explanatory Notes, pgs 173-176

International Marine Aids to Navigation, Parts C & D
Volume I, 3rd ed. 2010

Chapter 3, Classification & Description of Buoys in International Usage
Ch 3A2, Classification, pgs 47-50
Ch 3A3, Explanatory Notes, pgs 50-55
Ch 3C, Illustrated Classification with Notes, pgs 70-77
Chapter 5B1-2, Fixed Light Markings
Classification, pgs 121-123
Explanatory Notes, pgs 123-129
Chapter 6B1, Daybeacons
Classification, pgs 156-157
Explanatory Notes, pgs 157-158
Chapter 7A3, Radio Aids
Classification, pgs 181-183
Explanatory Notes, pgs 183-184
Chapter 8A2, Fog Signals
Classification, pgs 202-204
Explanatory Notes, 204-205
Appendix II, Unified Classification of Marine Aids to Navigation, pgs 215-225

International Traffic Control Devices, Part E, Volume II,
2nd ed. 2004

Chapter 2A1-3, B1, B3
  Classification, pgs 59-68, 75-79
  Explanatory Notes, pgs 68-75
Appendix II, Comparative Review of Road Signs
  [Quasi-Classification in Chart Form], pgs 177-194
  Explanatory Notes, pgs 195-199

International Railway Signals, Part F, Volume II, 1991

Chapter 29A [1A], Main Classification
  Classification, pgs 36-38
  Explanatory Notes, pgs 38-46
Chapter 29B [1A], Variant Classification
  Shape Configurations Classification, pgs 49-65
  Illustrations, pgs 66-77
  Explanatory Notes, pgs 78-92

International Aeronautical Navigation Aids, Part G, Volume II, 1994

Chapter 34A [2A], Main Classification
  Classification, pgs 60-63
  Explanatory Notes, pgs 63-71
Chapter 34B/34C [2B, 2C], Variant Classification &
  Pictorial Representations
    Classification, pgs 60-63
    Explanatory Notes, pgs 63-71
    Illustrations, pgs 72-77

4B2 Adjunct Classification [Category and Alphabetical Indexes Serving as Adjunct Classification]

Transportation-Markings: Database: Marine A/N, Part Ii 2nd ed. 2007

Chapter 1A, Indexes: Category, pgs 15-27
Alphabetical, pgs 28-41
Chapter 2A, Indexes: Category, pgs 97-106
Alphabetical, pgs 106-118
Chapter 3A, Indexes: Category, pgs 173-177
Alphabetical, pgs 178-182
Chapter 4A, Indexes: Category, pgs 212-219
Alphabetical, pgs 219-227
Chapter 5A, Indexes: Category, pgs 265-271
Alphabetical, pgs 272-279

Transportation-Markings Database: TCD, Part Iii 2nd ed. 2008

Chapter 1A, Indexes: Category, pgs 11-18
Alphabetical, 19-26
Chapter 2A, Indexes: Category, pgs 67-74
Alphabetical, 75-84
Chapter 3A, Indexes: Category, pgs 126-134
Alphabetical, pgs 135-144
Chapter 4A, Indexes: Category, pgs 183-186
Alphabetical, pgs 187-190
Chapter 5A, Indexes: Category, pgs 214-220

Alphabetical, pgs 221-228

Transportation-Markings Database: Railroad Signals,
Part Iiii 2nd ed. 2009

Chapter 1A, Indexes: Category, pgs 17-40
Alphabetical, pgs 41-62
Chapter 2A, Indexes: Category, pgs 172-180
Alphabetical, pgs 180-188
Chapter 3A, Indexes: Category, pgs 230-239
Alphabetical, pgs 240-249
Chapter 4A, Indexes: Category, pgs 287-312
Alphabetical, pgs 313-338

Transportation-Markings Database: Aero Navaids,
Part Iiv 2nd ed. 2009

Chapter 1A, Indexes: Category, pgs 16-46
Alphabetical, pgs 47-75
Chapter 2A, Indexes: Category, pgs 193-209
Alphabetical, pgs 210-225
Chapter 3A, Indexes: Category, pgs 293-315
Alphabetical, pgs 315-335

Transportation-Markings Database: Composite Categories Classification & Index Part v
Part Iv 2006

4B3 Nomenclature & General Classification Materials

T-M Foundations, Part A, 5th ed. 2008

Nomenclature:
Ch 1C, pgs 51-54
General Classification Materials
Ch 1A, pg 40
Ch 1B, pgs 48-51

A First Study ..., Part B, 2nd ed., 1992

Nomenclature:
Ch 7B [1B], pgs 17-21; see also pgs 13-17
General Classification Materials:
Ch 7B [1B], pgs 7-11, 13-17

Marine Aids to Navigation, Parts C/D, 3rd ed. 2010

General Classification Materials:
Ch 1, pg 20

Traffic Control Devices, Part E, 2nd ed. 2004

Nomenclature:
Ch 2A, pgs 59-64
General Classification Materials:
Ch 2A, pgs 59-79

Appendix I, pgs 168-170

Railway Signals, Part F, 1991

Nomenclature:
Ch 29A [2A], pgs 35, 48
General Classification Materials:
Ch 29A [2A], pgs 33-35
Ch 29B [2A], pgs 47, 66-67

Aero Navigation Aids, Part G 1994

Nomenclature:
Ch 34A [2A], pg 50
General Classification Materials:
Ch 34A [2A], pgs 49-51

"Every creature gives him voice, expresses him, proclaims him by its concrete essence as atom, stone, energy, or spirit. We all belong to the family of God, and in that family there are no second-rank members."

Jäger, *The Way to Contemplation: Encountering God Today*, 1986, 72.

APPENDIX

TRANSPORTATION-MARKINGS PSALM/CANTICLE

I

All You Floating Aids Praise the Lord

i

Lighted Buoys with fixed,
flashing and occulting
messages,

Can, Conical, Pillar and
Spherical

Singular Forms from Russia
America, Norway, Germany,
Greece, Canada and Thailand

ii

Unlighted buoys with silent
messages of colors, letters,
numbers and topmarks

Conicals, Nuns, and Variations
from Denmark, Italy, Poland,
France, Canada, and America

iv

Buoys with sound and light,
Can, Conical, Spherical in
Form,

Singular forms from Canada,
America

v

All You Large Floating Aids
Praise the Lord with lighted,
hooting, and silent messages

Lightships, Lightfloats and
Lightvessels, Lighted
Catamarans, and Large
Navigational Buoys

And a rare Electronic Buoy
and numerous radar reflectors

II

All You Daybeacons Praise the Lord
with shape and color and
symbol,

Cans and Cylindricals, and
altered forms from Canada,
Denmark, Germany, Russia,
Sweden, Taiwan, and America

Spars, straight, tapered,
pointed, modifications from
Canada, Norway and the
United States

Variations atop cans and
triangles and composites
from Germany, Iceland,
The Netherlands, and
Poland

Barrels, Beacon-buoys,
Casks, Oil drums, Ogivals,
Pillars, Sphericals and
Spindles without lights

iii

Sound Buoys with a message
often clamorous, clanging,
chiming, gonging, whistling
or of pure tone

Bell, Carillon, Gong, Horn,
and Whistle

i

Bakes, Dolphins, Frameworks,
Lattice Works, Multiple Piles,
Skeleton Towers, Tripods

ii

Edgemarks, Perches, Piles,
Poles, Posts, Spindles, and
Stakes

iii

Cairns, Small Trees, Stone
Constructions, Tree Branches
tied and untied, Structures
Pyramidal and Triangular

iv

Daymarks alone and Daymarks
with Structures

III

All You Fixed Fog Signals Praise
the Lord with Cacaphony of
Sound,

i

Diaphones, regular and two-tone
Diaphragms, Compressed Air,
Oscillator, Nautophone and
Chime, Explosive and Guns,

ii

Bells, Gongs, Reed Horns,
Sirens, and Whistles,

Submarine bells and
Oscillators,

IV

All You Marine Electronic Aids to
Navigation Praise the Lord,
with pulse generated visual
and sound messages

i

Radiobeacons, Racons,
Ramarks, Radar Reflectors

ii

Hyperbolic Radionavigation
systems, Loran, Decca,

Omega, Consol

iii

Satellite Navigation,
GPS, DGPS

V

All You Lighthouses Praise the Lord
with great structures and
piercing lights

i

Sea-girt Towers on rocks,
submerged and above waters,
on skeleton structures, on
off-shore platforms, and
caissons

ii

Land-based Lighthouses on
ocean-edged shore, on
promontories and headlands,
towers, skeleton, framework
and solid

iii

Now-tower and composite structures, houses, skeleton structures, houses on structures, towers attached to houses and buildings

VI

All You River, Harbor and Bay Lights Praise the Lord with small flashes and muted structure

i

Dolphins, Pile Structures marine and land, Pyramids, Skeleton structures, Tripods, Towers skeleton, tripodal and tubular

ii

Arms, Buoyant Beacons, Columns, Masts, Pedestals, Pillars, Pipe, Obelisks, Poles, Posts, Pylons, Single Piles, Spars, Spindles, Stakes, Stands,

iii

Huts, Small Houses, Cairns,
Cylinders, Houses and Huts
on structures, and on tripods

VII

All You Lighted Aeronautical
Navigation Aids Praise the
Lord

i

Beacons with flashing and
rotating messages

Code, and Identification, and
Beacons at airports, heliports,
seadromes, stolports and
vertiports

ii

Runway and Taxiway lights
with fixed lighted messages,
omnidirectional, unidirectional
bidirectional in varied hues

Runway Inset Lights, Edge,
Centerline, Threshold,
Touchdown and End Lights

Taxiway Inset Lights,
at intersection, on
straight and curved sections

iii

Runway and Taxiway Elevated
lights for edge, threshold,
holding position, stopway,
stop, caution and clearance bars

Final Approach and Take-off
Area Lights, and Touchdown
and Lift-off Area Lights

iv

Approach lighting with fixed
messages in low, medium and
high intensity

Approach lighting in simplified
and precision modes, with
acronymic modes of ALSF,
SSALS, ODALS, MALS,
omnidirectional and
unidirectional forms,

halogen and PAR lamps

Joined by sequence flasher lamps with rapid flashing message: RTILS, REILS RILS, RAILS, LDIN

v

Visual Glidescope Indicators, with precise messages in two colors, three colors, patterns, pulses, alignments,

VASI, AVASIS, SAVASIS, T-VASIS and AT-VASIS,

PAPI, APAPI, MINI-PAPI, H-PAPI, CHAPI, T-PASI

PLASI, Heli-PLASI, Hapi-PLASI

FLOLS, Glissada, MDLA, Alignment of Elements

Approach Azimuth Guidance (SAGA), Glide Path Indicator, Optical Localizer, Angle of Approach Indicator

vi

Obstruction lighting with
fixed, rotating, and flashing
messages, in low, medium,
and high intensity, lamps
incandescent, cold-cathode,
mercury, neon, and strobe

vii

Aids with messages lighted
and moving

Wind Indicators, Wind Tees,
and Tetrahedrons

VIII

All You Aero Electronic
Devices Praise the Lord
with visual and sound
enhanced silent pulses

i

Consol, DME, Loran-C,
Enroute Marker Beacons,
Non-directional Beacons,
TACAN, VOR, VORTAC,

Satellite Navigation with
GPS and DGPS

ii

ILS with Localizer, with
Glide Path, and Marker
Beacons,

MLS with Azimuth and
Elevation Stations, and DME

IX

All You Aero Unlighted Aids
Praise the Lord with color
and stripes, bands, checks,
chevrons, solids and
alphanumeric graphics

i

Runway Surface Markings,
Aiming Point Markers,
Centerline, Designation,
Chevron, Edge, Shoulders,
Threshold, Touchdown Zone,
Side Stripes Markings

ii

Taxiway and other Surface
Markings, Centerline Checkpoint,
Edge Holding Position and
Intersections, Blast Pads,
Over-runs, Stopways,
Fixed Distance, Geographic
Position, Shoulder Markings

iii

Helicopter Markings,
for winching, identification
mass, final approach,
down, name, helideck,
taxiway

iv

Obstruction Markings, Solid,
Band, and Checkerboard
Patterns, Spherical and
Flag Markers

v

Mandatory Instruction signs,
Information signs, Aerodrome
and Aircraft Stand signs,
Identification signs, Holding

position signs, Signs under
the guise of markers, Signs
lighted for night use

vi

Markers for unpaved runway
and taxiway centerlines, edges,
boundaries, stopways,
snow-covered runway edges

Elevated markers, natural and
assembled, Trees, Stones, Hedges,
Flower beds, Cones, Fences,
Flags, Drums, Tripods, Boards

Low-elevated Markers, Inset,
Inpavement, Retroreflective,
Stone, Concrete Slabs

X

All You Lighted Railway Signals
Praise the Lord with fixed and
flashing, simple and complex
messages,

i

Color-light, multiple and
searchlight lenses, Position,

Color-position, Graphic and
Alphanumeric symbols,
Full-sized and dwarf, mainline,
siding and yard

ii

Cab-signals, light and sound,
colors and numbers and digital

XI

All Your Mechanical signals
Praise the Lord
with messages rotating and
revolving, hinged, ascending
and descending

i

Semaphores, straight and
tapered, with pointed
swallow-tailed, square and
rounded ends, with blade
and spectacle unified, and
split apart

ii

Board signals rotating,
hinged, and stationary, with
diamonds, triangles, squares

and circles

iii

Dwarf signals with discs,
blades and geometric facades,

Semaphores, Disc-semaphores,
Pillar-discs, and Panels

Discs with internal lamps and
flood-lamps, Rotating and
Revolving,

Graphics miniature and large,
internally and externally
lighted,

Targets by color, shaped
position, single and double,
obrounds, diamond, octagons,
circles, squares, triangle,
rectangles, masks, ovals,
arrows

iv

Movable signals, Staffs,
Tickets, Tokens and Tablets

XII

All You Signs and Markings
Praise the Lord
with silent messages of color,
shape, graphic and alphanumeric
symbols

i

Signs, lighted and unlighted,
Approach, Speed, Whistle Posts,
Mileage Posts, Location,
Station, Yard, Block and Traction,
Section, Sign and Signal
Identification, Flags, Plates,
Stop Boards

ii

Markings, Pillars and Posts,
Petites, Marker Boards and
Sign-like Objects

XIII

All You Traffic Signals Praise the
Lord, with color, graphic and
alternating messages

i

Traffic light signals and
Pedestrian signals

ii

Cyclist Signals, Lane use
Signals, Railway Crossing
Signals, and Bridge, Ferry
Landing, Fire, Low flying
Aircraft, Ramp Control and
School Signals

Flashing Beacons for Hazard
Identification, Intersection
Control, Speed Limits and
Stop Signs

Lighting devices, all-lighted
and partially-lighted, Warning
Beacons and Lights, Steady-
Burning Lamps

XIV

All You Traffic Signs Praise the
Lord with Silent Messages of
color, shape and symbol

i

Warning Signs for bends left,
right, singles and doubles,
narrowing roads, moveable
bridges, roads on quays
and river edges

Warning Signs for roads uneven
and slippery, loose gravel,
falling rocks and cross
winds

Warning Signs for pedestrians,
children, cyclists, cattle, animals
wild and domestic crossings

Warning Signs for road works,
traffic signals, airfields,
two-way traffic, cross roads,
railway crossings, stop
signs and yield

ii

Informative Signs for
directions and advance
directions, confirmatory,
place identification and
pedestrian crossings

Informative Signs for
useful information for
motorists, of faculties,
about parking

iii

Regulatory signs, priority,
prohibitory, and mandatory

Priority Signs for yield,
stop, priority of road,
oncoming traffic and
priority over oncoming
traffic

iv

Prohibitory and Restrictive
Signs for no entry at all,
no entry for some, closed to
vehicles in both directions

No turns right, left and "u"
prohibitions on passing,
no passing for freight

maximum limits on speeds,
end of prohibitions, end of
speed restrictions, and those

for passing

v

Mandatory signs for direction
to be followed, for passing
this side

Compulsory signs for roundabouts,
cycle tracks, foot-path, horseback
riders, minimum speed, and end
of minimum speed, for snow
chains

vi

Signs for prohibiting and
restricting standing and
parking, for providing useful
information on parking

XV

All You Traffic Markings Praise
the Lord with graphics of color,
line, word and line, word
and number

i

Longitudinal markings for

traffic lanes, carriageway limits,
obstructions, and turning
guide lines

Transverse lines for stop,
yield, cyclists, and pedestrians

Standing and parking
markings, arrows, oblique
parallel lines, and
alphanumeric symbols

ii

Object Markings, within
roadways, adjacent to
roadways, end of roadways

Delineators, Barricades,
Channelizing Devices, and
Colored Pavements

XVI

All You Sound Signals Praise
the Lord
with bells, whistles,
bird calls, chimes,
buzzers, beepers

Movable Bridges, Audible

NOTE

This "psalm" (or "canticle") was originally formulated during a 1991 sabbatical. It was an outgrowth of a joint focus on T-M and the theology of creation. It is influenced by the format and content of the creation canticle of the Book of Daniel 3:52-90. That canticle can be viewed as an expansion of Psalm 148. It includes many forms of markings though in a form well removed from formal classifications. It too classifies markings even if by different principles. Some forms of T-M in this psalm are not mentioned specifically in Chs 1 and 2. However, they are found in the explanatory notes of other monographs of the Series.

Technology is often only infrequently included -- or even alluded to -- in the theology of creation. Some of those allusions and references are reflected in the quotes included in this monograph. This "psalm" is a portrayal of technical beings as participants in the universal praise of the Creator by creation. The psalm remains a tentative and provisional endeavor. Nonetheless, it provides an appropriate conclusion to the descriptive mode-specific monographs.

"Bless the Lord, all you works of the Lord,
praise and exalt him above all forever."
Book of Daniel 3:57
New American Bible 1970, 1026

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- A listing of organizations publishing T-M information.
- The bibliographies in other T-M monographs can also be consulted.

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"A writer's path includes concentration, slowing down, commitment, awareness, loneliness, faith, a breakdown of ordinary perceptions -- the same qualities attributed to monks or Zen masters.

Natalie Goldberg, *Thunder and Lightning: Cracking Open the Writer's Craft*. 2000, 44.

GENERAL INDEX

i Terms

ii General T-M Terms [Non-mode Specific]

iii Names

i Marine

Transportation-Markings: A Study in Communication Monograph Series

Transportation-Marking: Any device that aids a transportation mode (road, rail, aero, marine) by giving guidance, by expressing regulations, or by providing warnings.

Transportation-Markings: An approved Library of Congress Subject Heading.

Transportation-Markings: **NOT** a synonym for road/pavement/traffic/ carriageway markings. Pavement and other forms of markings are components of Transportation-Markings.

Transportation Markings has become Transportation-Markings to better indicate that **T-M** represents a unified perspective for all safety aids.

T-M: a historical, semiotic, communication and taxonomic study in an integrative, systematic and holographic framework.

Alternate Title: T-M: An Inter-modal Study of Safety Aids.

Alternate Terms: Transport Marks, Safety Aids, Transportation Control Devices, Waymarks.

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