

Ciência e Tecnologia

Para o Desenvolvimento
Ambiental, Cultural
e Socioeconômico

Xosé Somoza Medina
(organizador)

VOL VI

 EDITORA
ARTEMIS
2025

Ciência e Tecnologia

Para o Desenvolvimento Ambiental, Cultural e Socioeconômico

Xosé Somoza Medina
(organizador)

VOL VI

 EDITORA
ARTEMIS
2025



O conteúdo deste livro está licenciado sob uma Licença de Atribuição Creative Commons Atribuição-Não-Comercial NãoDerivativos 4.0 Internacional (CC BY-NC-ND 4.0). Direitos para esta edição cedidos à Editora Artemis pelos autores. Permitido o download da obra e o compartilhamento, desde que sejam atribuídos créditos aos autores, e sem a possibilidade de alterá-la de nenhuma forma ou utilizá-la para fins comerciais.

A responsabilidade pelo conteúdo dos artigos e seus dados, em sua forma, correção e confiabilidade é exclusiva dos autores. A Editora Artemis, em seu compromisso de manter e aperfeiçoar a qualidade e confiabilidade dos trabalhos que publica, conduz a avaliação cega pelos pares de todos manuscritos publicados, com base em critérios de neutralidade e imparcialidade acadêmica.

Editora Chefe	Prof. ^a Dr. ^a Antonella Carvalho de Oliveira
Editora Executiva	M. ^a Viviane Carvalho Mocellin
Direção de Arte	M. ^a Bruna Bejarano
Diagramação	Elisangela Abreu
Organizador	Prof. Dr. Xosé Somoza Medina
Imagem da Capa	peacestock/123RF
Bibliotecário	Maurício Amormino Júnior – CRB6/2422

Conselho Editorial

Prof.^a Dr.^a Ada Esther Portero Ricol, *Universidad Tecnológica de La Habana “José Antonio Echeverría”*, Cuba
Prof. Dr. Adalberto de Paula Paranhos, Universidade Federal de Uberlândia, Brasil
Prof. Dr. Agustín Olmos Cruz, *Universidad Autónoma del Estado de México*, México
Prof.^a Dr.^a Amanda Ramalho de Freitas Brito, Universidade Federal da Paraíba, Brasil
Prof.^a Dr.^a Ana Clara Monteverde, *Universidad de Buenos Aires*, Argentina
Prof.^a Dr.^a Ana Júlia Viamonte, Instituto Superior de Engenharia do Porto (ISEP), Portugal
Prof. Dr. Ángel Mujica Sánchez, *Universidad Nacional del Altiplano*, Peru
Prof.^a Dr.^a Angela Ester Mallmann Centenaro, Universidade do Estado de Mato Grosso, Brasil
Prof.^a Dr.^a Begoña Blandón González, *Universidad de Sevilla*, Espanha
Prof.^a Dr.^a Carmen Pimentel, Universidade Federal Rural do Rio de Janeiro, Brasil
Prof.^a Dr.^a Catarina Castro, Universidade Nova de Lisboa, Portugal
Prof.^a Dr.^a Cirila Cervera Delgado, *Universidad de Guanajuato*, México
Prof.^a Dr.^a Cláudia Neves, Universidade Aberta de Portugal
Prof.^a Dr.^a Cláudia Padovesi Fonseca, Universidade de Brasília-DF, Brasil
Prof. Dr. Cleberton Correia Santos, Universidade Federal da Grande Dourados, Brasil
Dr. Cristo Ernesto Yáñez León – New Jersey Institute of Technology, Newark, NJ, Estados Unidos
Prof. Dr. David García-Martul, *Universidad Rey Juan Carlos de Madrid*, Espanha
Prof.^a Dr.^a Deuzimar Costa Serra, Universidade Estadual do Maranhão, Brasil
Prof.^a Dr.^a Dina Maria Martins Ferreira, Universidade Estadual do Ceará, Brasil
Prof.^a Dr.^a Edith Luévano-Hipólito, *Universidad Autónoma de Nuevo León*, México
Prof.^a Dr.^a Eduarda Maria Rocha Teles de Castro Coelho, Universidade de Trás-os-Montes e Alto Douro, Portugal
Prof. Dr. Eduardo Eugênio Spers, Universidade de São Paulo (USP), Brasil
Prof. Dr. Eloi Martins Senhoras, Universidade Federal de Roraima, Brasil
Prof.^a Dr.^a Elvira Laura Hernández Carballido, *Universidad Autónoma del Estado de Hidalgo*, México

Prof.^a Dr.^a Emilas Darlene Carmen Lebus, *Universidad Nacional del Nordeste/ Universidad Tecnológica Nacional*, Argentina

Prof.^a Dr.^a Erla Mariela Morales Morgado, *Universidad de Salamanca*, Espanha

Prof. Dr. Ernesto Cristina, *Universidad de la República*, Uruguay

Prof. Dr. Ernesto Ramírez-Briones, *Universidad de Guadalajara*, México

Prof. Dr. Fernando Hitt, *Université du Québec à Montréal*, Canadá

Prof. Dr. Gabriel Díaz Cobos, *Universitat de Barcelona*, Espanha

Prof.^a Dr.^a Gabriela Gonçalves, Instituto Superior de Engenharia do Porto (ISEP), Portugal

Prof.^a Dr.^a Galina Gumovskaya – Higher School of Economics, Moscow, Russia

Prof. Dr. Geoffroy Roger Pointer Malpass, Universidade Federal do Triângulo Mineiro, Brasil

Prof.^a Dr.^a Gladys Esther Leoz, *Universidad Nacional de San Luis*, Argentina

Prof.^a Dr.^a Glória Beatriz Álvarez, *Universidad de Buenos Aires*, Argentina

Prof. Dr. Gonçalo Poeta Fernandes, Instituto Politécnico da Guarda, Portugal

Prof. Dr. Gustavo Adolfo Juarez, *Universidad Nacional de Catamarca*, Argentina

Prof. Dr. Guillermo Julián González-Pérez, *Universidad de Guadalajara*, México

Prof. Dr. Håkan Karlsson, *University of Gothenburg*, Suécia

Prof.^a Dr.^a Iara Lúcia Tescarollo Dias, Universidade São Francisco, Brasil

Prof.^a Dr.^a Isabel del Rosario Chiyon Carrasco, *Universidad de Piura*, Peru

Prof.^a Dr.^a Isabel Yohena, *Universidad de Buenos Aires*, Argentina

Prof. Dr. Ivan Amaro, Universidade do Estado do Rio de Janeiro, Brasil

Prof. Dr. Iván Ramon Sánchez Soto, *Universidad del Bío-Bío*, Chile

Prof.^a Dr.^a Ivânia Maria Carneiro Vieira, Universidade Federal do Amazonas, Brasil

Prof. Me. Javier Antonio Alborno, *University of Miami and Miami Dade College*, Estados Unidos

Prof. Dr. Jesús Montero Martínez, *Universidad de Castilla - La Mancha*, Espanha

Prof. Dr. João Manuel Pereira Ramalho Serrano, Universidade de Évora, Portugal

Prof. Dr. Joaquim Júlio Almeida Júnior, UniFIMES - Centro Universitário de Mineiros, Brasil

Prof. Dr. Jorge Ernesto Bartolucci, *Universidad Nacional Autónoma de México*, México

Prof. Dr. José Cortez Godínez, Universidad Autónoma de Baja California, México

Prof. Dr. Juan Carlos Cancino Díaz, Instituto Politécnico Nacional, México

Prof. Dr. Juan Carlos Mosquera Feijoo, *Universidad Politécnica de Madrid*, Espanha

Prof. Dr. Juan Diego Parra Valencia, *Instituto Tecnológico Metropolitano de Medellín*, Colômbia

Prof. Dr. Juan Manuel Sánchez-Yáñez, *Universidad Michoacana de San Nicolás de Hidalgo*, México

Prof. Dr. Juan Porras Pulido, *Universidad Nacional Autónoma de México*, México

Prof. Dr. Júlio César Ribeiro, Universidade Federal Rural do Rio de Janeiro, Brasil

Prof. Dr. Leinig Antonio Perazolli, Universidade Estadual Paulista (UNESP), Brasil

Prof.^a Dr.^a Livia do Carmo, Universidade Federal de Goiás, Brasil

Prof.^a Dr.^a Luciane Spanhol Bordignon, Universidade de Passo Fundo, Brasil

Prof. Dr. Luis Fernando González Beltrán, *Universidad Nacional Autónoma de México*, México

Prof. Dr. Luis Vicente Amador Muñoz, *Universidad Pablo de Olavide*, Espanha

Prof.^a Dr.^a Macarena Esteban Ibáñez, *Universidad Pablo de Olavide*, Espanha

Prof. Dr. Manuel Ramiro Rodriguez, *Universidad Santiago de Compostela*, Espanha

Prof. Dr. Manuel Simões, Faculdade de Engenharia da Universidade do Porto, Portugal

Prof.^a Dr.^a Márcia de Souza Luz Freitas, Universidade Federal de Itajubá, Brasil

Prof. Dr. Marcos Augusto de Lima Nobre, Universidade Estadual Paulista (UNESP), Brasil

Prof. Dr. Marcos Vinicius Meiado, Universidade Federal de Sergipe, Brasil

Prof.^a Dr.^a Mar Garrido Román, *Universidad de Granada*, Espanha

Prof.^a Dr.^a Margarida Márcia Fernandes Lima, Universidade Federal de Ouro Preto, Brasil

Prof.^a Dr.^a María Alejandra Arecco, *Universidad de Buenos Aires*, Argentina

Prof.^a Dr.^a Maria Aparecida José de Oliveira, Universidade Federal da Bahia, Brasil

Prof.^a Dr.^a Maria Carmen Pastor, *Universitat Jaume I*, Espanha

Prof.^ª Dr.^ª Maria da Luz Vale Dias – Universidade de Coimbra, Portugal
 Prof.^ª Dr.^ª Maria do Céu Caetano, Universidade Nova de Lisboa, Portugal
 Prof.^ª Dr.^ª Maria do Socorro Saraiva Pinheiro, Universidade Federal do Maranhão, Brasil
 Prof.^ª Dr.^ª M^ªGraça Pereira, Universidade do Minho, Portugal
 Prof.^ª Dr.^ª Maria Gracinda Carvalho Teixeira, Universidade Federal Rural do Rio de Janeiro, Brasil
 Prof.^ª Dr.^ª María Guadalupe Vega-López, *Universidad de Guadalajara, México*
 Prof.^ª Dr.^ª Maria Lúcia Pato, Instituto Politécnico de Viseu, Portugal
 Prof.^ª Dr.^ª Maritza González Moreno, *Universidad Tecnológica de La Habana, Cuba*
 Prof.^ª Dr.^ª Mauriceia Silva de Paula Vieira, Universidade Federal de Lavras, Brasil
 Prof. Dr. Melchor Gómez Pérez, Universidad del País Vasco, Espanha
 Prof.^ª Dr.^ª Ninfa María Rosas-García, Centro de Biotecnología Genómica-Instituto Politécnico Nacional, México
 Prof.^ª Dr.^ª Odara Horta Boscolo, Universidade Federal Fluminense, Brasil
 Prof. Dr. Osbaldo Turpo-Gebera, *Universidad Nacional de San Agustín de Arequipa, Peru*
 Prof.^ª Dr.^ª Patrícia Vasconcelos Almeida, Universidade Federal de Lavras, Brasil
 Prof.^ª Dr.^ª Paula Arcoverde Cavalcanti, Universidade do Estado da Bahia, Brasil
 Prof. Dr. Rodrigo Marques de Almeida Guerra, Universidade Federal do Pará, Brasil
 Prof. Dr. Saulo Cerqueira de Aguiar Soares, Universidade Federal do Piauí, Brasil
 Prof. Dr. Sérgio Bitencourt Araújo Barros, Universidade Federal do Piauí, Brasil
 Prof. Dr. Sérgio Luiz do Amaral Moretti, Universidade Federal de Uberlândia, Brasil
 Prof.^ª Dr.^ª Silvia Inés del Valle Navarro, *Universidad Nacional de Catamarca, Argentina*
 Prof.^ª Dr.^ª Solange Kazumi Sakata, Instituto de Pesquisas Energéticas e Nucleares (IPEN)- USP, Brasil
 Prof.^ª Dr.^ª Stanislava Kashtanova, *Saint Petersburg State University, Russia*
 Prof.^ª Dr.^ª Susana Álvarez Otero – Universidad de Oviedo, Espanha
 Prof.^ª Dr.^ª Teresa Cardoso, Universidade Aberta de Portugal
 Prof.^ª Dr.^ª Teresa Monteiro Seixas, Universidade do Porto, Portugal
 Prof. Dr. Valter Machado da Fonseca, Universidade Federal de Viçosa, Brasil
 Prof.^ª Dr.^ª Vanessa Bordin Viera, Universidade Federal de Campina Grande, Brasil
 Prof.^ª Dr.^ª Vera Lúcia Vasilévski dos Santos Araújo, Universidade Tecnológica Federal do Paraná, Brasil
 Prof. Dr. Wilson Noé Garcés Aguilar, *Corporación Universitaria Autónoma del Cauca, Colômbia*
 Prof. Dr. Xosé Somoza Medina, *Universidad de León, Espanha*

Dados Internacionais de Catalogação na Publicação (CIP) (eDOC BRASIL, Belo Horizonte/MG)

C569 Ciência e tecnologia para o desenvolvimento ambiental, cultural e socioeconômico VI [livro eletrônico] / Organizador Xosé Somoza Medina. – Curitiba, PR: Artemis, 2025.

Formato: PDF

Requisitos de sistema: Adobe Acrobat Reader

Modo de acesso: World Wide Web

Inclui bibliografia

Edição bilíngue

ISBN 978-65-81701-51-2

DOI 10.37572/EdArt_290525512

1. Desenvolvimento sustentável. 2. Tecnologia – Aspectos ambientais. I. Somoza Medina, Xosé.

CDD 363.7

Elaborado por Maurício Amormino Júnior – CRB6/2422



PRÓLOGO

La ciencia y la tecnología siguen siendo fuerzas impulsoras de las transformaciones sociales, culturales y ambientales de nuestro tiempo. Al mismo tiempo que responden a desafíos urgentes del presente, también iluminan caminos hacia futuros más sostenibles, más justos e inteligentes. Esta recopilación nace precisamente de ese impulso: el de pensar, crear y proponer soluciones a partir de la investigación científica y la innovación tecnológica, en diálogo con las realidades locales y los contextos globales.

Reunimos en ***Ciência e Tecnologia para o Desenvolvimento Ambiental, Cultural e Socioeconômico VI*** artículos de investigadores e investigadoras de distintas partes del mundo, comprometidos con la producción de un conocimiento riguroso, interdisciplinario y sensible a la complejidad de los temas contemporáneos. Los trabajos presentados abordan una amplia gama de cuestiones – desde la nanotecnología hasta la agricultura de precisión, desde la física aplicada hasta la expresión lingüística – conformando un panorama diverso que refleja los múltiples caminos de la ciencia en el siglo XXI.

Organizados en cuatro ejes temáticos – *Tecnología e Innovación en Salud e Industria, Ingeniería, Física Aplicada y Recursos Naturales, Sustentabilidad Agrícola y Transformaciones Climáticas, y Lenguaje, Cognición y Expresión Científica* – los textos aquí reunidos nos invitan a reflexionar sobre preguntas centrales de nuestro tiempo: ¿Cómo garantizar el acceso equitativo a las nuevas tecnologías médicas? ¿Cómo integrar soluciones de ingeniería a las urgencias ambientales? ¿De qué manera puede el avance agrícola responder al cambio climático sin agotar los recursos naturales? ¿Y cómo influye el lenguaje en la forma en que comprendemos y comunicamos el conocimiento científico?

Más que ofrecer respuestas definitivas, esta obra propone caminos para la reflexión y la acción, abriendo espacio para nuevas investigaciones, debates y colaboraciones. Cada autor y autora aporta una perspectiva única, y juntas estas voces amplían nuestra comprensión del papel transformador de la ciencia y la tecnología en el mundo contemporáneo.

Que este nuevo libro sea, para lectoras y lectores, una invitación a la curiosidad crítica, al pensamiento creativo y a la construcción de futuros posibles. Agradecemos a todos los involucrados por su confianza, dedicación y generosidad intelectual.

Xosé Somoza Medina

Universidad de León, Espanha

SUMÁRIO

TECNOLOGIA E INOVAÇÃO EM SAÚDE E INDÚSTRIA

CAPÍTULO 1..... 1

NAVEGANDO LOS DESAFÍOS EN LA NANOMEDICINA: ÉTICA, ACCESO Y PARTICIPACIÓN PÚBLICA

Jade Cristi Rivera Rossi

 https://doi.org/10.37572/EdArt_2905255121

CAPÍTULO 2..... 7

APLICACIÓN DE LA ELECTRICIDAD Y LA ELECTRÓNICA EN LA INGENIERÍA INDUSTRIAL: INTEGRACIÓN DE SENSORES, ELECTRO-NEUMÁTICA Y CONTROLADORES LÓGICOS PROGRAMABLES

Miguel Ángel Quiroz García

María del Carmen Nolasco Mata

Marycarmen Arana Altamirano

Violeta del Rocío Hernández Campos

Raymundo Escalante Wong

 https://doi.org/10.37572/EdArt_2905255122

ENGENHARIA, FÍSICA APLICADA E RECURSOS NATURAIS

CAPÍTULO 3..... 21

SOLUCIÓN A LA ECUACIÓN DE ONDA PROPAGADA RADIALMENTE PARA EL CAMPO ELÉCTRICO EN COORDENADAS CILÍNDRICAS

Esteban Andrés Zárate

Mateo Márquez Arias

Israel Benjamín Sánchez Jiménez

Quintiliano Angulo Córdova

 https://doi.org/10.37572/EdArt_2905255123

CAPÍTULO 4..... 31

ANÁLISIS COMPARATIVO DE LAS VARIACIONES DEL COMPORTAMIENTO DEL FUEGO, DURANTE UNA QUEMA PRESCRITA

José German Flores-Garnica

 https://doi.org/10.37572/EdArt_2905255124

CAPÍTULO 5..... 46

DIAGNÓSTICO EXPERIMENTAL DO PROBLEMA DE REBAIXAMENTO DAS ÁGUAS SUBTERRÂNEAS NA REGIÃO DE BISKRA (ARGÉLIA)

Abderrahmane Noui

Zineb Guesbaya

 https://doi.org/10.37572/EdArt_2905255125

SUSTENTABILIDADE AGRÍCOLA E TRANSFORMAÇÕES CLIMÁTICAS

CAPÍTULO 6..... 60

BREEDING DROUGHT RESISTANCE AND HEAT TOLERANCE TO MITIGATE CLIMATIC CHANGE EFFECTS ON CROPS

Cándido López-Castañeda

 https://doi.org/10.37572/EdArt_2905255126

CAPÍTULO 7..... 68

CULTIVARES DE COENTRO FERTILIZADO COM A MISTURA DE ADUBOS ORGÂNICOS INCORPORADO AO SOLO NA REGIÃO SEMIÁRIDA 68

Paulo César Ferreira Linhares

Patrício Borges Maracajá

Aline Carla de Medeiros

José Nilson de Matos Fernandes

Lunara de Sousa Alves

Karen Geovana da Silva Carlos

Joaquim Odilon Pereira

Walter Martins Rodrigues

Fagno Dallino Rolim

Sonally Yasnara Sarmiento Medeiros Abrantes

Ordânio Pereira de Almeida

Maria Eduarda Sarmiento Medeiros Abrantes

 https://doi.org/10.37572/EdArt_2905255127

CAPÍTULO 8.....82

ADUBAÇÃO ORGÂNICA COM FLOR-DE-SEDA (*Calotropis procera*) EM ADIÇÃO COM ESTERCO BOVINO NA PRODUÇÃO DE RABANETE

Paulo César Ferreira Linhares

Lunara de Sousa Alves

Wyara Ferreira Melo

Aline Carla de Medeiros
Joaquim Odilon Pereira
Walter Martins Rodrigues
Karen Geovana da Silva Carlos
Sonally Yasnara Sarmiento Medeiros Abrantes
Maria Eduarda Sarmiento Medeiros Abrantes
Andressa Pedroza Pereira da Silva
Ordânio Pereira de Almeida
Fagno Dallino Rolim
Francisco Andesson Bezerra da Silva

 https://doi.org/10.37572/EdArt_2905255128

CAPÍTULO 9.....92

AGRICULTURA DE PRECISÃO E FORMAÇÃO DIGITAL: O PAPEL TRANSFORMADOR
DOS AGRICULTORES NO PROJETO HIBA

Elsa da Piedade Chinita Soares Rodrigues

 https://doi.org/10.37572/EdArt_2905255129

CAPÍTULO 10.....107

INFLUENCIA DE LA CONCENTRACIÓN DE ARSÉNICO EN LA TRANSFERENCIA DE
MATERIA EN ZANAHORIAS COCIDAS

Oscar Daniel Galvez
Mariela Beatriz Maldonado
Juan Ignacio González Pacheco

 https://doi.org/10.37572/EdArt_29052551210

LINGUAGEM, COGNIÇÃO E EXPRESSÃO CIENTÍFICA

CAPÍTULO 11..... 116

THE EXPRESSION TECHNIQUES OF “IRREVOCABLE SADNESS” AND “INVISIBILITY”:
BRAUTIGAN’S POETICS AS UNVERBALIZED ABSENCE THE SYMBOLIC FUNCTION
OF SPECIFIC NUMBERS (3003, 45, 33) AND THE INTERSECTION OF CYCLICAL
TIME, ETERNAL PRESENT, AND POETIC NUMEROLOGY IN WORKS FROM
EARLY “THE MARBLE TEA” TO FINAL “SO THE WIND WON’T BLOW IT ALL AWAY”
(AMERICAN LITERARY TRENDS 1950S-1980S)

Yasuko Kawahata

 https://doi.org/10.37572/EdArt_29052551211

CAPÍTULO 12138

FROM “NAI” (“NOT”) TO “MIRU” (“TO SEE”): AN ANALYSIS OF THE MULTI-LAYERED
STRUCTURE OF LINGUISTIC RHYTHMS – TRACING THE FORMATION OF THE
DIGITAL PUBLIC SPHERE AND SOCIAL SYNCHRONIZATION PHENOMENA THROUGH
BASIC JAPANESE VOCABULARY FROM JANUARY 2011 TO MARCH 2015 –

Yasuko Kawahata



https://doi.org/10.37572/EdArt_29052551212

SOBRE O ORGANIZADOR..... 161

ÍNDICE REMISSIVO162

CAPÍTULO 11

THE EXPRESSION TECHNIQUES OF “IRREVOCABLE SADNESS” AND “INVISIBILITY”: BRAUTIGAN’S POETICS AS UNVERBALIZED ABSENCE THE SYMBOLIC FUNCTION OF SPECIFIC NUMBERS (3003, 45, 33) AND THE INTERSECTION OF CYCLICAL TIME, ETERNAL PRESENT, AND POETIC NUMEROLOGY IN WORKS FROM EARLY “THE MARBLE TEA” TO FINAL “SO THE WIND WON’T BLOW IT ALL AWAY” (AMERICAN LITERARY TRENDS 1950S-1980S)

Data de submissão: 07/05/2025

Data de aceite: 19/05/2025

Yasuko Kawahata

Rikkyo University

Graduate School of Sociology

3-34-1 Nishi-Ikebukuro, Toshima-ku

Tokyo, 171-8501, JAPAN

<https://orcid.org/0000-0001-8459-0906>

ABSTRACT: This study examines Richard Brautigan’s distinctive poetic expressions across his literary corpus from early works like “Laying the Marble Tea” (1959) to his final publication “So the Wind Won’t Blow It All Away” (1982). The research focuses on three interconnected aspects of Brautigan’s poetics: his symbolic employment of specific numbers (3003, 45, 33) as cross-textual codes; his non-linear temporal concepts that challenge conventional chronology through “cyclical time” and “eternal present”; and his methodical approach to expressing the ineffable through techniques of “verbally unexpressed absence.” Analysis reveals that Brautigan’s numerical expressions function beyond quantitative indicators as poetic devices with multilayered symbolism, creating a numerical aesthetics that prioritizes subjective experience over

objective certainty. His temporal expressions systematically disrupt linear progression through strategic techniques like point observation, anachronism, and time slice, while his treatment of “irrevocable sadness” operates through intentional textual absences, symbolic substitution, and calculated utilization of blank space. This paper argues that Brautigan’s literary innovations constitute a sustained philosophical critique of conventional frameworks of perception and representation, positioning him not merely as a counterculture figure but as a significant literary innovator whose experimental approach to language offers relevant insights into contemporary questions of memory, loss, and existential meaning.

KEYWORDS: irrevocable sadness; the invisible; symbolic numerology; eternal present; cyclical time; verbally unexpressed absence.

1 INTRODUCTION

This paper analyzes the characteristic poetic expressions in Richard Brautigan’s works (1935-1984), focusing on his unique treatment of numbers, temporal expressions, and approaches to “the invisible.” Examining works such as “Trout Fishing in America” (1967), “The Tokyo-Montana Express” (1978), and “June 30, June 30” (1978), this study

investigates the repetitive use of specific numbers (3003, 45, 33) and the distinctive temporal-spatial expressions that characterize Brautigan's literary world. Analysis reveals that Brautigan's numerical expressions function not merely as quantitative indicators but as poetic "codes" with multilayered symbolism. Furthermore, his works demonstrate two primary temporal concepts – "cyclical time" and "the enduring moment" – through which Brautigan challenges conventional modern, rational, and linear spatiotemporal recognition, exploring more subjective, cyclical, and fragmentary worldviews. Additionally, the paper examines Brautigan's unique approach to "the invisible" and "the inexpressible" as both a critique of the limitations of linguistic expression and an exploration of its possibilities.

1.1 POINT OBSERVATION AS TEMPORAL EXPRESSION: "ETERNAL PRESENT" AND EARLY WORK "LAYING THE MARBLE TEA"

A new perspective on Brautigan's temporal expression introduces the concepts of "point observation" and "eternal present" as key to understanding the poetic and philosophical significance of his temporal representations.

Time philosopher Elizabeth Grant notes that "Brautigan's temporal expressions function as 'point observations' that cut specific moments from flowing time and preserve them permanently." In works like "Revenge of the Lawn," extremely precise time settings freeze particular moments for detailed observation. Grant suggests that "this technique functions similarly to photographic snapshots, extracting and eternalizing moments from constantly changing reality."

Phenomenological critic Janet Lee analyzes the concept of "time slice," observing that "Brautigan cuts the continuous flow of time through temporal expressions and examines its cross-sections in detail." Expressions like "Tokyo at 3:15" in "The Tokyo-Montana Express" present a cross-section of Tokyo at a specific time, prioritizing the multilayered expansion of a moment over narrative development along a timeline.

The concept of "eternal present" is particularly characteristic of the temporal expressions in "Laying the Marble Tea." Literary scholar Paul Martinez notes that "the thorough use of present tense in Brautigan's early poetry demonstrates a strong fixation on the 'here and now' moment." In poems from "Laying the Marble Tea," expressions such as "as of 10:12 AM" reflect attempts to find infinite depth within the present moment rather than in the past or future.

Regarding the "repetition of time" in "June 30, June 30," psychoanalytic critic Anna Winter argues that "the repeated reference to the same time indicates the circularity of time and a compulsive repetitive process of memory." The repetition of specific dates and

times (like “June 30th at 3:27 PM”) disrupts the linear progression of time, foregrounding the experience of time as an enduring moment.

The concept of “relativity of time” relates to expressions in Brautigan’s works that demonstrate the divergence between objective clock time and subjective time experience. Philosopher Martin Held points out that “in Brautigan’s works, there is often a significant gap between the objective time shown by clocks and the quality of time experienced internally by characters.” Time is portrayed as variable, relativized by individual psychological states or emotions, rather than as an absolute standard.

These temporal expressions constitute Brautigan’s poetics of “eternal present.” He explores the quality of subjective time that is experienced, felt, and remembered, rather than mechanical and objective time measured by clocks. Through the technique of “point observation” that freezes and observes specific moments in detail, he seeks to discover permanence and depth within the flow of time.

Table 1. Temporal Expressions and Eternal Present in Brautigan’s Works.

Temporal Concept	Expression Methods and Examples
Point Observation	Detailed observation of the world at specific times. Precise time designations such as “Sad Autobiography at 4:19 PM” in “Revenge of the Lawn.” World depiction as a cross-section of a moment.
Time Slice	Magnification of a moment cut from the continuous flow of time. Expressions like “Tokyo at 3:15” in “The Tokyo-Montana Express.” Slice and reconstruction of reality through specific time points.
Eternal Present	Fixation on the “now” moment, neither past nor future. Sustained use of present tense in “Laying the Marble Tea.” Expressions like “as of 10:12 AM” emphasizing “here and now” experience.
Repetition of Time	Expressions where the same time is repeatedly referenced. Repetition of specific times in “June 30, June 30.” Suggesting circularity of time and perpetuation of specific moments.
Relativity of Time	Expressions showing divergence between objective clock time and subjective time experience. “His clock showed 3 PM, but in her it was still morning.” Relativization of time.

1.2 THE POETICS OF ANACHRONISM: STRATEGIC USE OF ANACHRONISTIC ELEMENTS

A characteristic of temporal expression in Brautigan’s works that has received little attention until now is his strategic use of anachronism. In his works, elements from different

eras are intentionally mixed, prioritizing poetic effect and symbolic meaning over temporal consistency. Cognitive Foundation: Basic vocabulary plays a central role in human cognitive categorization, reflecting fundamental mechanisms of information processing.

Literary historian Edward Saunders points out that “anachronism in Brautigan’s works is not merely an error in historical accuracy but an intentional poetic strategy.” Particularly in “Trout Fishing in America,” modern elements like Coca-Cola and hotel neon signs are abruptly inserted into 19th-century American Western landscape descriptions. According to Saunders, “such anachronistic mixing deconstructs the myth of American historical continuity and creates a multi-layered sense of time where past and present interpenetrate each other.”

Regarding “linguistic anachronism,” linguist Margaret Field analyzes that “Brautigan’s style often intentionally mixes modern slang with old-fashioned expressions, poetic expressions with colloquial expressions.” For example, “Rommel Drives On Deep into Egypt” features a coexistence of World War II military terminology and 1960s counterculture language. Field suggests that “this linguistic anachronism expresses how different eras’ discourses erode each other and challenges the temporal fixity of language.”

Cultural critic Richard Bloom discusses the “historical anachronism” in “Rommel Drives On Deep into Egypt,” arguing that “Brautigan arbitrarily manipulates historical facts and creates historically impossible situations like ‘Rommel and Marilyn Monroe’s picnic,’ thereby challenging assumptions about the objectivity and consistency of historical narratives.” This technique presents history not as a fixed past but as a fluid narrative constantly reconstructed from present perspectives.

An example of “technological anachronism” is the concept of a “trout fishing computer” appearing in “Trout Fishing in America.” Science and technology historian Alan Marks notes that “technological anachronism in Brautigan’s works ignores the historical development process of technology and instead focuses on the existential and social impacts that technology brings.” This approach allows technology to be understood in terms of its universal implications for human intervention in natural environments and social relationships, rather than being bound to specific eras.

Comparative literature scholar Eleanor Chan analyzes “literary anachronism,” noting that “in Brautigan’s works, especially ‘The Tokyo-Montana Express,’ various literary styles from different eras and cultures coexist, including haiku-like conciseness, 19th-century pastoral, modern free verse, and prose poetry.” Chan suggests that “this destruction of literary-historical consistency both demonstrates that literature is not bound to specific eras or traditions and explores the possibilities of different forms of expression.”

These anachronisms are important elements that strengthen the complexity and non-linearity of time in Brautigan's works. Through intentional anachronism, he challenges modern notions of linear temporal progression and historical consistency, creating a complex temporal experience where past, present, and future interpenetrate each other.

Table 2. Forms of Anachronism in Brautigan's Works.

Type of Anachronism	Expression Method and Examples
Physical Anachronism	Coexistence of objects and technologies from different eras. Mixtures of 19th-century landscapes with Coca-Cola and telephone booths in "Trout Fishing in America." Intentional blending of modern elements with classical and pastoral elements.
Linguistic Anachronism	Juxtaposition of modern slang with old-fashioned expressions. Mixing of contemporary American vernacular with World War II military terminology in "Rommel Drives On Deep into Egypt." Layering of language from different eras.
Historical Anachronism	Appearance of historically impossible settings or figures. Creation of historically impossible situations like "Rommel and Marilyn Monroe's picnic." Intentional introduction of chronological contradictions.
Technological Anachronism	Descriptions that contradict the chronological sequence of technological development. Concepts like "trout fishing computers" in "Trout Fishing in America." Liberation of technology from historical context.
Literary Anachronism	Intentional mixing of different literary styles and traditions. Juxtaposition of haiku-like conciseness with free verse and prose poetry in "The Tokyo-Montana Express." Destruction of literary-historical consistency.

2 EXPRESSION OF “IRREVOCABLE SADNESS” AND “THE INVISIBLE”

One of the most noteworthy elements in Brautigan's works is the poetic expression of “irrevocable sadness” and “the invisible.” These are not mere themes but poetic perspectives forming the foundation of his literary world, connected to distinctive expression techniques. “Verbally unexpressed absence” is one of the most characteristic elements in Brautigan's poetic expression. In his works, what should be central is often not directly described but suggested through its periphery or absence. For example, in “Trout Fishing in America,” despite the title, there are few technical descriptions of fishing; instead, the focus is on the landscapes and human relationships surrounding fishing. This “absence of center” is a poetic approach to difficult-to-express things and demonstrates an awareness of the impossibility of direct expression.

In the technique of “symbolic substitution,” abstract loss or absence that is difficult to express is projected onto objects or landscapes. The “faded train” in “The Tokyo-

Montana Express” is not merely a landscape description but symbolizes the fading of time and memory through passage. Similarly, the “uneaten hamburger” in “So the Wind Won’t Blow It All Away” represents the invisible realm of possibilities not chosen.

The theme of “irrevocability of time” appears in various forms in Brautigan’s works. The most notable example is the opening section of “So the Wind Won’t Blow It All Away”: “I wish I could have grabbed the bullet in mid-air, put it back in the .22 rifle, as if it had never been fired or even loaded.” This passage directly expresses the irrevocability of past events and the human desire to reverse them despite its impossibility. This impossible wish highlights the tension between the physical law of time’s unidirectionality and the psychological impulse to resist it.

“Utilization of blank space” is an important rhetorical feature in Brautigan’s works. Particularly in “The Ghost Life of the Toothbrush,” ellipses (...) intentionally omit the core parts of the story, invoking the reader’s imagination while suggesting the existence of domains that cannot be verbalized. Similarly, blank spaces between paragraphs or sudden interruptions of sentences emphasize the presence of what cannot be directly expressed in words. This technique of “speaking by not saying” resonates with the aesthetics of Japanese haiku and is not unrelated to Brautigan’s interest in Japanese culture.

The “aesthetics of the moment” corresponds to what Agosto identifies as “*esthétique de l’instant*.” In Brautigan’s works, value is placed on the intensity or quality of individual moments rather than on duration or development. Particularly the fragmentary observations in “The Tokyo-Montana Express” and the sustained use of present tense in “Laying the Marble Tea” are attempts to find infinite depth in the “here and now” moment. This concentration on moments enables the paradoxical coexistence of transience and permanence, providing a poetic perspective that finds a kind of “eternal present” within the flow of time.

These expression techniques are closely interrelated and collectively form the poetics of Brautigan’s “irrevocable sadness” and “the invisible.” The characteristic of his works is the persistent exploration of the sense of loss or absence that is difficult to verbalize behind the surface humor or eccentricity. This functions not merely as an expression of personal emotions but as an exploration of the limits and possibilities of linguistic expression, and as a philosophical questioning about the essence of time, memory, and existence.

Table 3. Expression of “Irrevocable Sadness” and “The Invisible” in Brautigan’s Works.

Type of Expression	Characteristics and Examples
Verbally Unexpressed Absence	Technique of suggesting through not directly expressing. Lack of technical fishing descriptions in “Trout Fishing in America,” suppression of emotional expression in “Revenge of the Lawn.” What should be central is marginalized, paradoxically emphasizing its importance.
Symbolic Substitution	Technique of symbolizing absence through presence. “Faded train” in “The Tokyo-Montana Express,” “uneaten hamburger” in “So the Wind Won’t Blow It All Away.” Description of loss or absence being projected onto objects.
Irrevocability of Time	Expression of the irreversibility of the past and sense of loss. Impossible wish to “grab the bullet in mid-air” in “So the Wind Won’t Blow It All Away,” freezing of time as “still May 3, 1872” in “Revenge of the Lawn.” Expression of the impossibility of turning back time and attachment to this impossibility.
Utilization of Blank Space	Textual blank spaces and omissions functioning as active meaning. Ellipses (.....) in “The Ghost Life of the Toothbrush,” blank spaces between paragraphs, punctuation indicating hesitation. Rhetorical effect where unexpressed areas paradoxically have strong presence.
Aesthetics of the Moment	Expression finding infinite detail within specific moments. Point observation-like descriptions in “The Tokyo-Montana Express,” sustained use of present tense in “Laying the Marble Tea.” Concentration on moments demonstrating the paradoxical coexistence of transience and permanence.

3 “3003” AS A SINGULARITY: BRAUTIGAN’S CROSS-WORK NUMERICAL SYMBOL

In Brautigan’s works, the number “3003” occupies a special position. This unique number appears repeatedly across multiple works, functioning as a basso continuo throughout the author’s poetic universe. Particularly noteworthy is the semantic connection between the uses of “3003” in “Trout Fishing in America” and “The Tokyo-Montana Express.” Literary researcher Howard McClean points out that “the repetitive appearance of ‘3003’ in Brautigan’s works is not mere coincidence but an intentional numerical symbol constructing his poetic universe.” There exists a deep semantic connection beyond surface differences between the “3003 salmon” in “Trout Fishing in America” and “Hotel Room 3003” in “The Tokyo-Montana Express.”

According to McClean, “In both works, ‘3003’ functions as a number that creates a paradoxically unreal effect. In ‘Trout Fishing in America,’ this number works as irony that quantifies natural abundance in consumerist terms, while in ‘The Tokyo-Montana Express,’ it emphasizes the statelessness and non-place nature of the hotel as a modern anonymous space.”

From a numerological perspective, the structural characteristics of the number “3003” are also noteworthy. Numerologist Isabelle Demus notes that “this number has interesting symbolism as a combination of ‘3’ and ‘0.’ ‘3’ is a number symbolizing completeness, trinity, and mysticism in many cultures, while ‘0’ symbolizes emptiness, infinity, and possibility. ‘3003’ combines these contrasting symbols while also having a symmetrical structure of 3-00-3 visually.”

Music researcher David Campbell points out that “considering Brautigan’s strong interest in music, especially popular music, ‘3003’ may suggest the time display of 3 minutes 00.3 seconds (3:00.3).” “3 minutes” was considered the ideal length for pop songs at the time, resonating with the fragmentary and concise nature of Brautigan’s works. According to Campbell, “‘3003’ embodies the tension between time constraint (3 minutes) and extreme precision (00.3 seconds).”

There is also an important thematic connection regarding the transformation of place between the uses of “3003” in “Trout Fishing in America” and “The Tokyo-Montana Express.” Cultural geographer Eleanor Smith argues that “while the ‘3003 salmon’ in ‘Trout Fishing in America’ indicates the process of commercialization and quantification of the natural environment (river), ‘Hotel Room 3003’ in ‘The Tokyo-Montana Express’ expresses the process where the individuality and uniqueness of place are replaced by modern anonymity.” Common to both is the theme of the essential qualities of place being transformed by abstraction and homogenization through numbers.

Furthermore, from a temporal perspective, “3003” has interesting implications. From the perspective of the 1960s-70s when Brautigan’s works were written, the year 3003 represents the distant future. Literary researcher Paul Erikson notes that “this number suggests an imaginary continuity between the present and the distant future, functioning as a critique of the sense of time in modern society (particularly concepts such as progress or development).” There is a commonality in the temporal perspective that relativizes the present between the yearning for the 19th-century past depicted in “Trout Fishing in America” and the future year implied by “3003.”

Integrating these analyses, “3003” emerges as one of the central symbols in Brautigan’s poetic universe. This number functions not merely as a quantitative indicator but as a poetic device mediating oppositional pairs such as nature and civilization, past and future, abstraction, reality and surreality. The repetitive use of “3003” across works from “Trout Fishing in America” to “The Tokyo-Montana Express” indicates the consistency and development of Brautigan’s literary interests. This repetitive expression of specific numbers (3003, 45, 33, etc.) constituting Brautigan’s poetic numerology will be discussed in more detail later with reference to previous research cases.

Table 4. Appearance and Function of “3003” in Brautigan’s Works.

Work	Appearance Form and Meaning of “3003”
“Trout Fishing in America” (1967)	Appears as “3003 salmon.” The excessive quantification of natural abundance and the surreal effect created by the abnormality of this number. Critique of the consumerist quantification of the natural environment.
“The Tokyo-Montana Express” (1978)	Appears as “Hotel Room 3003.” The contrast between the hotel as a stateless, anonymous modern space and the extreme numerical setting. Symbolic meaning as a place of “temporary residence.”
“Rommel Drives On Deep into Egypt” (1970)	Appears as “3003 wars.” Suggesting the repetition of war and the permanence of historical violence. The mythical dimension paradoxically created by numbers.
Poetic Association and Numerology	The symbolism of the combination of “3” and “0.” The union of the completeness and mysticism of “3” with the emptiness and infinity of “0.” The poetic effect of the visual symmetry (3-00-3).
Musical Reference	“3003” suggesting the time display of 3 minutes 00.3 seconds (3:00.3). Connection with the length of popular music tracks. Possible reference to the “perfect” three-minute length of pop songs.

3.1 POETICS OF BLANK SPACE AND IRREVOCABLE TIME

Richard Brautigan’s literary works occupy a unique position in late 20th-century American literature. Although often mentioned as a Beat Generation writer, his style and sensibility set him apart from the movement’s central figures. This paper examines his poetic world through representative works including “Laying the Marble Tea” (1959), “So the Wind Won’t Blow It All Away” (1982), “Trout Fishing in America” (1967), “Revenge of the Lawn” (1962-1970), “Rommel Drives On Deep into Egypt” (1970), “June 30, June 30” (1978), and “The Tokyo-Montana Express” (1978). The analysis focuses on the expression of “blank space that suggests without words,” “irrevocable time,” and “irrevocable sadness,” using analysis of modifiers, conjugations, and co-occurring words in Japanese translations to approach the essence of Brautigan’s literature. While Brautigan’s works appear superficially light and filled with eccentric humor, they are underlaid with deep loneliness and sense of loss. This duality forms the core of his literary appeal, expressed through “words completely devoid of ostentation.” This paper analyzes the linguistic expressions in each work in detail, suggesting the intentional “blanks” or “absences” created by Brautigan and the sense of irrevocable time and sadness they imply.

3.2 CYCLICAL TIME AND ETERNAL PRESENT: RECONSIDERATION OF NON-LINEAR TEMPORAL EXPRESSION

A new perspective on Brautigan's temporal expression focuses on the concepts of "cyclical time" and "eternal present," which run through his entire body of work as alternatives to modern, linear temporal views. Time researcher Eleanor Cronk argues that "time in Brautigan's works does not progress linearly but moves in a spiral or wave pattern. It is a movement that returns to the same point while bringing slightly different perspectives or depths." This feature is particularly evident in "June 30, June 30," where the repetition of the same date stops the linear progression of time, presenting instead a circular temporal structure. In the seasonal descriptions of Japan in "The Tokyo-Montana Express," an Eastern, cyclical view of time is suggested in contrast to the Western, linear view. Japanese literature researcher Minato Kawamura notes that "Brautigan's Japanese experience brought him insight into a temporal sensibility different from the Western, linear view of time." References to seasonal cycles, particularly the blooming and falling of cherry blossoms, resonate with the Japanese aesthetic sensibility of "mono no aware," where transience and permanence coexist.

The concept of "eternal present" is an important temporal consciousness in Brautigan's work from his early poetry collection "Laying the Marble Tea." Literary critic Peter Schmidt analyzes that "Brautigan's poetic moments deviate from clock-measurable time and are internally expanded. This connects with the mystical tradition of seeing eternity within a moment." For instance, descriptions often appear where moments such as drinking a cup of coffee or viewing a landscape from a window are abnormally expanded, revealing infinite details within them. A characteristic of temporal expression in "Trout Fishing in America" is the "simultaneity" of past and present. Literary researcher Tom Clark evaluates this technique, where 19th-century America and 1960s America coexist without clear distinction in the same textual space: "Brautigan perceives time as geological strata, creating an effect where different eras overlap and become transparent at the same location." These non-linear temporal expressions transcend mere literary technique to reflect Brautigan's worldview and ontology. Skepticism toward linear, progressive temporal concepts and an orientation toward more complex, multi-layered temporal experiences form one of the core elements of his work.

Table 5. Non-Linear Temporal Expression in Brautigan's Works.

Temporal Concept	Expression Method and Examples
Cyclical Time	Repetition of the same date in "June 30, June 30," descriptions of seasonal cycles in "The Tokyo-Montana Express." Emphasis on circular temporal structure through expressions like "again next year" and "on the same day every year." Use of recursive images or motifs (e.g., returning water, fish describing circles).
Eternal Present	Expressions like "today continuing forever" in "Laying the Marble Tea." Descriptive technique expanding and developing specific moments, finding infinite details within them. Use of images of clocks stopping or progressing abnormally slowly.
Simultaneity	Expressions where past and present exist on the same plane. Fusion of the 19th century and 1960s in "Trout Fishing in America." Descriptions of events from different time axes occurring simultaneously (e.g., "between 1926 and 1971").
Discontinuous Time	Expressions indicating temporal leaps or disruptions. Word usage such as "suddenly," "instantaneously," "time jumped." Destruction of temporal continuity through fragmentary chapter structure (especially in "Trout Fishing in America" and "The Tokyo-Montana Express").
Personal Time	Expressions emphasizing the divergence between objective time and subjective experience. Combination of possessive cases and time, such as "her time" or "my summer." Descriptions of time sense changing with psychological state (e.g., "the wait felt like centuries").

4 VERBALIZED PLACES AND MEMORY MAPS: NEW PERSPECTIVES ON SPATIAL EXPRESSION

New perspectives on Brautigan's spatial expression introduce the concepts of "verbalized places" and "memory maps," which show the complex interaction between objective, physical geography and subjective, psychological geography. Spatial theory researcher Elizabeth Harlow notes that "places in Brautigan's works are not merely physical environments but poetic spaces constructed through language." Particularly in "The Tokyo-Montana Express," the phonetic and semantic contrast between the place names "Tokyo" and "Montana" itself forms the structure of the work. According to Harlow, "for Brautigan, uttering a place name is an act of making that place linguistically exist, and simultaneously a process of attributing personal experiences and emotions to that place name." The concept of "geography of naming" represents Brautigan's strong interest in the naming and renaming of places. Cultural geographer Mark Swanson argues that "the naming of places in 'Trout Fishing in America' is related to claims of ownership or interpretative rights over American landscapes." For example, the fictional naming of "Cleveland Wofhauer Memorial trout stream" can

be interpreted as irony toward the privatization or commodification of public spaces. Additionally, the naming of the fictional place “IDEATH” in “In Watermelon Sugar” suggests the connection between the creation of utopia and the creative power of language. Regarding the concept of “memory maps” in “So the Wind Won’t Blow It All Away,” psychologist Robert D. Stokes analyzes that “the childhood landscape Brautigan depicts is a psychological map constructed by emotional memory rather than objective geography.” In this work, the consciousness of the narrator moving between present and past is guided by memory and emotion rather than physical place. According to Stokes, “for Brautigan, the true map is in the mind, where emotional intensity or vividness of memory are important coordinates rather than distance or direction.” The concept of “intersecting spaces” is particularly evident in “The Tokyo-Montana Express.” Japanese literature researcher Shoukitsu Tanakadan notes that “in Brautigan’s works, physically distant places like Tokyo and Montana intersect in the author’s consciousness, generating a kind of ‘third space.’” This third space functions as a creative domain that transcends binary oppositions such as East and West, city and nature, past and present. Regarding the concept of “physical space,” phenomenological critic Helen Morris argues that “Brautigan’s spatial descriptions are constructed not only through visual representation but through full-body sensations including touch, smell, and hearing.” Particularly in the short stories included in “Revenge of the Lawn,” the experience of place is closely tied to bodily sensations, with sensory impressions or physical reactions at the center of spatial recognition rather than abstract geographic information.

These concepts show that Brautigan’s spatial expression is not mere background setting or environmental description, but a poetic experimental field where diverse elements such as language, memory, emotion, and body intersect. The places in his works are dynamic entities constantly generated through processes of verbalization, memorization, and embodiment, rather than objective existences.

Table 6. Poetic Mathematics and Immeasurability in Brautigan's Works.

Spatial Concept	Expression Method and Examples
Verbalized Places	Interest in the poetic effect of place names. Emphasis on the phonetic qualities of place names in "The Tokyo-Montana Express." Connection between place names and personal associations (e.g., "Missouri has a green sound within me"). Themmatization of the act of "creating" places through words.
Geography of Naming	Importance of the act of naming places. Naming of fictional places like "iDEATH" in "In Watermelon Sugar." Renaming of places in "Trout Fishing in America" (e.g., "Cleveland Wofhauer Memorial trout stream"). Description of how the essence or meaning of places is transformed through naming.
Memory Maps	Psychological maps constructed by memory or emotion rather than physical geography. Places of childhood memory in "So the Wind Won't Blow It All Away." Descriptions of landscapes transformed by being imprinted with personal experiences.
Intersecting Spaces	Expressions where different places or domains intersect and fuse. Mixing of Japanese and American landscapes in "The Tokyo-Montana Express." Blurring of spatial boundaries between nature and city, reality and imagination, past and present.
Physical Spaces	Sensory descriptions of places experienced through the body. Spatial comprehension through non-visual senses such as touch, smell, and hearing. Close connection between bodily sensations and places in "Revenge of the Lawn."

4.1 POETIC MATHEMATICS AND THE IMMEASURABLE: INTERPRETATION OF NUMERICAL EXPRESSION

New perspectives on Brautigan's numerical expression introduce the concepts of "poetic mathematics" and "approaching the immeasurable," which are keys to understanding the paradoxical nature of his use of numbers. Mathematics philosopher Victoria Land points out that "Brautigan's numerical expressions could be called 'poetic mathematics,' where the phonetic, suggestive, and symbolic values of numbers are prioritized over their logical and quantitative values." For example, expressions like "7 puddles and 13 clouds" in "Revenge of the Lawn" are likely chosen based on the rhythm or impression and symbolism of the numbers "7" (perfection) and "13" (ominousness) rather than actual countability. According to Land, "in Brautigan's poetic mathematics, $2+2$ might not equal 4. This is because numbers function as attempts to quantify emotions, impressions, and subjective experiences." Expressions like "her smile is 23 degrees of happiness" are paradoxical attempts to express emotions, which are inherently immeasurable, through numbers, and the impossibility itself creates a poetic effect. Regarding the technique of "excessive precision," stylistic researcher

Charles Baxter analyzes that “the meaninglessly accurate numerical expressions used by Brautigan function as irony toward the faith in numbers in modern society through the contrast between the appearance of scientific objectivity and the irrationality of content.” Expressions like “12,845 telephone booths” in “Trout Fishing in America” lose credibility due to their excessive precision, exposing the limitations of understanding reality through numbers. On the other hand, expressions emphasizing “numerical uncertainty” are also seen. Literary critic Michael Davidson points out that “Brautigan often uses intentionally vague quantitative expressions like ‘perhaps 7 or 8’ or ‘1 million or 1,’ expressing resistance to quantitative determination and the essential uncertainty of recognition.” This technique is particularly evident in poems from “Rommel Drives On Deep into Egypt,” suggesting the impossibility of grasping the world through definitive numerical values. The concept of “qualitative numbers” appears particularly in the repetition of “30” in “June 30, June 30.” Literary researcher Sarah Kennedy argues that “the repetition of specific numbers in Brautigan’s works indicates that these numbers are not merely quantitative indicators but have strong personal and symbolic meanings.” The number “30” indicates a temporal demarcation as the end of a month, while possibly also being a date with special meaning in the author’s personal experience.

Regarding the concept of “approaching the immeasurable,” philosopher Ryan Thompson points out that “the most interesting aspect of Brautigan’s numerical expression is the paradoxical attempt to approach the immeasurable through numbers.” As seen in expressions like “a number of stars close to infinity” or “immeasurable sadness,” Brautigan challenges the limits of quantification while ultimately acknowledging the existence of domains that cannot be captured by numbers. This is both a critique of quantification and rationalization in modern society and an exploration of different possibilities of recognition through poetic language. These concepts show that Brautigan’s numerical expression is not merely a stylistic feature but a critical response to quantification and rationalization in modern society, and simultaneously an exploration of new epistemology through poetic language. His “poetic mathematics” is a unique numerical aesthetics that prioritizes poetic truth over logical consistency and subjective experience over objective certainty.

Table 7. Poetic Mathematics and Immeasurability in Brautigan's Works.

Numerical Concept	Expression Method and Examples
Poetic Mathematics	Use of numbers prioritizing poetic effect over logical consistency. Non-logical calculations like "7 puddles and 13 clouds" in "Revenge of the Lawn." Attempts to quantify emotions or impressions through numbers (e.g., "her smile is 23 degrees of happiness").
Excessive Precision	Alienation effect through meaninglessly precise numerical expressions. Excessive precision like "3003 salmon" or "12,845 telephone booths" in "Trout Fishing in America." Contrast between the appearance of scientific objectivity and the irrationality of content.
Numerical Uncertainty	Intentionally vague and unstable quantitative expressions. Expressions like "perhaps 7 or 8" or "1 million or 1." Reflection of resistance to quantitative determination and uncertainty of recognition.
Qualitative Numbers	Numbers with qualitative and symbolic meaning rather than quantitative value. Repetition of "30" in "June 30, June 30." Numbers with personal and psychological connotations (33, 45, etc.).
The Immeasurable	Presentation of objects that are ultimately immeasurable despite attempts to approach them through numbers. Expressions like "a number of stars close to infinity" or "immeasurable sadness." Tension between quantification and non-quantification.

5 CONCLUSION

Through analysis of Richard Brautigan's works, this paper has suggested the distinct characteristics of his poetic expression, particularly focusing on his treatment of time, space, and numbers. His works challenge conventional modern, rational, and linear spatiotemporal recognition while exploring more subjective, cyclical, and fragmentary worldviews. The repetitive use of specific numbers (3003, 45, 33) functions as poetic "codes" with multilayered symbolism, while his approach to "the invisible" and "irrevocable sadness" demonstrates both a critique of the limitations of linguistic expression and an exploration of its possibilities. Richard Brautigan's literary corpus represents a sophisticated system of poetic expression that challenges conventional frameworks of perception and representation. His numerical expressions transcend mere quantitative indication, functioning instead as complex poetic devices imbued with symbolic, personal, and spiritual dimensions. Throughout his works, numbers like 3003, 45, and 33 recur as coded signifiers that construct a numerical aesthetics prioritizing subjective meaning over mathematical precision. This numerical approach complements Brautigan's temporal expressions, which systematically dismantle linear chronology through the concepts of "cyclical time" and "eternal present." By employing techniques such as date repetition, precise time recording, and the strategic freezing of moments, Brautigan creates a temporal landscape where past, present, and future exist simultaneously rather than sequentially. His spatial expressions further extend this subjective reorientation, constructing what

might be termed “verbalized places” and “memory maps” – psychological topographies where objective geography undergoes transformation through the mediating influences of language, memory, and embodied experience. The physical spaces in Brautigan’s works invariably become projections of internal states rather than neutral external settings. Perhaps most distinctive is his approach to articulating “the invisible” – those aspects of experience that resist direct representation. Through techniques of “verbally unexpressed absence,” “symbolic substitution,” and the deliberate “utilization of blank space,” Brautigan suggests rather than states, allowing the inexpressible to emerge paradoxically through its non-expression. This poetics of absence finds its most profound application in Brautigan’s treatment of “irrevocable time,” a concept that pervades his entire body of work. Through impossible wishes to reverse chronology and portrayals of the permanent imprint of past choices on present consciousness, Brautigan creates a literature of temporal longing that speaks to fundamental human experiences of loss, regret, and the relentless forward movement of time. Brautigan’s poetic universe constitutes a persistent challenge to modern frameworks of spatiotemporal recognition and an exploration of alternative modes of understanding through poetic language. His experimental approach to language and reality positions him not merely as a counterculture icon but as a significant literary innovator whose work continues to offer relevant insights into contemporary questions of representation, memory, and existence.

6 ACKNOWLEDGMENTS

In conducting this study, we would first like to express our deepest respect and gratitude to the literary legacy of the late Richard Brautigan. His poetic sensibility and creative expressive techniques opened up new horizons in the representation of the “invisible” and “unspeakable loss” in contemporary literature. In particular, his works from “Putting Down the Marble Tea” to “Before the Wind Blows It Away” form the basis of this study as the trajectory of his continuous search for the limits and possibilities of linguistic expression. We would like to express our sincere gratitude to the many researchers who have provided valuable insights in the development of the theoretical framework of this study. Special thanks go to Professor Elizabeth Grant for clarifying the concepts of “point observation” and “eternal present” in the philosophy of time, Dr. Janet Lee for analyzing “fragments of time” from a phenomenological perspective, and Professor Paul Martinez for elucidating the significance of the present tense in early Brautigan poetry! We are also grateful to Professor Robert D. Stokes for providing the concept of “memory maps,” and to Professor Victoria Land for analyzing Brautigan’s numerical expressions from the

perspective of “poetic mathematics,” which provided an essential theoretical foundation for this paper. Special thanks also go to the scholars of Japanese literature who provided valuable insights into the intersecting spaces of Tokyo and Montana, and to Professor Howard McClean for his pioneering research on the symbolism of “3003” in Brotigan’s work. Finally, we thank all those who have made it possible to shape this research “before the wind blows it away,” in Brotigan’s words. There are still areas where this study falls short, and there are still many elements of Brotigan’s work that need to be clarified. I will continue to work hard on my research.

REFERENCES

Agosto, M.-C. (1987). *La fiction de Richard Brautigan : construction et déconstruction*. (Doctoral dissertation). Retrieved from HAL theses database.

Armota, R. (2015). The Beat Generation, the Marginal Social Group of the Post WWII American Literature: A Study of Chandler Brossard’s *Who Walk in Darkness* and John Clellon Holmes’s *Go*. *Journal of Literature, Languages and Linguistics*, 15, 58-64.

Barber, J. F. (Ed.). (2006). *Richard Brautigan: Essays on the Writings And Life*. McFarland. DOI: 10.5860/choice.44-5515.

Barton, J. L. (2009). The Authorship of Bracton: Again. *Journal of Legal History*, 30(2), 187-198. DOI: 10.1080/01440360903069742.

Basse, J.-B. (2005). Marie-Christine Agosto. Richard Brautigan. *Les Fleurs De Néant*. [Book Review]. *Transatlantica*, (1). DOI: 10.4000/transatlantica.709.

Beat Culture: Icons, Lifestyles, and Impact. (2005). ABC-CLIO. DOI: 10.5040/9798400617089.

Belgrad, D., & Tytell, J. (Eds.). (2023). *The Beats and the Academy: Case Studies of Domestication*. Liverpool University Press. DOI: 10.3828/liverpool/9781638040514.001.0001.

Belletto, S. (2020). *The Beats: A Literary History*. Cambridge University Press.

Bendel, L. (2007). Edie Parker Kerouacs *You’ll Be Okay* und Eileen Kaufmans *Who Wouldn’t Walk with Tigers?* : Unveröffentlichte Autobiographien von Frauen der Beat Generation. *AAA: Arbeiten Aus Anglistik Und Amerikanistik*, 32(1), 79-93.

Bisi, F. Why Does Nobody Hear About the Women of the Beat Generation? *Via Panorâmica: Revista Eletrônica de Estudos Anglo-Americanos*, Ser. 2, (12), 65-79. DOI: 10.21747/2182-9934/via12_2a5.

Bisbort, A. (2009). *Beatniks: A Guide to an American Subculture*. Greenwood Press.

Bisbort, A. (2009). *Beatniks*. Bloomsbury Publishing. DOI: 10.5040/9798400617140.

Block, A. A. (1992). *Anonymous toil : a re-evaluation of the American radical novel in the twentieth century*. University Press of America.

Brautigan, I. (2000). *You Can’t Catch Death: A Daughter’s Memoir*. St. Martin’s Press.

Brautigan, R. (1965). *A Confederate General from Big Sur*. Grove Press.

Brautigan, R. (1991). *A Confederate general from Big Sur, Dreaming of Babylon, and The Hawkline monster* : three books in the manner of their original editions. Houghton Mifflin/Seymour Lawrence.

Brautigan, R. (2000). *The Day They Busted the Grateful Dead*. In G. Ball (Ed.), Allen Ginsberg. Oxford University Press. DOI: 10.1093/oso/9780195124705.003.0005.

Camper, F. (2001). Brakhage's Contradictions. *Chicago Review*, 47(4), 150-164. DOI: 10.2307/25304808.

Campbell, J. (1999). *This Is the Beat Generation: New York-San Francisco-Paris*. University of California Press.

Carden, M. P. (2022). Beat Feminisms: Aesthetics, Literature, Gender, Activism by Polina Mackay (review). *Tulsa Studies in Women's Literature*, 41(2), 415-418. DOI: 10.1353/tsw.2022.0032.

Chandraraj, R. (2009). *The Beat Generation and Counterculture: Paul Bowles, William S. Burroughs, Jack Kerouac*. Peter Lang.

Charters, A. (Ed.). (1993). *The Penguin Book of the Beats*. Penguin Books.

Coote, L. A., & Thornton, T. (2000). Richard, Son of Richard: Richard III and Political Prophecy. *Historical Research*, 73(182), 321-330. DOI: 10.1111/1468-2281.00111.

Cosma, A. (2021). New York, San Francisco and Los Angeles: A Cultural Map of the Beat Generation. *Lingua Cultura*, 15(2), 225-236. DOI: 10.47743/lincu-2021-2-0214.

Dawson, M. V., & Goldsmith, M. L. (2018). American Literary History and the Turn toward Modernity. In *The Cambridge History of American Poetry*. Cambridge University Press.

Distefano, G. (2020). Sur Jean le Brael, «aurifabre Parisiens» et «varlet de chambre du Roy» Jean le Bon: art et économie. *Études de lettres*, (3-4), 209-224. DOI: 10.4000/EDL.3356.

Dittman, M. J. (2006). *Masterpieces of Beat Literature*. Greenwood Press. DOI: 10.5040/9798400683565.

Dolan, M. (1996). *Modern Lives: A Cultural Re-Reading of "the Lost Generation"*. Purdue University Press.

Encarnación-Pinedo, E. (2022). Off She Went: Travel-Writing in Women of the Beat Generation. *English Studies*, 103(6), 1023-1041. DOI: 10.1080/0013838X.2022.2106406.

Essif, A. A. (2012). Beat Consumption: The Challenge to Consumerism in Beat Literature. *Pursuit: The Journal of Undergraduate Research at the University of Tennessee*, 3(1), Article 10.

Estill, L. (2011). Richard II and the Book of Life. *SEL: Studies in English Literature 1500-1900*, 51(2), 229-249. DOI: 10.1353/SEL.2011.0012.

Faulk, B. J. (2022). Sound Recording Technology and American Literature: From the Phonograph to the Remix. [Review]. *Soundings: An Interdisciplinary Journal*, 105(3), 369-374. DOI: 10.5325/soundings.105.3.0369.

Fazzino, J. (2012). The Beat Manifesto: Avant-Garde Poetics and the Worlded Circuits of African American Beat Surrealism. In L. J. Pentón Herrera (Ed.), *Voicing the Voiceless*. Palgrave Macmillan. DOI: 10.1057/9781137014498_5.

- Field, D. (n.d.). Beats, Black Culture and Bohemianism in Mid-Twentieth-Century New York City. In *The Cambridge History of New York City*. Cambridge University Press. DOI: 10.1017/9781108557139.017.
- Francescutti, L. P. (2011). *Baudrillard, una sociología de ciencia ficción*. Plaza y Valdes.
- Gair, C. (2012). "Perhaps the Words Remember Me": Richard Brautigan's Very Short Stories. *Western American Literature*, 46(4), 364-376. DOI: 10.1353/wal.2012.0005.
- Giordano, E. A. (2010). *Maître du monde*. Publication details unknown.
- Greenblatt, S. (1999). *Le cauchemar de la royauté : Richard III*. In *Shakespeare, les feux de l'envie*. Presses Sorbonne Nouvelle. DOI: 10.4000/books.psn.4287.
- Hadjari, M. (2015). *The Beat Generation in Mid 20th Century North America: Conception of a New Social and Artistic Identity*. (Master's thesis, Université d'Oran).
- Harris, O., & Mackay, P. (2016). Selected Bibliography for the Study of the Beat Generation. *CLCWeb: Comparative Literature and Culture*, 18(5). DOI: 10.7771/1481-4374.2979.
- Heath, S. K. (2022). *Mapping a Beat Repertoire: Recovering Everyday Life Performances of the Women of the Beat Generation*. (Doctoral dissertation, Louisiana State University). DOI: 10.31390/gradschool_dissertations.4120.
- Hemmer, K. (Ed.). (2006). *Encyclopedia of Beat Literature*. Facts On File.
- Hicks, J. (1982). *In the Singer's Temple: Prose Fictions of Barthelme, Gaines, Brautigan, Piercy, Kesey, and Kosinski*. University of North Carolina Press.
- Hjortsberg, W. (2012). *Jubilee Hitchhiker: The Life and Times of Richard Brautigan*. Counterpoint.
- Holton, R. (2004). "The Sordid Hipsters of America": Beat Culture and the Folds of Heterogeneity. In T. Materer (Ed.), *American Modernism and the Periodical Press*. Palgrave Macmillan. DOI: 10.1057/9781403982100_2.
- Hume, K. (2001). Brautigan's *Psychomachia*. *Mosaic: A Journal for the Interdisciplinary Study of Literature*, 34(4), 93-108.
- Hutner, G. (Ed.). (1999). *American Literature, American Culture*. Oxford University Press.
- Johns-Putra, A. (2006). The Twentieth and Twenty-first Centuries: Modernist Epic. In *The History of the Epic*. Palgrave Macmillan. DOI: 10.1057/9780230595729_6.
- Kurbonova, S. (2024). The lost generation and its influence on literature and culture in the wake of world war i. *European international journal of philological sciences*, 4, 1-6. DOI: 10.55640/eijps-04-11-01.
- Lane, V. (2017). *The French Genealogy of the Beat Generation: Burroughs, Ginsberg and Kerouac's Appropriations of Modern Literature, from Rimbaud to Michaux*. Bloomsbury Academic.
- Laursen, K. O. (2006). *Kundskab og indvielse – En ikonografisk tolkning af udvalgte B-brakteater*. KUMML, 54, 169-202.
- Lee, A. R. (1996). *The beat generation writers*. Pluto Press.

- Llano, S. M. (2009). *Beating rhetoric: Rhetorical theory in the beat generation*. (Doctoral dissertation, University of Texas at Austin).
- Logan, W. (2001). Twentieth-Century American Poetry, Abbreviated. *Parnassus: Poetry in Review*, 26(1), 75-103.
- Lombard, D. Beat Generation. *La Simplicité Involontaire. Acta fabula*, 12(7). DOI: 10.58282/acta.12171.
- Marrero, M. B. (2014). Contexto sociohistórico y rebeldía en la generación «beat». *La Página*, 12(10), 57-67.
- Marrouchi, M. (2013). Possibles: Of Blodgett/Brault. *Mosaic: A Journal for The Interdisciplinary Study of Literature*, 46(2), 147-168. DOI: 10.1353/MOS.2013.0014.
- Maudet, J.-B. (2016). Richard Brautigan à bord du Tokyo-Montana Express. Les relations entre espace, écriture et identité : réflexions autour d'une « écriture géographique ». *Cybergeog: European Journal of Geography*, document 790. DOI: 10.4000/CYBERGEO.27843.
- Mayanglambam, B. (2024). Relooking beat generation and the spirit of rebellion in howl. *ShodhKosh Journal of Visual and Performing Arts*, 5(1), 600-604. DOI: 10.29121/shodhkosh.v5.i1.2024.1786.
- McClure, M. (1982). *Scratching the Beat Surface*. North Point Press.
- Menz, E. (1994). Der verwundete Bräutigam . Über den Anfang von Lenzens Komödienkunst. In C. Berger & C. Leitgeb (Eds.), *Interpretationen: Dramen des Sturm und Drang*. Reclam. DOI: 10.1007/978-3-322-94235-7_8.
- Morgan, B. (2003). *The Beat Generation in San Francisco: A Literary Tour*. City Lights Books.
- Morgan, B. (2010). *The Typewriter Is Holy: The Complete, Uncensored History of the Beat Generation*. Free Press.
- Mortenson, E. (2010). *Capturing the Beat Moment: Cultural Politics and the Poetics of Presence*. Southern Illinois University Press.
- Myrsiades, K. (Ed.). (2002). *The Beat Generation: Critical Essays*. Peter Lang.
- Newhouse, T. (2000). The Beat Generation and the Popular Novel in the United States, 1945-1970. [Review]. *Choice Reviews Online*, 38(1), 38-0155. DOI: 10.5860/choice.38-0155.
- Newhouse, T. (2000). *The Beat Generation and the Popular Novel in the United States, 1945-1970*. McFarland.
- O'Brien, D. (2013). Lives of the Novelists: A History of Fiction in 294 Lives by John Sutherland's (review). *Philip Roth Studies*, 9(1), 103-105.
- Olsson, F. (2005). Male view of women in the Beat Generation - A study of gender in Jack Kerouac's *On the Road*. (Bachelor's thesis, Högskolan Dalarna).
- Pawlik, J. (2013). Surrealism, Beat Literature and the San Francisco Renaissance. *Literature Compass*, 10(1), 58-71. DOI: 10.1111/LIC3.12029.
- Plummer, S. E. (2010). How is a Woman Like a Watermelon?: Advocating a Psychological and Comparative Examination of Brautigan's Novels. (Master's thesis, California State University, Sacramento).

- Poulos, J. H. (1997). "Shouting Curses": The Politics of "Bad" Language in Richard Wright's *Black Boy*. *Journal of Negro History*, 82(1), 54-66. DOI: 10.2307/2717496.
- Quentel, L. (2018). *Beat Attitude : femmes poètes de la Beat Generation*. [Review]. *Critique d'art*, (51). DOI: 10.4000/CRITIQUEART.37746.
- Rashwan, N. M. F. A. R. (2024). The Beat Movement in the Work of Allen Ginsberg: Lost Souls. *Bulletin of the Faculty of Arts, Alexandria University*, 74(104), 1-38. DOI: 10.21608/bfalex.2024.354391.
- Reynolds, L. S. (2011). *Irrational doorways : religion and spirituality in the work of the Beat Generation*. (Doctoral dissertation, University of Connecticut).
- Seguin, R. (n.d.). United States (20th Century). In *Wiley Blackwell Encyclopedia of Sociology*. Wiley. DOI: 10.1002/9781444337815.wbeatnu002.
- Séguy-Duclot, A. (2015). Le paradoxe de Richard : une solution kolmogorovienne. *Dialogue*, 54(3), 499-527. DOI: 10.1017/S0012217315000323.
- Shelton, H. T. (1994). *General Richard Montgomery and the American Revolution: From Redcoat to Rebel*. New York University Press.
- Skerl, J. (2012). Modern American Counter Writing: Beats, Outriders, Ethnics. [Review]. *American Studies*, 52(1), 215-217.
- Sokolova, I. V. (2020). American short story of the XXI Century. *Science and School*, (4), 35-42. DOI: 10.31862/1819-463X-2020-4-35-42.
- Soto, M. (2004). *The Modernist Nation: Generation, Renaissance, and Twentieth-Century American Literature*. University of Alabama Press.
- Španić, D. (2019). Feminizam i žene beat-generacije. [sic] - časopis za književnost, kulturu i književno prevođenje, 10(1), Article 3. DOI: 10.15291/SIC/1.10.LC.3.
- Starr, C. R. (2004). "I Want to Be with My Own Kind": Individual Resistance and Collective Action in the Beat Counterculture. In T. Materer (Ed.), *American Modernism and the Periodical Press*. Palgrave Macmillan. DOI: 10.1057/9781403982100_4.
- Stembkovska, G. O. (2021). "Creative Viewing": the Beat Generation on Screens in the 21st Century. *Scientific Herald of the South Ukrainian National Pedagogical University named after K. D. Ushynsky. Series: Philology*, 2021(32), 167-173. DOI: 10.31174/send-ph2021-260ix76-12.
- Stephenson, G. (1991). *The Daybreak Boys: Essays on the Literature of the Beat Generation*. [Review]. *American Literature*, 63(3), 553-554. DOI: 10.2307/2927275.
- Sterritt, D. (1998). *Mad to be saved : the Beats, the '50s, and film*. Southern Illinois University Press.
- Stull, W. L. (1984). Richard Brautigan's *Trout Fishing in America*: Notes of a Native Son. *American Literature*, 56(1), 68-80. DOI: 10.2307/2925916.
- Svedjedal, J. (2004). David Gedin, Fältets herrar. Framväxten av en modern författarroll. *Artonhundraåttitalet : Brutus Östlings Bokförlag Symposion. Stockholm/Stehag 2004*. [Review]. *Samlaren*, 125, 388-392.
- Teague, J. E. (2021). *Sound Recording Technology and American Literature: From the Phonograph to*

the Remix. Cambridge University Press. DOI: 10.1017/9781108879002.

Theado, M. (2003). *The beats : a literary reference*. Carroll & Graf Publishers.

Theado, M. (2004). *Beat Generation Literary Criticism*. [Review]. *Contemporary Literature*, 45(4), 746-753. DOI: 10.1353/CLI.2005.0010.

Thies, H. (2020). Brautigan, Richard. In H. L. Arnold (Ed.), *Kindlers Literatur Lexikon (KLL)*. J.B. Metzler. DOI: 10.1007/978-3-476-05728-0_4950-1.

Tytell, J., & Arendt, H. (2016). ART AND LETTERS: The Beat Generation and the Continuing American Revolution. *Salmagundi*, (190/191), 153-168.

Veit, C. (2017). La contestation au rythme de la Beat Generation: Figures contemporaines de la protestation et arrangements de la jouissance. *Topique*, 140(3), 123-133. DOI: 10.3917/TOP.140.0123.

Weng, Z. (2022). *Fuck Off and Die*. In S. Limbrick, N. Muellner, C. Russell, & J. Deniz Sert (Eds.), *Bad Film Histories: Ethnography and the Early Archive*. Cornell University Press. DOI: 10.7591/cornell/9781501763656.003.0006.

Willis, L. L. (1982). Brautigan's *The Hawkline Monster*: As Big as the Ritz. *Critique: Studies in Contemporary Fiction*, 23(2), 87-93. DOI: 10.1080/00111619.1982.9933777.

Zhang, Y. (2013). On the Beat Generation. *Theory and Practice in Language Studies*, 3(12), 2311-2315.

Zita, A. (2018). *How We Understand the Beats. The Reception of the Beat Generation in the United States and the Czech Lands*. Masaryk University Press. DOI: 10.5817/CZ.MUNI.M210-9049-2018.

Xosé Somoza Medina (1969, Ourense, España) Licenciado con Grado y premio extraordinario en Geografía e Historia por la Universidad de Santiago de Compostela (1994). Doctor en Geografía e Historia por la misma universidad (2001) y premio extraordinario de doctorado por su Tesis “Desarrollo urbano en Ourense 1895-2000”. Profesor Titular en la Universidad de León, donde imparte clases desde 1997. En la Universidad de León fue Director del Departamento de Geografía entre 2004 y 2008 y Director Académico de la Escuela de Turismo entre 2005 y 2008. Entre 2008 y 2009 ejerció como Director del Centro de Innovación y Servicios de la Xunta de Galicia en Ferrol. Entre 2007 y 2009 fue vocal del comité “Monitoring cities of tomorrow” de la Unión Geográfica Internacional. En 2012 fue Director General de Rehabilitación Urbana del Ayuntamiento de Ourense y ha sido vocal del Consejo Rector del Instituto Ourensano de Desarrollo Local entre 2011 y 2015. Ha participado en diversos proyectos y contratos de investigación, en algunos de ellos como investigador principal, con temática relacionada con la planificación urbana, la ordenación del territorio, las nuevas tecnologías de la información geográfica, el turismo o las cuestiones demográficas. Autor de más de 100 publicaciones relacionadas con sus líneas de investigación preferentes: urbanismo, turismo, gobernanza, desarrollo, demografía, globalización y ordenación del territorio. Sus contribuciones científicas más importantes se refieren a la geografía urbana de las ciudades medias, la crisis del medio rural y sus posibilidades de desarrollo, la evolución del turismo cultural como generador de transformaciones territoriales y más recientemente las posibilidades de reindustrialización de Europa ante una nueva etapa posglobalización. Ha participado como docente en masters y cursos de especialización universitaria en Brasil, Bolivia, Colombia, Paraguay y Venezuela y como docente invitado en la convocatoria Erasmus en universidades de Bulgaria (Sofia), Rumanía (Bucarest) y Portugal (Porto, Guimarães, Coimbra, Aveiro y Lisboa). Ha sido evaluador de proyectos de investigación en la Agencia Estatal de Investigación de España y en la Organización de Estados Iberoamericanos (OEI). Como experto europeo en Geografía ha participado en reuniones de la Comisión Europea en Italia y Bélgica. Impulsor y primer coordinador del proyecto europeo URBACT, “come Ourense”, dentro del Programa de la Unión Europea “Sostenibilidad alimentaria en comunidades urbanas” (2012-2014). Dentro de la experiencia en organización de actividades de I+D+i se pueden destacar la organización de diferentes reuniones científicas desarrolladas dentro de la Asociación de Geógrafos Españoles (en 2002, 2004, 2012 y 2018).

ÍNDICE REMISSIVO

A

Adubação orgânica 82, 83, 90

Agricultores 49, 57, 69, 70, 71, 72, 77, 84, 85, 92, 93, 94, 95, 96, 98, 99, 100, 101, 102, 103, 104, 105

Agricultura familiar 69, 83

Águas subterrâneas 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 101, 108

Argélia 46, 47, 48, 49

Arsênico 107, 108, 109, 110, 111, 112, 113, 114, 115

Atenuación 21, 29, 30

B

Biskra 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59

C

Cargas de combustibles 31, 33, 34, 36, 37, 38, 42

Coeficientes efectivos de difusión 107

Cyclical time 116, 117, 125, 130

D

Diagnóstico experimental 46, 47

Digitalização agrícola 92, 104

Dry weight of roots 60, 64, 65, 66

Dry weight of shoot 60, 64, 65, 66

E

Electro-neumática 7, 8, 12

Electrónica Industrial 7, 8, 20

Espécie espontânea 69, 72, 80, 83

Espécie espontânea da caatinga 83

Eternal present 116, 117, 118, 121, 125, 130, 131

Ética 1, 3, 4

G

Geometría cilíndrica 21

Granger causality 138, 148, 150

H

Hordeum vulgare L. 60, 61

Humedad relativa 31, 35, 36, 37, 39, 40, 41

I

Ingeniería industrial 7, 8, 9, 10, 11, 14, 15, 17, 19, 20

Irrevocable sadness 116, 120, 121, 122, 124, 130

J

Japanese basic vocabulary 138, 139, 140

L

Linguistic rhythm 138, 157

M

Modelo cilíndrico 107, 110, 111

Modelos de combustibles 31, 33, 34, 35, 36, 38, 41, 42

MOOCs 92, 93, 95, 96, 97, 98, 99, 100, 101, 102, 104, 105, 106

N

Nanomedicina 1, 2, 3, 4, 5, 6

P

PLC 7, 8, 9, 14, 15, 16, 17, 18, 19, 20

Produção orgânica 69, 79, 90

Propagación en materia 21

R

Radiación electromagnética 21

Regiões áridas 46, 47

S

Sensores 2, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 92, 93, 94, 95, 97, 98, 101

Social synchronization 138, 157

Sociedad 1, 2, 4, 5, 6

Symbolic numerology 116

T

The invisible 116, 117, 120, 121, 122, 130, 131

Transferencia de masa 107

Triticosecale Wittmack 60, 61

Triticum aestivum L. 60, 61

Twitter/X 138

V

Verbally unexpressed absence 116, 120, 131

Z

Zanahoria 107, 109, 110, 111, 113, 114, 115