Journal of Humanistic Mathematics

Volume 3 | Issue 1 January 2013

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Recommended Citation
Skrivanos, C. and Zhang, Q. "Humanistic Mathematics Network Newsletter: A Bibliographic Report," *Journal of Humanistic Mathematics*, Volume 3 Issue 1 (January 2013), pages 33-61. DOI: 10.5642/jhummath.201301.05 . Available at: https://scholarship.claremont.edu/jhm/vol3/iss1/5

Humanistic Mathematics Network Newsletter: A Bibliographic Report

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Synopsis

The *Humanistic Mathematics Network Newsletter* (HMNN) was founded by Alvin White in the summer of 1987 to address a difficult question about mathematics instruction: How can we teach mathematics humanistically? The *Newsletter* had six issues, before it was renamed *The Humanistic Mathematics Network Journal* (HMNJ). In this report, we provide an introduction to and brief comments on each of the articles that appeared in the six issues of *HMNN*. We hope that this report will serve as a guide that can help readers preview the variety of articles published in *HMNN* and choose the ones they would like to read.[1]

The *Humanistic Mathematics Network Newsletter* (HMNN) was founded in the summer of 1987 by Alvin White, a mathematician from Harvey Mudd College, to address a difficult question: How can we teach mathematics humanistically? The *Newsletter* had six issues, before it was renamed *The Humanistic Mathematics Network Journal* (HMNJ). *HMNJ* flourished as well as the *Humanistic Mathematics Network*, the loosely connected people of mathematics who were inspired by the notion of *humanistic mathematics*.

[1]**Editor's note:** Issues of the *HMNN* are currently not available online, but Scholarship@Claremont, the platform on which the *Journal of Humanistic Mathematics* is hosted, is in ongoing negotiations with the individual contributors to get this content online in the near future.

As White himself pointed out (for instance in [12]), this term was not ever formally defined, though several attempts were made. Nonetheless, *HMNJ* reached over three thousand subscribers around the world; by the time its twenty-seventh and final issue came out in 2004, it had touched many souls.

In this report, we provide a brief introduction to each of the articles that appeared in the six issues of *HMNN*. Quotes appearing in an entry are taken directly from the corresponding article. Abstracts and introductions, written by the original authors and published in the original issues, if available, are included in the "Abstract" sections. We have also added brief personal thoughts on most of the articles, so that readers can obtain firsthand reviews and recommendations from us.

We found the experience of working through these issues inspiring. We hope that readers will note our enthusiasm and forgive us for any errors that might have appeared.[2] At the very least, we hope that this report will serve as a guide to *HMNN* and encourage new readers to explore it.

Contents

[2]For instance, when writing the introduction to each journal article, we have borrowed language from the specific articles described. We tried to be explicit when we did so; however, there may be instances where we did not manage to do this as well as we perhaps should have. We apologize in advance for any possible resulting errors on our behalf. Please contact us so that we can rectify any mistakes.

1. Recalling the Humanistic Mathematics Network Newsletter

On March 21–23, 1986, a three-day *Conference to Examine Mathematics as a Humanistic Discipline* held in Claremont, CA, brought together a handful of people who shared some similar concerns about the way mathematics was taught.[3] Discussions continued at a paper session at the 1987 Joint Mathematics Meetings in San Antonio, and there seemed to be enough of a momentum to start a collective that shared concerns but also innovative ideas and possible solutions.

The focus of this new collective, to be called the *Humanistic Mathematics Network*, was two-fold: 1) teaching mathematics humanistically, and 2) teaching humanistic mathematics. These phrases need explanation. So we look at Alvin White's own words from the editorial in *Newsletter*, Issue 1:

[3]The thirty-one participants, with their institutional affiliations at the time, were, in alphabetical order of last names: Frank Andrews (Chemistry, University of California, Santa Cruz), Mort Beckner (Philosophy, Pomona College), Martin Bonsangue (High school teacher, Fullerton, CA), Gary Brown (Math, College of St. Benedict), Steve Brown (Math-philosophy, SUNY Buffalo), Donald Bushaw (Math, Washington State University), Bob Connolly (Math, Webb Prep School), Roger Cooke (Math, University of Vermont), Larry Copes (Math, Augsburg College), Philip Davis (Math, Brown University), Ed Dubinsky (Math, Clarkson University), Harriet Edwards (Math, California State University, Fullerton), Reuben Hersh (Math, University of New Mexico), Jim Jordan (Math, Washington State University), Jeremy Kilpatrick (Math, University of Georgia), Larry Knop (Math, Hamilton College), Mario Martelli (Math, Claremont Graduate School), Jane Martin (Philosophy, University of Massachusetts, Boston), David Meredith (Math, San Francisco State University), Robert Osserman (Math, Stanford University), John Sarli (Math, San Bernardino State University), Fred Shair (Chemistry, CalTech), Don Small (Math, Colby College), Sherman Stein (Math, University of California, Davis), Tom Tymoczko (Philosophy, Smith College), Marion Walter (Math, University of Oregon), Steve Weinstein (Math, California Polytechnic State University, San Luis Obispo), Alvin White (Math, Harvey Mudd College) Paul Yale (Math, Pomona College), Andrew Zanella (Chemistry, Pitzer College) [13].

> The first theme [of teaching mathematics humanistically seeks] to place the student more centrally in the position of inquirer than is generally the case, while at the same time acknowledging the emotional climate of the activity of learning mathematics. What students could learn from each other and how they might come to better understand mathematics as a meaningful rather than arbitrary discipline [are] among the ideas of the first theme.
>
> The second theme [of teaching humanistic mathematics focuses] less upon the nature of the teaching and learning environment and more upon the need to reconstruct the curriculum and the discipline of mathematics itself. The reconstruction would relate mathematical discoveries to personal courage, discovery to verification, mathematics to science, truth to utility, and in general, mathematics to the culture within which it is embedded [8].

Hence it came about that White wrote on August 3, 1987:

> The newsletter will help create a network of mathematicians and others who are interested in sharing their ideas and experiences related to the conference themes. The network will be a community of support extending over many campuses that will end the isolation that individuals may feel. There are lots of good ideas, lots of experimentation, and lots of frustration because of isolation and lack of support. In addition to informally sharing bibliographic references, syllabi, accounts of successes and failures ... the network might formally support writing, team-teaching, exchanges, conferences ... Please send references, half-baked ideas, proposals, suggestions, and whatever you think appropriate ... [8]

Thus began an adventure spanning over fifteen years, what turned out for White to be an intense labor of love. For more on White and White's thoughts about humanistic mathematics, see [6]. For reminiscences about White and some thoughts about his contributions to the world of humanistic mathematics, see [5].

In Sections 2–7 we focus on each individual issue and meticulously describe each and every entry found therein. In Section 8, we briefly recount the story of the successor journal, the *Humanistic Mathematics Network Journal*. Section 9 brings us to today, and aims to contextualize the contributions of *HMNN*.

2. Newsletter Number 1 (Summer 1987)

2.1. Overview and the editorial

The first issue of the *Newsletter*, when you hold it in your hands, might remind you of a school report, typed neatly and with a clean cover page, all stapled together in the top left corner. There is no uniform numbering of the pages, individual pieces have individual page numbering, but one can count that there are a total of thirty sheets of paper that come together to compose the issue. This makes sense when we consider that this issue consists of four of the papers presented at one of the two conferences mentioned earlier in Section 1.

We have already quoted substantially from the (two-page) editorial in the previous section. Therefore we will choose to mainly focus on its aftermath here. The editorial letter from this issue has appeared in every single issue of the *Newsletter*, and thereafter, in several of the *Journal* issues. In some sense, therefore, it might be viewed as an early manifesto of the *Humanistic Mathematics Network*, or at least a historical artifact that shows how far its foundational ideas have evolved.

2.2. Applied Mathematics as Social Contract *by Philip J. Davis*

Abstract. The author takes the position that mathematical education must redefine its goals so as to create a citizenry with sufficient knowledge to provide social back pressure on future mathematizations. This can be accomplished by increasing the part of mathematical education that is devoted to the description and interpretation of the processes of mathematization and by allowing the technicalities of the formal operations within mathematics itself to be deemphasized or automated out by computer.

Highly thoughtful and philosophical, this article would be of interest to many concerned with the true nature of mathematics and how this can influence how we as a society relate to mathematics.

2.3. Gresham's Law: Algorithm Drives Out Thought *by Sherman K. Stein*

The mathematics curricula from middle school and high school to college enforce what Stein describes as "Gresham's law in mathematical pedagogy":

"Cultivation of algorithms replaces concern for thinking and writing." Then he proposes several pedagogical methods that teachers and professors can use to encourage students to think about why they are doing what they are doing in mathematics. Stein summarizes that "the simplest way to resist the assault of Gresham's law is to include exercises that are not simply routine."

This essay is straightforward, and its points are crystal clear; it could be interesting for math teachers who would like to get an outside opinion about how math should be taught.

2.4. Teaching with a Humanist *by David Meredith*

Meredith co-taught a course entitled "The Newtonian Revolution" with several English professors, whom he calls "humanists." This article is about his reflections on how mathematicians and humanists teach the same courses in different ways. He comments that "[g]ood writing, class discussion, and term projects can be adopted to mathematics classes. If mathematics is to become more humanistic, it will have to borrow from the humanities."

Nowadays, Meredith's teaching philosophy is more mainstream, and in particular well-reflected in courses that teach proofs, where students are expected to be concise and complete with their arguments. For instance, in real analysis, students are often instructed to add punctuations after equations to make the sentences complete.

2.5. Patterns of Emotion within Mathematics Problem-Solving *by Frances A. Rosamond*

Rosamond discusses a series of experiments that aim to identify "the optimum conditions that encourage problem-solving." A group in a single experiment consists of two people, one responsible for describing emotions when solving problems, the other responsible for recording those sentiments. As the author puts it, this article "specifically calls the classroom teacher's attention to the nature of the problems, the perceived usefulness of mathematics, the role of observer, the use of mathematics rituals and the testing situation." This paper links mathematics with psychology, and offers a psychological perspective in effective pedagogical methods.

Think-alouds in mathematics education have recently begun once again to attract the attention of researchers and instructors alike. Also, today's research suggests that student emotions do have a substantive impact on their learning. Reading this essay might provide some historical perspective.

3. Newsletter Number 2 (March 1988)

3.1. Overview and the editorial

In this issue, too, we continue with the outward look of a school report or newsletter, but contents have both multiplied and diversified; there are now poems and bibliographies, as well as several new essays on an eclectic collection of themes. A reprint of the editorial from *Newsletter* #1 is followed by a single-page letter from White which describes encouraging developments. Several upcoming conferences and other possible venues of collaboration for the *Network* are listed, and White summarizes all with an optimistic note:

> Mathematicians seem to have an intuitive sense of the naturalness of the Network and begin to create for themselves and their colleagues a sharper definition or a set of examples and illustrations of humanistic aspects of mathematics [9].

3.2. Please Carry Your Coals to Where They Are Needed, Professor Stein *by Melvin Henriksen*

In response to Stein's article (see Newsletter Issue 1 §§2.3), Henriksen writes that if we wish to counter Gresham's law in college mathematics education, "[t]he impetus will have to come from the top; unless college administrators prove by their actions that they want mathematics courses for the bulk of the students to be more than a series of memorized rules."

The fact that mathematics professors often do not have the freedom to alter their curricula for engineering and other students who use mathematics is due to the different opinions and expectations held by different academic departments. College administrators can work with faculty members of the engineering, math, and other departments to find a feasible solution that will not result in the elimination of math requirements in other quantitative disciplines.

3.3. I'll Carry My Coals Where They're Needed, Professor Henriksen *by Sherman K. Stein*

Stein writes a quick defense of his original article "Gresham's Law: Algorithm Drives Out Thought" (§§2.3), in which he acknowledges the difficulties mentioned in Henriksen's article but argues that professors still have some

power in designing their own courses to teach students to think about mathematics.

This is a succinct yet constructive defense for the author's own argument. It shows Stein's good intention: to use his own power to the maximum extent possible to teach mathematics in the way he thinks it should be taught.

3.4. Foundational Studies and Mathematics Teaching *by Allan Muir*

Muir writes that "critical evaluation . . . is . . . almost totally absent from the concept of mathematics held by the majority both of its creators and its users," and the six myths of mathematics, "the myth of individualism, the myth of elitism, the racial myth, the sexist myth, the mechanistic myth, and the absolutist myth, . . . need to be countered by new paradigms of mathematics which emphasize its human-ness, its normality, its rootedness in real, social practice."

3.5. Mathematics and Philosophy *by D. Bushaw*

Bushaw's article looks at many surprising similarities between mathematics and philosophy, a technical discipline and a humanistic discipline. Bushaw holds that either mathematics or philosophy "can be described as an aggregate of systems of abstract ideas that are often very attractive in themselves, but also can provide wonderful frameworks within which to organize and analyze other aspects of human experience."

3.6. Excerpts from and Inserts into My January 23 Talk at the *Mathematics as a Humanistic Discipline* Session *by Anneli Lax*

Lax expresses her opinions about mathematics education and the theme of the conference "Mathematics as a Humanistic Discipline." Lax's arguments are sound and convincing. We especially underline her remarks: "I think an important third aspect [that makes mathematics fascinating] is being neglected, namely the feeling of mental power, or at least mental fitness (a term coined by JoAnne Growney) on the part of those who use mathematical reasoning when appropriate." This essay would be appealing to instructors willing to add humanistic consideration into mathematics teaching.

3.7. The Basis for the Success of the Potsdam Program *by Rick Luttmann*

This article lists Luttmann's seven observations about mathematics education at Potsdam College that he regards as "the basis for the success." This short piece would be of interest to anyone who would like to learn from the success of another mathematics department.

3.8. Two Poems *by Miroslav Holub*

Abstract. Two poems by a modern scientist-poet exemplify a play of wit and insight not easily held within disciplinary bounds.

The first poem *Brief Thoughts on the Theory of Relativity* is a conversation between Albert Einstein and Paul Valéry; the second poem *Brief Thoughts on Exactness* gives real-life examples that illustrate exactness.

3.9. Students Become Data, Statistics Comes Alive *by Linc. Fisch*

This article, written by a math teacher, discusses an experiment that is used to teach students the statistics concept "correlation." The teacher finds that the experimenting process has provoked students' interest in learning statistics.

3.10. A Reply to the Question "Why Math?" *by Louis A. Talman*

In this essay, the author rebuts an answer to "Why Math?" by one of the "specialists" in mathematics. The author provides the readers with his own answer to "why math," which, more specifically, should be stated as "Why should students who are going to be neither mathematicians, scientists, nor engineers study some topics in precalculus mathematics?"

3.11. Readings in Mathematics Education *by Harriet Edwards*

This is a list of readings suggested by the author. The readings are categorized as follows: "General References," "Mathematics Education," "Educational Research and Teaching Techniques," and "Journals."

This bibliography is quite extensive and it can potentially serve as a good (albeit slightly dated) reference list for mathematics instructors who would like to learn about some of the developments in mathematics education.

3.12. A Bibliography in Mathematics Education *by Robert B. Davis*

This is another bibliography in mathematics education divided into three categories: "Cognitive Science Studies of Mathematical Thought," "Educational Use of Computers," and "School Mathematics Curriculum."

4. Newsletter Number 3 (December 1988)

4.1. Overview and the editorial

The last *Newsletter* with the school report look, this issue begins with a two-page letter from the editor updating his readers on several new events coming up and inquiring about possible paths of future action that might help continue the momentum of the *Network*. Next comes a reprint of the editorial from the first issue, followed by a long list of names and addresses, seven pages each, that makes up the membership of the *Humanistic Mathematics Network*. We see already that the *Newsletter* has been reaching across the national borders; there are several international members on the list, from Brazil, Canada, South Africa, Trinidad, and United Kingdom.

In this issue there are once again several papers on a widely ranging selection of topics. Two of the papers are published along with the cover letters; presumably White thought that the letters added to the conversation, or at least introduced the paper or the author. Thus we have a cover letter accompanying Briginshaw's report (§§4.8) and another letter preceding Rosinger's essay (§§4.10).[4] Perhaps analogously, the piece by Wales (§§4.9) is preceded by a brief half-page list of *Goals for Mathematics Education*, almost a manifesto, which introduces the following discussion of mathematics education focusing on applications.

4.2. A Humanistic Academic Environment for Learning Undergraduate Mathematics *by Clarence F. Stephens*

Stephens analyzes why teaching undergraduate mathematics well is extremely difficult under the current university system, and what Potsdam College / SUNY Potsdam did to create "a humanistic academic environment" for undergraduates taking calculus and higher mathematics courses.

[4]Note, again, how far the *Newsletter* has already traveled only about a year after its launch; Briginshaw is writing from Britain, while Rosinger is situated in South Africa.

In the end, he suggests that "similar environments can be established in many colleges and universities." The author provides us with much insight in this essay. Highly recommended for math educators and teachers alike.

4.3. Increasing Learning by Decreasing Math Anxiety *by Gregg Turner*

Turner talks about his own experience in dealing with students' fear of pre-calculus and calculus. He offers many suggestions about how to help students conquer those fears.

4.4. An Innovative Curriculum Idea of the First Two Years of College Mathematics *by Larry Copes*

Copes thinks that students who major in mathematics do not have the mathematical maturity required for advanced work. In response, his college, Augsburg College, presents a list of four goals for its math students: "The student should be able to learn mathematics independently, do mathematics, communicate mathematically, ... [and] understand the importance of mathematics." He then discusses these four goals in detail.

4.5. Untitled *by Chris Jewell*

In this untitled two-page letter, a student of Harvey Mudd College at the end of his first year of studies shares with the readers his feelings about learning new and abstract material.

4.6. For Whom Nobel Tolls *by William Dunham*

This poem ponders why mathematics is excluded from the Nobel Prizes.

4.7. Mathematical Metaphors from Advanced Placement Students *by Dorothy Buerk*

In this report, Buerk presents the results of her experiment in Advanced Placement (AP) classes. Her requirements for the students were: "to list words they would use to describe math, to imagine themselves in a situation of doing math and to list all their feelings while doing math, to list all of the objects (nouns, things) that math is like for them, and finally to read over their three lists and write a paragraph beginning, 'For me math is like a . . . '"

4.8. Report on Mathematics Education *by Anthony Briginshaw*

Abstract. This report is an essay on current perspectives in mathematics education. It is largely concerned with undergraduate mathematics education, and focuses particularly on how mathematics is taught to first and second year engineering undergraduates. It is clear that, as always, such a narrow focus cannot fail to have ramifications in neighbouring areas, and I shall at least mention the following:

1. the history and philosophy of mathematics,
2. the treatment of mathematics in schools,
3. the great success of mathematics as the servant of physics and engineering,
4. misconceptions of what mathematics is and what it seeks to achieve,
5. behavioural phenomena in the lecture meeting, and
6. methods of assessment of lecturer performance.

4.9. Mathematics and Its Application *by Jack V. Wales, Jr.*

Wales believes that "it would be better to teach that mathematics is the study of an independent, extant reality; and that any application of mathematics is the postulating of an analogy between a set of worldly circumstances and a set of mathematical circumstances." The usefulness of mathematics is only one of its many valuable characteristics.

4.10. Transparadigm Mathematics Research Initiative *by Elémer E. Rosinger*

Rosinger first discusses the concept of "science management," then points out that "scientists ... who have worked for long in a given field and can impose their point of view - will get into certain habits of thinking which will inevitably and strongly precondition their way of facing the unknown." To combat this major obstacle toward continued creativity in mathematics research, he proposes to create a network that will allow mathematicians to share "transparadigm research ideas."

5. Newsletter #4 (December 1989)

5.1. Overview and the editorial

The fourth issue of the *Newsletter* is actually printed, as opposed to simply xeroxed and stapled together. It comes with a light blue cover page, with impressive (black-and-white) cover art: *The Ancient of Days Striking the First Circle of the Earth* by William Blake.[5] This is accompanied by seven lines from Milton's *Paradise Lost* [7, **VII**, 225–231]:

> He took the golden Compasses, prepared
> In God's Eternal store, to circumscribe
> This Universe, and all created things.
> One foot he centered, and the other turned
> Round through the vast profundity obscure,
> And said, "Thus far extend, thus far thy bounds;
> This be thy just circumference, O World."[6]

Also printed on the front cover is the newly assigned ISSN: 1047-627X.

Newsletter #4 spans forty-two pages, not counting the reprint of the editorial from *Newsletter* #1. Consistent and continued pagination and typesetting, as well as a footmark ("HMN Newsletter #4") are used throughout. White reports in his editorial that the *Network* at the time consisted of over five hundred members, and that the Exxon Education Foundation, which had financially supported the original conference of 1986 as well as the first issues of *HMNN*, had awarded the *Network* with additional funding that would help with desktop publishing and conference organization.

5.2. Hasseler Whitney 1907–1989: Some Recollections, 1979–1989 *by Anneli Lax*

Lax recalls her encounters with Hasseler Whitney, the well-known topologist who devoted his full attention to elementary mathematics education in his later career, as well as his opinions and philosophies in mathematics education. This is a well-written essay in a gentle and moving tone.

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[5] A full color version was used in the front cover of the *Humanistic Mathematics Network Journal* Issue #26. A reference to *Newsletter* #4 was included therein, as "the first printed issue of this publication."

[6] Punctuation is as in the cover of *Newsletter* #4 and may not agree with other versions.

5.3. The Visits of Hassler Whitney to Brazil: Hassler Whitney, In Memoriam *by Ubiratan D'Ambrosio*

D'Ambrosio recounts short anecdotes that illustrate Hassler Whitney's attention and dedication to mathematics education in Brazil.

5.4. Education for the Students' Future *by Hassler Whitney*

Whitney believes that the various standards set for schools to produce students achieving high scores cause "anxiety and desperation on the part of the students," which in turn "increase dropping out, delinquency, drugs, crime and suicide." Whitney supports what he calls a "basic goal for education." Whitney makes some constructive suggestions about how to achieve this goal.

5.5. PDP/Academic Excellence Workshops in Mathematics *by M. Catherine (Kay) Hudspeth*

Hudspeth first discusses the importance of mathematics education for ethnic minorities, then she describes the calculus workshops held at California State Polytechnic University Pomona that encourage ethnic minorities to explore mathematics in group settings. These workshops have proven to be highly successful in boosting student performance and cultivating critical thinking in mathematics. Hudspeth's essay is inspiring and offers a clear-cut analysis.

5.6. Pumps, Filters, and Lenses; Humanistic Issues in Calculus Reform *by Dan Kalman*

A strong advocate for a liberal arts-oriented mathematics curriculum, Kalman argues that universities "have an obligation to offer and promote [calculus and other mathematics] courses that will address ... the historical evolution of mathematics, its impact on our culture, a sense of its methodology and epistemology, and the role of aesthetics."

5.7. Lessons from Cognitive Theory for Teaching Mathematical Modeling to Freshmen *by Richard H. Elderkin*

Elderkin presents a short yet interesting essay on the advantages of introducing college freshmen to mathematical modeling in a critical inquiry seminar, despite the fact that "they are just beginning that mental maturation process which is central to developing their world views."

5.8. Reflections on Attending Three Contributed Paper Sessions on Humanistic Mathematics in Phoenix 1989 *by Peter Flusser*

Flusser lists several ways mathematics has been "dehumanized" and then poses a series of questions for further exploration on the subject.

5.9. Mathematics Appreciation: A Humanities Course *by Thomas L. Bartlow*

Abstract. Bartlow describes a course developed at Villanova University, which offers three perspectives on the connection of mathematics to other aspects of human culture: the fact that mathematics has always been part of our culture, the Pythagorean view that number is the basis of all creation, and the tradition of using geometry to structure our visual perceptions of the world.

This syllabus-like essay includes three sections: "Synopsis of the course," "Course objectives," and "General comments."

5.10. Tapping Creativity and Ingenuity of Liberal Arts Majors in a Math Course *by Helen Christensen*

Christensen contends that graph theory should be used in a liberal arts education as a mathematics course that is beneficial to students from all backgrounds, because it "has the potential for linking mathematical modeling with the everyday experiences of all students."

5.11. Introducing Undergraduates to Mathematics Information Resources *by Sallie H. Barringer*

Barringer presents three library-based assignments that will teach students "how to get information on basic research in mathematics." She contends that this is important for students who are going to use mathematics for their jobs, but also that "by using mathematics resources, students will both develop a sense of the richness and variety of mathematical research, and understand the processes and development of the discipline."

5.12. An Empowering, Participatory Research Model for Humanistic Mathematics Pedagogy *by Arthur B. Powell, Dawud A. Jeffries, and Aleshia E. Selby*

Powell, Jeffries, and Selby believe that in addition to the four known processes "involved in teaching humanistically," there exists another process

"which attends to the more general, human process of empowerment." In this report, they "present the results of the investigation into the empowering effects of [their] participatory research model and suggest its relationships to a humanistic mathematics perspective."

5.13. Abstracts of All Papers Presented at the Humanistic Mathematics Sessions in Phoenix 1989

This is a list of abstracts for all twenty-four contributions to the mentioned paper session at the 1989 Joint Mathematics Meetings. The sheer number and the wide variety of themes covered are quite impressive. Several of the abstracts belong to papers included in this issue, including Bartlow's paper on a mathematics appreciation course (§§5.9), Christensen's paper on a graph theory course for liberal arts students (§§5.10), Barringer's paper on library resources (§§5.11), and Powell *et al.*'s paper on a research model for humanistic pedagogy (§§5.12). Three others belong to papers that appear in a later issue; see Ness's essay on his liberal arts course (§§6.3) and Lucas's essay on heuristic thinking (§§6.4), both from *Newsletter* #5, and Montgomery's piece on a seminar on famous equations (§§7.7) from *Newsletter* #6.

6. Newsletter #5 (May 1990)

6.1. Overview and the editorial

This fifth issue has a light yellow cover; the cover art is once again black and white, and this time features *Archimedes being killed by a Roman soldier while trying to complete a geometric proof* (by Le Barbier, 18$^{\text{th}}$ century). The image is, according to the credits in the inside front cover, from a photo of the painting at the Cornell University Library taken by Judith Broadwin of Jericho Senior High School, New York.

This issue also begins the practice of including front and back matter, some of it on the insides of the cover pages. An Invitation to Authors states that "[e]ssays, book reviews, syllabi and letters are welcome." A list of editorial staff appears, consisting of two associate editors (Harald Ness of University of Wisconsin Center and Joel Haack of Oklahoma State University), a production manager (Lyle Wright of Harvey Mudd College) and two assistants (David Ben-Ezra and Sean Stidd, both of Harvey Mudd College),

along with Alvin White as editor. A table of contents, the new editorial, and the reprint of the editorial from *Newsletter* #1 wrap up the front matter. The back matter consists of a page on subscriptions and donations.

The editorial of this issue, once again written by White in his typical matter-of-fact tone, describes several past and upcoming events related to the *Humanistic Mathematics Network*.

6.2. The Humanistic Aspects of Mathematics and Their Importance *by Philip J. Davis*

In this beautifully written essay, which was the basis of a talk given at *Conference on Humanistic Mathematics* in 1990, Davis argues that "[m]athematics lives in both the technological and the humanistic cultures. It exhibits features that are science-like and features that one normally associates with the humanities." He then compares many aspects of mathematics with those of literature. Next, he reasons that "[i]f mathematics exhibits humanistic features, then we may reasonably expect it to promote humanistic values ... those which foster the consciousness of full human responsibility." Finally, he emphasizes the teaching of humanistic mathematics: "To teach mathematics as one of the humanities means nothing less than to teach that it possesses the awesome power to influence and change our lives, and to teach that we who use it and foster it must subject it to constant study and scrutiny."

6.3. Mathematics - A Significant Force in Our Culture *by Harald M. Ness*

After mentioning some what he calls "disturbing" misconceptions about mathematics held by university students, professors, and administrators, Ness believes it is imperative that we "communicate to students and the public that mathematics is not simply a set of skills to solve mundane problems, but a vast body of knowledge that is an integral part of our culture."

Ness is very clear in his essay about his principles and objectives. He states that an ideal mathematics education should involve "the study of mathematics as an integral part of our culture, not only the contributions of mathematics to our culture, but how the culture has influenced the development of mathematics." He also presents an extensive bibliography at the end of the article.

6.4. Heuristic Thinking and Mathematics *by J. F. Lucas*

Lucas argues that "[b]efore our students can achieve real learning of mathematics, they need to develop a proper perspective on the nature of the subject, itself." He proceeds to list "five common myths that tend to block mathematical learning." He then discusses "heuristic thinking" and gives some "classroom suggestions."

6.5. Preparing Teachers to Teach Mathematics within a Humanistic Perspective *by Beatriz S. D'Ambrosio*

D'Ambrosio reports on a class, "Finite Mathematics," that she taught in Brazil. This class was designed to "educate future teachers within a humanistic perspective."

6.6. Advanced Displacement Exam *by Robert Messer*

This is a whimsical matching play-on-words test compiled by Messer.

6.7. Real Needs of School Children *by Hassler Whitney*

Starting with some hypothetical questions posed by a child, this essay explores the state of the school systems.

6.8. Mathematics and Ethics *by Reuben Hersh*

Hersh provides a brief meditation on ethical issues mathematicians may face: "[if] you ... just think about your own activity, or mine, think of what we actually do, daily and yearly, there are constant decisions and conflicts involving right and wrong." His conclusion is that "[i]f our research work is almost devoid of ethical content, then it becomes all the more essential to heed our general ethical obligation as citizens, teachers and colleagues, lest the temptation of the ivory tower rob us of our human nature."

6.9. Teaching Global Issues Through Mathematics *by Richard H. Schwartz*

In this article, Schwartz introduces a course called "Mathematics and the Environment" that he has developed at the College of Staten Island. He comments on the benefits, values, and specific methods of teaching such a course.

This thread has been picked up recently by many others who have been actively engaged in incorporating global issues like social justice, sustainability, and climate change into their mathematics classrooms; it is interesting to read similar concerns articulated over two decades ago.

6.10. A Social View of Mathematics: Implications for Mathematics Education *by Stephen Lerman*

Lerman points out that "there are distinct consequences of a social view of mathematical knowledge." He then gives some examples to explain those consequences.

6.11. What Has Mathematics Got to Do with Values? *by Stephen Lerman*

In this follow-up article, Lerman concludes that "[m]athematics teachers cannot claim that issues of justice, morality, freedom, values, are for the discussions in English lessons, or History, or Personal and Social Education, or Geography, but not Mathematics," and that mathematics educators "have a special responsibility, since mathematical techniques and methods are often developed for, and used in, social decisions."

7. Newsletter #6 (May 1991)

7.1. Overview and the editorial

This sixth issue has a light green cover, with cover art featuring two figures of sand tracings by the Malekula from Vanuatu in the South Pacific. A brief description is provided in the credits to the cover art, accompanied by a reference to Ascher's text on ethnomathematics [1]. The Invitation to Authors and the list of the editorial staff remain on the front inside cover.[7] A two-page table of contents, the reprint of the editorial from *Newsletter* #1, and the new editorial wrap up the front matter.

This issue is a double issue, spanning ninety-eight pages, and includes contributions from eighteen different authors. White writes in his editorial that the movement is maturing:

[7]Most of the staff remains the same. Note however that the assistants have changed and multiplied; six new Harvey Mudd College names are listed this time (Marci Dougherty, Lisa Gragg, Mark Schaal, Gene VanNostem, Steve Wakisaka, Kathy Yano), along with one from Scripps College (Christa Pickens).

> Fewer people are still asking, "What is Humanistic Mathematics?" More people are doing Humanistic Mathematics in their research, writing, teaching and organizing (conferences, seminars, etc.) [...] The variety of essays in this issue indicates the scope of Humanistic Mathematics. History, philosophy, poetry, hermeneutics, integrity, teaching ... are all part of the movement [10].

7.2. The Calculus Virgin *by Louis Leithold*

This is a brief announcement of a seminar that Leithold was scheduled to hold at the 1992 annual meeting of the Mathematical Association of America in Baltimore about a poet's impression of calculus. The poet, d'Arcy Hayman, had never learned calculus before she attended a seminar led by Leithold on advanced placement calculus. However, she had a "passionate and thrilling response" to the experience.

7.3. The Teaching of Arithmetic I, II, III: The Story of an Experiment *by Louis Paul Benezet*

This is a reprint of three pieces by Benezet, first published in the *Journal of National Education Association* [2, 3, 4]. White explains in his editorial:

> In her recollections of Hassler Whitney (1907–1989) in *Newsletter* #4,[8] Anneli Lax mentioned the report by L. P. Benezet of an educational experiment on the formal teaching of arithmetic that Hassler distributed widely. With permission from the Journal of the National Education Association, Benezet's report is reprinted here in response to several requests and as a memorial to Hassler Whitney [10].

Benezet's papers are an extensive account of an educational experiment that he performed in Manchester, New Hampshire, starting in 1929. The first paper [2] explains the motivation and a small-scale version of the experiment. The second paper [3] details the experiment as it is conducted on a large scale. The third paper [4] gives a survey through examples of the success of the experiment in a normal school district.

[8] See §§5.2.

7.4. Leibniz - Beyond the Calculus *by Hardy Grant*

Abstract. Leibniz figures in the standard histories of mathematics mostly as sharing, with Newton, the main credit for the first significant formulation of the calculus. That is appropriate in the sense that there indeed lay his most vital and enduring contribution to the subject. But such a focus limits considerably the role of mathematics in Leibniz' own life and thought. Mathematical considerations also suggested, crystallized, governed in many pivotal ways the metaphysical system that places him among the West's supreme philosophers. What follows is an attempt to outline some features of this broader picture, to correct the sometime fragmentations in our estimate of his work, to see his mathematical activity as a whole.

7.5. An Historical Approach to Precalculus and Calculus *by Victor J. Katz*

In this paper, Katz proposes a way to teach pre-calculus and calculus through what he calls "an historical approach." He explains his philosophy that "[a]n historical approach to these courses helps to provide a solid motivation for the learning of mathematics as it ties together much of the students' backgrounds in history and literature with their scientific studies."

7.6. An Alternative Approach to the History of Mathematics *by Claudia Henrion*

In this short piece, Henrion discusses "an alternative approach to the history of mathematics, one that would be of interest to potential mathematicians and non-mathematicians alike." This approach is meant to make math history courses more interesting and meaningful. This article contains a detailed presentation of the syllabus of Henrion's course entitled "History of Mathematics," as well as her teaching philosophies.

7.7. Student Seminars on "Famous Equations" *by Richard G. Montgomery*

Montgomery believes that "[t]reasures often lie obscure in mathematics programs constrained by rigid syllabi and taxing workloads." In order for students to explore great mathematical thoughts, Montgomery designed a seminar on "famous equations."

7.8. The Human/Computer Interface: Their Side or Ours? *by R. S. D. Thomas*

In this paper, Thomas examines the idea that "there is a human/computer interface and that humans are on the side opposite to the computers." He talks about how computers should be used by mathematics students to their advantage.

7.9. Augsburg's Humanistic Curriculum Project *by L. Copes and B. Stratton*

Abstract. The Department of Mathematics at Augsburg College has embarked on a project to replace the traditional calculus/linear algebra sequence for mathematics and science majors with a curriculum more representative of the ideas and humanistic processes of mathematics.

Details of the project at Augsburg College are explicitly discussed.

7.10. Ethics in Mathematics: A Request for Information *by Robert P. Webber*

In this brief request for help, the author, attempting to design a new college course on "ethics in mathematics," seeks suggestions from the readers of the journal.

7.11. How Mathematics Teachers Use "Writing to Learn" *by Susan Hunter*

Abstract. The essays collected in *Writing to Learn Mathematics and Science* present new ideas about how teachers are using writing to enable their students' conceptual learning in mathematics and science classes. Their students are not merely writing about topics in these disciplines; instead students are actually writing to learn mathematics and science. A number of features distinguish this book as practical and thought-provoking for writing teachers like me who'd like to affect our students beyond the freshman composition classroom, as well as for those of you who teach mathematics as one of the humanities. In the 23 essays collected here, not composition specialists, but mathematicians and scientists who have used it in their classrooms present the pedagogy of "writing to learn." Thirteen of the essays are by mathematicians who describe how they have used natural written language as an

integral part of these teaching from the elementary to the college level. These teachers offer practical advice and examples of assignments that I believe you'll want to experiment with in courses at your institutions. Some assignments may resemble those you already use, and here you'll read the theories behind why they work and how they can be made to work even better. These teachers and their assignments show how the "writing across the curriculum" movement has affected mathematics programs across the country.

This article is a review of the book *Writing to Learn*, edited by Paul Connolly and Teresa Vilardi. After over two decades, writing in mathematics courses remains a novel idea, though many more proponents of the methodology exist.

7.12. Mathematics and Philosophy: The Story of a Misunderstanding *by Gian-Carlo Rota*

In this essay, Rota contends that "the attempt carried out by certain philosophers in this century to parrot the language, the method, and the results of mathematics has done harm to philosophy. Such an attempt results from a misunderstanding of both mathematics and philosophy, and has done harm to both subjects."

7.13. Mathematics: Contributions by Women *by Jacqueline M. Dewar*

Abstract. Neither history nor a liberal arts education gives much recognition to mathematicians – regardless of their sex. Therefore it is not surprising that women have had almost no recognition in a field where men have had so little. It has been argued that this helps perpetuate the impression that math is a male domain. To combat this myth the author has developed a course for liberal arts students that includes the study of the biographies of 12-14 women mathematicians and of mathematical topics related to their work. In addition, math anxiety, math avoidance and sex-related differences in mathematics learning are investigated. At Loyola Marymount University this course can count toward the science core curriculum requirement or as a core course in the women's studies program. This paper will describe

> the course and provide information, resources, and an annotated bibliography useful for making students more aware of women's contributions to mathematics.

Without a slice of doubt, women have made great contributions to the mathematics discipline, yet sadly after over two decades since the writing of this essay, we still consider women as an underrepresented group in the mathematical sciences.

7.14. Mathematics and Poetry: Isolated or Integrated? *by JoAnne S. Growney*

Growney compares mathematics with poetry, in an attempt to increase students' interest in studying mathematics.

7.15. Ultimately, Mathematics is Poetry *by Alfred Warrinnier*

In this article, Warrinnier invites the readers to explore the similarities between mathematics and poetry. Examples are drawn from both early and contemporary times.

7.16. The Hermeneutics of Mathematical Modeling *by David Tudor*

Tudor analyzes "the historical and philosophical background of the division between pure and applied mathematics," with the hope that "a better understanding of the objectives and limitations of the use of mathematical models will contribute to the increased acceptance of them as a means of providing additional information and perspectives in areas of research traditionally considered 'non-quantitative.'"

7.17. On Teaching in the Mathematical Sciences *by James M. Cargal*

Cargal's article offers suggestions about how to be a great math teacher. In particular, he addresses "the personal side of teaching," "teaching style," "developmental psychology," "motivation," and "the war of the students and the teachers," among other things.

7.18. Mathematics, Truth and Integrity *by P. Hilton and J. Pedersen*

This article discusses "an inescapable ethical component to mathematics as a human activity." Two topics compose this article: "communicating ethical values to students" and "the ethics of mathematics in everyday life."

7.19. Mathematics for Life and Society *by Miriam Lipschutz-Yevick*

Abstract. A course (3 credit) by the title above was developed and taught to adult evening students as an alternative to a Basic Skills and Elementary Algebra remedial course. Quantitative concepts were acquired by extracting these from concrete social, economic and political problems of direct interest to the students. Applications considered were, for instance: The Consumer Price Index; Optimizing mass transit fares; Estimating world food and energy production; Population growth and extinction; Keynesian multiplier effect etc.

This article also includes an addendum entitled "Mathematics as a consciousness raiser," in which Lipschutz-Yevick proposes ways to popularize mathematics.

8. The Humanistic Mathematics Network Journal

After the sixth issue, the seventh issue came out under a different name: *Humanistic Mathematics Network Journal*. White in his editorial to the seventh issue explained:

> The change of name from *Newsletter* to *Journal* recognizes the maturation of this publication. The new name has been recommended by many. Patricia Kenschaft of Montclair State College, NJ suggested that the new name would be more accurate and useful [11].

The *Humanistic Mathematics Network Journal* (also known as *HMNJ*) had several issues, approximately two every year, from 1992 till 2002, with White continuing on as the editor. Then a last issue, edited by Sandra Keith, at the time of St. Cloud State University, MN, appeared as an online-only issue in 2004.

On the next page we present a list of the issues of *HMNJ* (along with their publication dates).

- *Humanistic Mathematics Network Journal* #7 (April 1992);
- *Humanistic Mathematics Network Journal* #8 (July 1993);[9]
- *Humanistic Mathematics Network Journal* #9 (February 1994);
- *Humanistic Mathematics Network Journal* #10 (August 1994);
- *Humanistic Mathematics Network Journal* #11 (February 1995);
- *Humanistic Mathematics Network Journal* #12 (October 1995);
- *Humanistic Mathematics Network Journal* #13 (May 1996);
- *Humanistic Mathematics Network Journal* #14 (November 1996);
- *Humanistic Mathematics Network Journal* #15 (July 1997);
- *Humanistic Mathematics Network Journal* #16 (November 1997);
- *Humanistic Mathematics Network Journal* Issue #17 (May 1998);[10]
- *Humanistic Mathematics Network Journal* Issue #18 (November 1998);
- *Humanistic Mathematics Network Journal* Issue #19 (March 1999);
- *Humanistic Mathematics Network Journal* Issue #20 (July 1999);
- *Humanistic Mathematics Network Journal* Issue #21 (December 1999);
- *Humanistic Mathematics Network Journal* Issue #22 (April 2000);
- *Humanistic Mathematics Network Journal* Issue #23 (September 2000);

[9]This was also when *HMNJ* obtained an ISSN: 1065-8297. From that point onwards, the inside front cover material included a Note to Librarians:

> The Humanistic Math Network Journal #8-current (ISSN # 1065-8297) is the successor to the Humanistic Math Network Newsletter (ISSN # 1047-627X).

[10]Note the change from counting issues merely by number # (e.g., #16) to the inclusion of the word "Issue" (e.g., "Issue #17").

- *Humanistic Mathematics Network Journal* Issue #24 (May 2001);[11]
- *Humanistic Mathematics Network Journal* Issue #25 (August 2001);
- *Humanistic Mathematics Network Journal* Issue #26 (June 2002);
- *Humanistic Mathematics Network Journal* Issue #27 (Spring/Winter 2004) [this was published online only].[12]

Each of the print issues spanned at least 42 pages[13] and covered diverse themes that had become the norm for the publication. The online issue (#27) contained eighteen unique pieces, as well as a brief note from White on teaching and learning mathematics and a handful of poems by Marion Cohen.

9. The Aftermath

The 2004 online issue of *HMNJ* was the last one that appeared, but as we see it, the echoes of the *Humanistic Mathematics Network*, the *Newsletter*, and the *Journal* still remain. In particular, as one of us (C.S.) witnessed firsthand as a student editor, the *Journal of Humanistic Mathematics* was founded in part to continue to emphasize what White found was a central and commonly shared belief for those who were inspired by the notion of humanistic mathematics, namely that:

> Mathematics is common to all ... it is not the mathematics of facts, formulas, and algorithms ... It is not the mathematics of anxiety and boredom. It is the mathematics of confidence and optimism. There is excitement, erudition, adventure. ... Humanistic mathematics opens up a mathematical world of excitement, adventure, and satisfaction [12].

[11] Subscribers received, along with this issue, an accompanying booklet of thirty-seven pages entitled *Number and Faces: A Collection of Poems with Mathematical Imagery*, edited by JoAnne Growney.

[12] Available at http://www2.hmc.edu/www_common/hmnj/, accessed June 27, 2012.

[13] Seventeen out of twenty-one went over fifty pages; five went over sixty.

More generally, today's mathematics meetings welcome poetry readings and art exhibits; there are multiple paper sessions and over a hundred presentations at the annual mathematics meetings on teaching mathematics well, with many focusing on student experiences; there are special interest groups of the Mathematical Association of America that investigate the connections of our field to philosophy, history, and the arts, with a view toward understanding the place of mathematics in the wider world; there are special tightly-knit communities that bring together mathematics and the arts in their mission statement as well as in their regular activities. All in all, most, if not all, of the themes that were deemed controversial and inappropriate for mathematicians to converse upon at the time of the beginning of the *Humanistic Mathematics Network* movement are now mainstream. In some sense, the time of humanistic mathematics has arrived, and is all around us; one only needs to look. We hope that our report will encourage readers to reflect upon the significant contributions of the *Humanistic Mathematics Network Newsletter* to this beautiful unfolding.

Acknowledgments: C.S. was supported by a *Venture Grant* from Colorado College and a *Hahn Teaching with Technology* grant from Pomona College during the time work on this report was initiated. We both thank Mark Ashley, Micki Brose, Gizem Karaali, and Myra White for comments, suggestions, and (factual and moral) support during the writing of this report.

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[7] John Milton, *Paradise Lost*, 1674. Many printings, also available online at http://www.dartmouth.edu/~milton/reading_room/pl/book_1/index.shtml as part of: Thomas H. Luxon, ed. *The Milton Reading Room*, http://www.dartmouth.edu/~milton, March 2008, accessed July 2, 2012.

[8] Alvin White, Letter from the Editor (untitled), *Humanistic Mathematics Network Newsletter* #1 (Summer 1987), no page numbers. Reprinted in all other *Newsletter* issues and several issues of the *Humanistic Mathematics Network Journal*.

[9] Alvin White, Letter from the Editor (untitled), *Humanistic Mathematics Network Newsletter* #2 (March 1988), no page numbers.

[10] Alvin White, "From the Editor," *Humanistic Mathematics Network Newsletter* #6 (May 1991), no page numbers.

[11] Alvin White, "From the Editor," *Humanistic Mathematics Network Journal* #7 (April 1992), no page numbers.

[12] Alvin White, "Preface," *Essays in Humanistic Mathematics*, MAA Notes Issue 32, Mathematical Association of America, Washington DC, 1993, pages *vii-viii*.

[13] Personal records of Alvin White, communicated by Myra White.