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10. The following people have provided valuable feedback and suggestions during the development of the library: Ion Gaztañaga, Janek Kozicki, Tobias Schwinger, Pavel Vozenílek. Simon Atanasyan contributed a workaround for a problem with Sun Studio compilers. Rosa Bernárdez has proofread the documentation from the first drafts up to its present form.

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Torjo, Markus Werle. Alberto identified important limitations of the initial design, which led to the introduction of key-value flyweights.

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Boost.Flyweight serialization uses the newly introduced helper support functionality of the Boost Serialization Library from Robert Ramey. Without helper support, serialization of flyweights would have been unacceptably costly in terms of archive space consumption.

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Boost Spirit (LL parser framework that represents parsers directly as EBNF grammars in inlined C++)
Boost Iterator Adaptor Library (Adapt a base type into a standard conforming iterator)
Boost Filesystem Library (Portable paths, iteration over directories, and other useful filesystem operations)
Boost Program options and arguments library

and other small parts of different Boost libraries.

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Boost.Test 3.0 is being developed and maintained by Gennadiy Rozental and Raffi Enficiaud.

New documentation
Raffi Enficiaud and Andrzej Krzemienski efforts were a driving force behind the Boost.Test documentation overhaul.

Second incarnation including the Unit Test Framework
Beman Dawes and Ullrich Koethe started the library. Fernando Cacciola, Jeremy Siek, Beman Dawes, Ullrich Koethe, Dave Abrahams suggested numerous improvements during the Formal Review. Jeremy Siek was the review manager. Beman Dawes was a great help in both final testing and merging library with rest of the boost. Gennadiy Rozental was the developer and maintainer.

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24. Beman Dawes provided the original config.hpp and part of this document.

Vesa Karvonen provided a description of the principles (see rationale) and put together an early version of the current configuration setup.

John Maddock put together the configuration current code, the test programs, the configuration script and the reference section of this document.

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The Wave library uses the following Boost [8] libraries:

Boost Spirit (LL parser framework that represents parsers directly as EBNF grammars in inlined C++)
Boost Iterator Adaptor Library (Adapt a base type into a standard conforming iterator)
Boost Filesystem Library (Portable paths, iteration over directories, and other useful filesystem operations)
Boost Program options and arguments library

and other small parts of different Boost libraries.

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David B. Held
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Mat Marcus
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Paul Mensonides
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28. Thomas Witt in 2002 produced a prototype called cyclic buffer.

The circular_buffer has a short history. Its first version was a std::deque adaptor. This container was not very effective because of many reallocations when inserting/removing an element. Thomas Wenish did a review of this version and motivated me to create a circular buffer which allocates memory at once when created.

The second version adapted std::vector but it has been abandoned soon because of limited control over iterator invalidation. The current version is a full-fledged STL compliant container.

Pavel Vozenilek did a thorough review of this version and came with many good ideas and improvements.

The idea of the space optimized circular buffer has been introduced by Pavel Vozenilek.

Also, I would like to thank Howard Hinnant, Nigel Stewart and everyone who participated at the formal review for valuable comments and ideas.

Paul A. Bristow refactored the documentation in 2013 to use the full power of Quickbook, Doxygen and Autoindexing.

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30. Boost.Accumulators represents the efforts of many individuals. I would like to thank Daniel Egloff of Zürcher Kantonalbank for helping to conceive the library and realize its implementation. I would also like to thank David Abrahams and Matthias Troyer for their key contributions to the design of the library. Many thanks are due to Michael Gauckler and Olivier Gygi, who, along with Daniel Egloff, implemented many of the statistical accumulators.

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Especially Eugene Yakubovich, Giovanni Piero Deretta and Vicente J. Botet Escriba contributed many good ideas during the review.

34. Thomas Witt in 2002 produced a prototype called cyclic buffer.

The circular_buffer has a short history. Its first version was a std::deque adaptor. This container was not very effective because of many reallocations when inserting/removing an element. Thomas Wenish did a review of this version and motivated me to create a circular buffer which allocates memory at once when created.

The second version adapted std::vector but it has been abandoned soon because of limited control over iterator invalidation. The current version is a full-fledged STL compliant container.

Pavel Vozenilek did a thorough review of this version and came with many good ideas and improvements.

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Also, I would like to thank Howard Hinnant, Nigel Stewart and everyone who participated at the formal review for valuable comments and ideas.

Paul A. Bristow refactored the documentation in 2013 to use the full power of Quickbook, Doxygen and Autoindexing.

35. Thanks go to the following people for supporting the development of this library in one or the other way:

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Steven Watanabe
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36. Boost.Accumulators represents the efforts of many individuals. I would like to thank Daniel Egloff of Zürcher Kantonalbank for helping to conceive the library and realize its implementation. I would also like to thank David Abrahams and Matthias Troyer for their key contributions to the design of the library. Many thanks are due to Michael Gauckler and Olivier Gygi, who, along with Daniel Egloff, implemented many of the statistical accumulators.

I would also like to thank Simon West for all his assistance maintaining Boost.Accumulators.

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37. Boost.Egg: A very powerful library for function objects in C++98.
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Boost.Hana: A metaprogramming library with many functional constructs
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Douglas Gregor developed 'type_with_alignment', and later Eric Friedman coded 'aligned_storage', which are the core of the optional class implementation.

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40. The format and language of this reference documentation has been greatly influenced by the SGI's Standard Template Library Programmer's Guide.

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- Shunsuke Sogame
[Boost.Hana](https://github.com/ldionne/hana): A metaprogramming library with many functional constructs
- Louis Dionne
[named-operators](https://github.com/klmr/named-operator): A library to create named operators

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- Konrad Rudolph
[Pack/Unpack without Using
Tuple](http://jamboree.github.io/cout/tricks/2014/07/21/pack-unpack-without-using-tuple.html)
- Jamboree
[for_each_argument](http://isocpp.org/blog/2015/01/for-each-argument-sean-parent)
- Sean Parent
[Suggested Design for Customization Points](http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2015/n4381.html)
- Eric Niebler
[FC++](https://yanniss.github.io/fc++/): Functional Programming in C++
- Brian McNamara and Yannis Smaragdakis
[Boost.Phoenix](http://www.boost.org/doc/libs/1_59_0/libs/phoenix/doc/html/index.html)
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[*Chris Hoeppler] submitted the __qi_confix__ parser directive allowing to embed a parser (the subject) inside an opening (the prefix) and a closing sequence (the suffix).

[*Francois Barel] contributed the __qi_subrule__ parser and __karma_subrule__ generator components, allowing to create a named parser or generator, and to refer to it by name. These components are in fact fully static versions of the corresponding `rule` component.

[*Thomas Bernard] contributed the __qi_keywords__ and __qi_keywords_list__ parser components, allowing to define keyword parsers.

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__GOOGLE_SOC_2006__

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Doug Gregor suggested that a visitor mechanism would allow `bind` to interoperate with a signal/slot library.

John Maddock fixed a MSVC-specific conflict between `bind` and the

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[@boost:/libs/type_traits/index.html type traits library].

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56. The author can be contacted at john - at - johnmaddock.co.uk; the home page for this library is at [@http://www.boost.org www.boost.org].

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57. Beman Dawes provided the original `config.hpp` and part of this document.

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John Maddock put together the configuration current code, the test programs, the configuration script and the reference section of this document.

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58. The first Boost.Process draft was created in 2006. A lof of people have worked on various drafts since then. Especially Merino Vidal, Ilya Sokolov and Felipe Tanus spent a lot of time working on early drafts. They influenced Boost.Process over the years and wrote code which, to various extents, is still around in the library today.

The design of earlier versions of Boost.Process was not always satisfying. In 2011 Jeff Flinn proposed the executor and initializer concepts Boost.Process is based on today. Without Jeff's idea the overall design of Boost.Process would not look like it does today.

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59. I'd like to thank Alex Hagen-Zanker, Christopher Kormanyos, Conrad Poelman, Eugene Yakubovich, Giovanni Piero Deretta, Hartmut Kaiser, Jeffrey Lee Hellrung, [*Nat Goodspeed], Robert Stewart, Vicente J. Botet Escriba and Yuriy Krasnoschek.

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60. This section aims to recognize the contributions of /all/ the different people that participated directly or indirectly to the design and development of this library.

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Thanks to everyone that commented on the library during its Boost review.

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Finally, many thanks to the entire __Boost__ community and [@http://lists.boost.org mailing list] for providing valuable comments about this library and great insights on the C++ programming language.

61. I am indebted to [@http://boost.org/people/joel_de_guzman.htm Joel de Guzman] and [@http://boost.org/people/hartmut_kaiser.htm Hartmut Kaiser] for their expert advice during the early states of xpressive's development. Much of static xpressive's syntax is owes a large debt to _spirit_, including the syntax for xpressive's semantic actions. I am thankful for [@http://boost.org/people/john_maddock.htm John Maddock]'s excellent work on his proposal to add regular expressions to the standard library, and for various ideas borrowed liberally from his regex implementation. I'd also like to thank [@http://moderncppdesign.com/ Andrei Alexandrescu] for his input regarding the behavior of nested regex objects, and [@http://boost.org/people/dave_abrahams.htm Dave Abrahams] for his suggestions regarding the regex domain-specific embedded language. Noel Belcourt helped porting xpressive to the Metrowerks CodeWarrior compiler. Markus Sch'''ö'''pflin helped to track down a bug on HP Tru64, and Steven Watanabe suggested the fix.

Special thanks are due to David Jenkins who contributed both ideas, code and documentation for xpressive's semantic actions, symbol tables and attributes. Xpressive's ternary search trie implementation is David's, as is the number parser example in [^libs/xpressive/example/numbers.cpp] and the documentation for symbol tables and attributes.

Thanks to John Fletcher for helping track down a runtime assertion when using xpressive with Howard Hinnant's most excellent libc++.

Finally, I would like to thank [@http://boost.org/people/thomas_witt.html Thomas Witt] for acting as xpressive's review manager.

62. The original implementation of __boost_thread__ was written by William Kempf, with contributions from numerous others. This new version initially grew out of an attempt to rewrite __boost_thread__ to William Kempf's design with fresh code that could be released under the Boost Software License. However, as the C++ Standards committee have been actively discussing standardizing a thread library for C++, this library has evolved to reflect the proposals, whilst retaining as much backwards-compatibility as possible.

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Vicente J. Botet Escriba
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Peter Dimov

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Neal D. Becker
Misha Bergal
James Curran
Carl Daniel
Beman Dawes
Tanton Gibbs
Holger Grund
Hartmut Kaiser
Petr Kocmid
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Chuck Messenger
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Matthias Troyer
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Joseph Wu
Ferdinand Prantl
Miro Jurisic
John Maddock
Janusz Piwowarski
Charles Brockman
Jonathan Wakely

67. Hartmut Kaiser implemented the original lazy casts and constructors based on his original work on Spirit SE "semantic expressions" (the precursor to Phoenix), and guided Phoenix from the initial review of V2 to the release of V3.

Eric Niebler did a 2.0 pre-release review and wrote some range related code that Phoenix stole and used in the algorithms. Additionally he played the leading role in inventing the extension mechanism as well as providing early prototypes and helping with Boost.Proto code. DA Proto MAN!

Angus Leeming implemented the container functions on Phoenix-1 which I then ported to Phoenix-2.

Daniel Wallin helped with the scope module, local variables, let and lambda and the algorithms. I frequently discuss design issues with Daniel on Yahoo Messenger.

Jaakko Jarvi. DA Lambda MAN!

Dave Abrahams, for his constant presence, wherever, whenever.

Aleksey Gurtovoy, DA MPL MAN!

Doug Gregor, always a source of inspiration.

Dan Marsden, did almost all the work in bringing Phoenix-2 out the door.

Thorsten Ottosen; Eric's range_ex code began life as "container_algo" in the old boost sandbox, by Thorsten in 2002-2003.

Jeremy Siek, even prior to Thorsten, in 2001, started the "container_algo".

Vladimir Prus wrote the mutating algorithms code from the Boost Wiki.

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The original idea for the library came from the example stream buffer implementations in Standard C++ IOStreams and Locales, by Angelika Langer and Klaus Kreft ([Langer]). Robert Ramey suggested extending the library to handle filtering. In addition:

The implementation of stream_buffer is indebted to work of Angelika Langer and Klaus Kreft ([Langer], pp. 228-43).
The filtering stream buffer concept was invented by James Kanze and Dietmar Kühl. See [Kanze].
The concepts InputFilter and OutputFilter were inspired by James Kanze's extractors and inserters. In addition, the names of the components filtering_stream and filtering_streambuf are borrwed from Kanze, as are several of the Filters from the Tutorial. See [Kanze].
Pipelines were introduce by Jan Christiaan van Winkel and John van Krieken. See [van Winkel]. Dietmar Kühl suggested adding this functionality to the Iostreams library.
The facility for adding iterator ranges and output iterators to filter chains was inspired by work of Maxim Egorushkin. See [Egorushkin].

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71. Hartmut Kaiser implemented the original lazy casts and constructors based on his original work on Spirit SE "semantic expressions" (the precursor to Phoenix), and guided Phoenix from the initial review of V2 to the release of V3.
Eric Niebler did a 2.0 pre-release review and wrote some range related code that Phoenix stole and used in the algorithms. Additionally he played the leading role in inventing the extension mechanism as well as providing early prototypes and helping with Boost.Proto code. DA Proto MAN!
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Jaakko Jarvi. DA Lambda MAN!
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Aleksey Gurtovoy, DA MPL MAN!
Doug Gregor, always a source of inspiration.
Dan Marsden, did almost all the work in bringing Phoenix-2 out the door.
Thorsten Ottosen; Eric's range_ex code began life as "container_algo" in the old boost sandbox, by Thorsten in 2002-2003.
Jeremy Siek, even prior to Thorsten, in 2001, started the "container_algo".
Vladimir Prus wrote the mutating algorithms code from the Boost Wiki.
Daryle Walker did a 2.0 pre-release review.

72. I am indebted to Joel de Guzman and Hartmut Kaiser for their expert advice during the early states of xpressive's development. Much of static xpressive's syntax is owes a large debt to Spirit, including the syntax for xpressive's semantic actions. I am thankful for John Maddock's excellent work on his proposal to add regular expressions to the standard library, and for various ideas borrowed liberally from his regex implementation. I'd also like to thank Andrei Alexandrescu for his input regarding the behavior of nested regex objects, and Dave Abrahams for his suggestions regarding the regex domain-specific embedded language. Noel Belcourt helped porting xpressive to the

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Metrowerks CodeWarrior compiler. Markus Schöpflin helped to track down a bug on HP Tru64, and Steven Watanabe suggested the fix.

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Thanks to John Fletcher for helping track down a runtime assertion when using xpressive with Howard Hinnant's most excellent libc++.

Finally, I would like to thank Thomas Witt for acting as xpressive's review manager.

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74. This section tries to recognize the contributions of all the different people that participated directly or indirectly to the design and development of this library.

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Thomas Taylor, Richard Crossley, Semen, and Adalberto Castelo for their help in isolating problems while testing the new attribute handling code released with V2.5.

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Joao Abecasis for his early support and involvement in Spirit2 development and for disturbing my peace every once in a while for a couple of jokes.

The list goes on and on... if you've been mentioned thank Joel and Hartmut, if not, kick Joao :-)

Acknowledgements from the Spirit V1 classic Documentation
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Dan Nuffer for his work on lexers, parse trees, ASTs, XML parsers, the multi-pass iterator as well as administering Spirit's site, editing, maintaining the CVS and doing the releases plus a zillion of other chores that were almost taken for granted.

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John Maddock, our review manager, Aleksey Gurtovoy, Andre Hentz, Beman Dawes, Carl Daniel, Christopher Currie, Dan Gohman, Dan Nuffer, Daryle Walker, David Abrahams, David B. Held, Dirk Gerrits, Douglas Gregor, Hartmut Kaiser, Iain K.Hanson, Juan Carlos Arevalo-Baeza, Larry Evans, Martin Wille, Mattias Flodin, Noah Stein, Nuno Lucas, Peter Dimov, Peter Simons, Petr Kocmid, Ross Smith, Scott Kirkwood, Steve Cleary, Thorsten Ottosen, Tom Wenisch, Vladimir Prus

Finally thanks to SourceForge for hosting the Spirit project and Boost: a C++ community comprised of extremely talented library authors who participate in the discussion and peer review of well crafted C++ libraries.

77. This section aims to recognize the contributions of all the different people that participated directly or indirectly to the design and development of this library.

Many thanks to Steven Watanabe and Vicente Botet for suggesting to me to use Boost.ScopeExit binding to emulate local functions. Many thanks to Alexander Nasonov for clarifying how Boost.ScopeExit binding could be used to implement local functions and for some early work in this direction.

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Many thanks to Jeffrey Lee Hellrung for managing the Boost review of this library. Thanks also to all the people that submitted a Boost review: Andrzej Krzemienski, Edward Diener, Gregory Crosswhite, John Bytheway, Hartmut Kaiser, Krzysztof Czainski, Nat Lindon, Pierre Morcello, Thomas Heller, and Vicente J. Botet. Thanks to everyone that commented on the library during its Boost review.

Finally, many thanks to the entire Boost community and mailing list for providing valuable comments about this library and great insights on the C++ programming language.

78. Many thanks to Mathias Gaunard for suggesting to implement boost::overloaded_function and for some sample code.

Thanks to John Bytheway for suggesting to implement boost::make_overloaded_function.

Thanks to Nathan Ridge for suggestions on how to implement boost::make_overloaded_function.

Thanks to Robert Stewart for commenting on the library name.

Many thanks to the entire Boost community and mailing list for providing valuable comments about this library and great insights on the C++ programming language.

79. The Spirit repository is the result of the contributions of active members of the Spirit community. We would like to express our thanks to all who directly contributed and to everybody directly or indirectly involved in the discussions, which led to the creation of the parser and generator components.

The following people have directly contributed code to this repository:

Aaron Graham wrote the advance parser component, which allows the parser to skip (advance) through a specified number of iterations without performing unnecessary work.

Chris Hoeppler submitted the confix parser directive allowing to embed a parser (the subject) inside an opening (the prefix) and a closing sequence (the suffix).

Francois Barel contributed the subrule parser and subrule generator components, allowing to create a named parser or generator, and to refer to it by name. These components are in fact fully static versions of the corresponding rule component.

Thomas Bernard contributed the keyword_list and kwd()[] parser components, allowing to define keyword parsers.

80. Dan Nuffer for his work on lexers, parse trees, ASTs, XML parsers, the multi-pass iterator as well as administering Spirit's site, editing, maintaining the CVS and doing the releases plus a zillion of other chores that were almost taken for granted.

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David Abrahams
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Noah Stein
Nuno Lucas
Peter Dimov
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Tom Wenisch
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81. The library uses Peter Dimov's implementation of std::make_index_sequence. Manu Sánchez aided immensely with CI setup and performance testing. Sehe contributed performance results for GCC 5.2, and Francisco José Tapia for Clang 3.9.

The Boost acceptance review took place between the 3rd and 17th of May, 2017. Thank you to Ion Gaztañaga for smoothly managing the process. The following people participated with full reviews or valuable comments: Pete Bartlett, Hans Dembinski, Dominique Devienne, Edward Diener, Vinnie Falco, Ion Gaztañaga, Andrzej Krzemienski, Brook Milligan, Thorsten Ottosen, Steven Watanabe, Adam Wulkiewicz. Many thanks to all of them. Steven Watanabe gave crucial help in solving some hard problems related to the usage of Boost.TypeErasure.

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In memory of Joaquín López Borrella (1939-2015), in memory of Héctor (2004-2017): may your ghosts keep us company.

82. I would like to thank CEO Hermann Steppe and Chief Developer Peter Wuttke of Cortex Software GmbH for their friendly support of my work on the Icl and their permission to release the library as open source. For her genuine interest in my work and many creative and uplifting talks I want to thank my colleague Axinja Ott who contributed a lot to the success of the project.

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I am grateful to Hartmut Kaiser for managing the formal review of this library and to all the reviewers and participants in the related discussions, including Jeff Flinn, Luke Simonson, Phil Endecott, Eric M. Jonas, Peter Wuttke, Robert Stewart, Barend Gehrels, Vicente Botet, Thomas Klimpel, Paul A. Bristow, Jerry Jeremiah, John Reid, Steven Watanabe, Brian Wood, Markus Werle and Michael Caisse.

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83. We like to thank all the people who helped to develop this library.

First of all we are grateful to Hartmut Kaiser for managing the formal review of this library. Hartmut is an excellent review manager, who intervented when necessary and produced the review report quickly.

We thank the 14 reviewers of our library, reviewed from November 5, 2009 to November 22, 2009. Reviews have been written by: Brandon Kohn, Christophe Henry, Fabio Fracassi, Gordon Woodhull, Joachim Faulhaber, Jonathan Franklin, Jose, Lucanus Simonson, Michael Caisse, Michael Fawcett, Paul Bristow, Phil Endecott, Thomas Klimpel, Tom Brinkman.

We also thank all people who discussed on the mailing lists (either at boost, or at osgeo) about Boost.Geometry, in preview stage, or in review stage, or after that.

Furthermore we are thankful to people supplying patches: Arnold Metselaar, Aleksey Tulinov, Christophe Henry

Finally I (Barend) would like to thank my former employer, Geodan. They allowed me to start a geographic library in 1995, which after a number of incarnations, redesigns, refactorings, previews, a review and even more refactorings have led to the now released Boost.Geometry. And with them I want to thank the team initially involved in developing the library, Valik Solorzano Barboza, Maarten Hilferink, Anne Blankert, and later Sjoerd Schreuder, Steven Fruijtier, Paul den Dulk, and Joris Sierman.

84. This section tries to recognize the contributions of all the different people that participated directly or indirectly to the design and development of this library.

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Finally, many thanks to the entire Boost community and [@http://lists.boost.org mailing list] for providing valuable comments on this library and great insights on the C++ programming language.

85. [h4 Boost Test Team]
Boost.Test 3.0 is being developed and maintained by Gennadiy Rozental and Raffi Enficiaud.

[h4 New documentation]
Raffi Enficiaud and Andrzej Krzemienski efforts were a driving force behind the Boost.Test documentation overhaul.

[h4 Second incarnation including the Unit Test Framework]
Beman Dawes and Ullrich Koethe started the library. Fernando Cacciola, Jeremy Siek, Beman Dawes, Ullrich Koethe, Dave Abrahams suggested numerous improvements during the Formal Review. Jeremy Siek was the review manager. Beman Dawes was a great help in both final testing and merging library with rest of the boost. Gennadiy Rozental was the developer and maintainer.

[h4 Original Test Library]

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87. This version of Spirit is a complete rewrite of the /classic/ Spirit many people have been contributing to (see below). But there are a couple of people who already managed to help significantly during this rewrite. We would like to express our special acknowledgement to (in no particular order):

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[*Joao Abecasis] for his early support and involvement in Spirit2 development and for disturbing my peace every once in a while for a couple of jokes.

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My, there's a lot in this list! And it's a continuing list. We add people to this list every time. We hope we did not forget anyone. If we missed someone you know who has helped in any way, please inform us.

Special thanks also to people who gave feedback and valuable comments, particularly members of Boost and Spirit mailing lists. This includes all those who participated in the review:

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L. Peter Deutsch
ghost@aladdin.com

****** UTF8 Validation logic (utf8_validation.hpp) ******
utf8_validation.hpp is adapted from code originally written by Bjoern Hoehrmann
<bjoern@hoehrmann.de>. See http://bjoern.hoehrmann.de/utf-8/decoder/dfa/ for
details.

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