

Title: Pythagoras's Oxen Revisited.
Authors: Albinus, Hans-Joachim
Source: Mathematical Intelligencer; Summer2003, Vol. 25 Issue 3, p41, 3p
Document Type: Article
Subject Terms: *PYTHAGOREAN proposition
MATHEMATICS in literature

3926 pdf
ALBINUS, H. J.
2003

Abstract: Discusses literary work based on the pythagoras theorem which proves that in a right-angled triangle the squares of the smaller sides sum up to the square of the hypotenuse. Sacrifice made by Pythagoras in discovering the theorem; Translations of pythagoras theorem-based literary work.

ISSN: 0343-6993

Accession Number: 10265702

Persistent link to this record: <http://search.ebscohost.com/login.aspx?direct=true&db=afh&AN=10265702&site=ehost-live>

Cut and Paste: Pythagoras's Oxen Revisited.

Database: Academic Search Elite

The link information above provides a persistent link to the article you've requested.

Persistent link to this record: Following the link above will bring you to the start of the article or citation.

Cut and Paste: To place article links in an external web document, simply copy and paste the HTML above, starting with "<A HREF"

If you have any problems or questions, contact Technical Support at <http://support.epnet.com/contact/askus.php> or call 800-758-5995.

This e-mail was generated by a user of EBSCOhost who gained access via the UTRECHT UNIV account. Neither EBSCO nor UTRECHT UNIV is responsible for the content of this e-mail.

Pythagoras's Oxen Revisited

It is said that when Pythagoras discovered his famous theorem, in a right-angled triangle the squares of the smaller sides sum up to the square of the hypotenuse, he sacrificed a hundred oxen to thank the gods.

There is a poem in German describing this sacrifice:

Vom Pythagoräischen Lehrsatz

Die Wahrheit, sie besteht in Ewigkeit,
Wenn erst die blöde Welt ihr Licht erkannt;
Der Lehrsatz nach Pythagoras benannt
Gilt heute, wie er galt zu seiner Zeit.

Ein Opfer hat Pythagoras geweiht
Den Götten, die den Lichtstrahl ihm gesandt
Es taten kund geschlachtet und verbrannt
Ein hundert Ochsen seine Dankbarkeit.

Die Ochsen, seit dem Tage, wenn sie wittern
Daß eine neue Wahrheit sich enthülle
Erheben ein unmenschliches Gebrülle;

Pythagoras erfüllt sie mit Entsetzen;
Und machtlos sich dem Licht zu widersetzen
Verschließen sie die Augen und erzittern.

In the German vernacular there is a double meaning to the word *Ochse*, which constitutes the poem's essential irony:

1. an ox
2. a blockhead.

Readers unfamiliar with German perhaps are aware of one of the two known English translations, one by the American biophysicist and biologist Max Delbrück (1906–1981),¹ the other by Robert Edouard Moritz (1868–1940), an American mathematician, who had studied in Göttingen: Delbrück's translation can be found in [7], p. 53; Moritz's, in his book *On Mathematics and Mathematicians*² ([6], p. 309).

Both translations are weak in various respects. Moritz's, for example, has lost the structure of rhyme in the first two verses, but it is in words and rhythm closer to the German text than Delbrück's. Of course, there is no adequate translation for *Ochsen* covering both senses.

It is often believed (see for example remarks by Olga Taussky ([7], p. 53) or Mark Kac ([5], p. 98–99) that the poem is by the German writer Heinrich Heine. But this is definitely not true.

The author of the sonnet is Adelbert von Chamisso (30.01.1781–21.08.1838), French by birth, whose family fled to Prussia during the French Revolution. There he grew up to become an officer in the Prussian army and later joined a circumnavigation of the globe as a natural scientist. After his return to Germany he worked at the botanical gardens in Berlin, where he became head of the herbarium. From his literary writings the most famous perhaps is the novel *Peter Schlemihls wundersame Geschichte* (published 1814) about the fate of a man who sells his shadow.

¹He was the son of the German historian Hans Delbrück. In 1969 Max Delbrück (together with Salvador Edward Luria and Alfred Day Hershey) received the Nobel Prize for Physiology and Medicine for his basic research in molecular biology and bacteriological genetics.

²Previous editions titled *Memorabilia Mathematica* or *the Philomath's Quotation-Book*.

Delbrück's translation

The truth: her hallmark is eternity
As soon as stupid world has seen her light
Pythagoras' theorem today is just as right
As when it first was shown to the fraternity.

The Gods who sent to him his ray of light
To them Pythagoras a token sacrificed:
One hundred oxen, roasted, cut, and sliced
Expressed his thanks to them, to their delight.

The oxen, since that day, when they surmise
That a new truth may be unveiling
Forthwith burst forth in fiendish railing.

Pythagoras forever gives them jitters—
Quite powerless to stem the thrust of such emitters
Of light, they tremble and they close their eyes.

Moritz's translation

Truth lasts throughout eternity,
When once the stupid world its light discerns:
The theorem, coupled with Pythagoras' name,
Holds true today, as't did in olden times.

A splendid sacrifice Pythagoras brought
The gods, who blessed him with this ray divine;
A great burnt offering of a hundred kine,
Proclaimed afar the sage's gratitude.

Now since that day, all cattle [blockheads] when they scent
New truth about to see the light of day,
In frightful bellows manifest their dismay;

Pythagoras fills them all with terror;
And powerless to shut out light by error,
In sheer despair they shut their eyes and tremble.

The sonnet *Vom Pythagoräischen Lehrsatz* was written in August 1835 and first published in 1836 ([3], p. 765). Cited above is the version found in a modern critical edition of Chamisso's complete works (for example [3], p. 536; there are identical editions by Carl Hanser Verlag, München, 1982, and Insel-Verlag, Leipzig, 1980); see [3], p. 679–682, for remarks concerning the punctuation and orthography,³ which was left as close as possible to the original text.

By the way, the source from which Chamisso was inspired to write the poem is believed to be an aphorism (no. 268, to be exact) by Ludwig Börne (1786–1837), who had already made use of the two meanings of *Ochsen* ([3], p. 765):

Als Pythagoras seinen bekannten Lehrsatz entdeckte, brachte er den Göttern eine Hekatombe dar. Seitdem zittern die Ochsen, sooft eine neue Wahrheit an das Licht kommt.

These sentences can be found in Börne's complete works⁴ (for example [2], p. 318); and again Moritz gives an English translation ([6], p. 308):

After Pythagoras discovered his fundamental theorem he sacrificed a hecatomb of oxen. Since that time all dunces tremble whenever a new truth is discovered.

Here he decided to use the second meaning of *Ochsen*.

Now, how has the belief arisen that the poem *Vom Pythagoräischen Lehrsatz* was written by Heinrich Heine

(1797–1856), as stated in the editor's note⁵ to Taussky's article ([7], p. 53) and in Mark Kac's (1914–1984) autobiography *Enigmas of Chance* ([5], p. 98–99), too? One hint could be Börne, who was at first a close friend of Heine and later, in the days of their exile in Paris, became his intimate enemy (the so-called Heine-Börne controversy). Could this be the reason that Taussky and Kac and others remembered Heine's name instead of Börne's?

Heine was more popular than Chamisso or Börne. And very likely they all remembered a passage in a text Heine wrote during a visit to the Frisian island of Norderney (see for example [4], p. 71), where he mentions Pythagoras and his hundred oxen in the context of the transmigration of souls (both human and animal) and possible funny incidents caused thereby:

Wer weiß! wer weiß! die Seele des Pythagoras ist vielleicht in einen armen Candidaten gefahren, der durch das Examen fällt, weil er den pythagoräischen Lehrsatz nicht beweisen konnte, während in seinen Herren Examinatoren die Seelen jener Ochsen wohnen, die einst Pythagoras, aus Freude über die Entdeckung seines Satzes, den ewigen Göttern geopfert hatte.

A translation may read as follows:

Who knows! Who knows! Perhaps Pythagoras's soul is now in a poor candidate who fails his examination because he is unable to prove the Pythagorean theorem, while in his examiners live the souls of those oxen which once, in the joy of the discovery of his theorem, Pythagoras had sacrificed to the eternal gods.

³A more modern spelling of the poem can be found in [1], p. 72, of which Moritz was aware.

⁴Be aware that some other editions of Börne's works use a different numbering of the aphorisms and miscellanea.

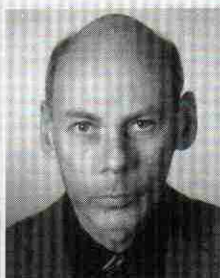
⁵The editor's question in *The Mathematical Intelligencer* for a hint to the poem's authorship or to a reference went unanswered at the time.

Thus, Pythagoras appears in the works of at least three prominent contemporary poets of the early 19th century: Ludwig Börne, Adelbert von Chamisso, and Heinrich Heine!

REFERENCES

- [1] Ahrens, W.: *Scherz und Ernst in der Mathematik. Geflügelte und ungeflügelte Worte*. Teubner, Leipzig, 1904.
- [2] Börne, Ludwig: *Sämtliche Schriften*, vol. 2. Melzer, Düsseldorf, 1964.
- [3] Chamisso, Adelbert von: *Sämtliche Werke in zwei Bänden*, vol. 1: *Gedichte—Dramatisches*. Wissenschaftliche Buchgesellschaft, Darmstadt, 1982.
- [4] Heine, Heinrich: *Säkularausgabe. Werke—Briefwechsel—Lebenszeugnisse*, vol. 5: *Reisebilder I 1824–1828*. Akademie, Berlin, 1970.
- [5] Kac, Mark: *Enigmas of Chance. An Autobiography*. Harper & Row, New York, 1985.
- [6] Moritz, Robert Edouard: *On Mathematics and Mathematicians*. Dover, New York, 1958.
- [7] Taussky, Olga: From Pythagoras' Theorem Via Sums of Squares to Celestial Mechanics. *The Mathematical Intelligencer*, 10 (1988), no. 1, p. 52–55.

AUTHOR



HANS-JOACHIM ALBINUS

Innenministerium Baden-Württemberg
Dorotheenstrasse 6
D-70173 Stuttgart
Germany
e-mail: hans-joachim.albinus@im.bwl.de

Hans-Joachim Albinus ought perhaps to have been named for his famous ancestor Decimus Clodius Albinus, claimant to the Roman imperial throne until he was killed in 197 A.D. by his rival Septimus Severus.

H.-J. Albinus did a master's degree in mathematics and geography at Ruhr-Universität Bochum, then worked in computing centres. Progressively doing more and more management and less and less mathematics, he became deputy head of electronic communication and management science in the provincial Innenministerium.

His interest in history of mathematics and computing survived. He also loves contemporary arts, fashion design, *haute cuisine*, and motorboats. He lives in Leonberg, one of the "Kepler towns" he invited us to in his Mathematical Tourist article, vol. 24, no. 3, 50–58.

Cauchy Product of Series

MAURICE MACHOVER

Abel, Mertens, Cauchy, Hardy
Proved some theorems very arty:
Sum up A_n , sum up B_n ,
Take the Cauchy product C_n .
If the first two sums converge,
Will the third to limit surge?

Let us these four men consult.
Abel proved the first result:
Let the C_n sum to C ,
 A_n to A , B_n to B ;
Abel showed accordingly
That A times B will equal C .

But we would like to sum C_n
Not in the "IF" but in the "THEN."

Along comes Mertens with a beaut
About convergence absolute:
If *absolutely* sums up one
(Each still converging to its sum),
Convergence of C_n comes free,
And A times B still equals C .

And furthermore great Cauchy says,
Two absolute sum-ups more pays,
For then the summing up to C
Will also go absolutely.

And last comes Hardy with his gift.
This time we have a little shift:
We still assume the first two sum,
But as to C_n , we are mum;
Instead, assume that bounds we ken
On nA_n and nB_n .
With these assumptions, Hardy says,
Convergence of the C_n stays;
It needn't go absolutely,
But A times B still equals C .

Department of Mathematics
St. John's University
Jamaica, NY 11439 USA
e-mail: cherokeezip@webtv.net

