

Reviving the Traditional Russian Orthography for the 21st Century

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Old Russian Orthography: what and why

- Classic and modern Russian literature used the “old” orthography
 - ▶ Pushkin, Turgenev, Dostoyevsky, Tolstoy, Chekhov, Nabokov, ...
- The orthography was reformed in 1918:
 - ▶ Replaced **ѣ**→е, **ѿ**→ѳ, **ї**→и, **ѵ**→и
 - ▶ 4 letters **ѢѢ**, **ѦѦ**, **Ѩ**, **ѪѪ** were physically removed from printing presses
 - ★ Often, **ѢѢ** was also removed by mistake
 - ▶ Replaced some prefixes, suffixes, and word endings
- Motivation for reform: “simplify the spelling”
- Old orthography continued to be used outside Russia

Old Russian orthography: example

Nabokov, *Storm* (1930)

Г Р О З А

На углу, подъ шатромъ цвѣтущей липы, обдало меня буйнымъ благоуханіемъ. Туманныя громады поднимались по ночному небу, и когда поглощенъ былъ послѣдній звѣздный просвѣтъ, слѣпой вѣтеръ, закрывъ лицо рукавами, низко пронесся вдоль опустѣвшей улицы. Въ тусклой темнотѣ, надъ желѣзнымъ ставнемъ парикмахерской, маятникомъ заходилъ висячій щитъ, золотое блюдо.

Вернувшись домой, я засталъ вѣтеръ уже въ комнатѣ: — онъ хлопнулъ оконной рамой и поспѣшно от-

Natural language orthography changes naturally...

Hobbes, *De cive* (1651)

I. **A**LL Authors agree not concerning the definition *of the Naturall Law*, who notwithstanding doe very often make use of this terme in their Writings. The Method therefore, wherein we begin from definitions, and exclusion of all equivocation, is only proper to them who leave no place for contrary Disputes; for the rest, if any man say, that somewhat is done against the Law of Nature, one proves it hence, because it was done against the generall Agreement of all the most wise, and learned Nations: But this declares not who shall be the judg of the wisdome and learning of all Nations:

Some letters are now added: *somewhat, judg*

Some letters are now removed: *doe, generall, wisdome*

...or when guided by a committee of experts

- A proposal for English, similar to the Russian spelling reform...
 - ▶ Omit the silent *e* in endings, replace vowels to “simplify” spelling
 - ★ breathe → breath, some → sum, made → maid, gate → gait
 - ▶ Replace the letters $c \rightarrow k/s$, $x \rightarrow ks$, $y \rightarrow i$
 - ★ played → plaid, hence → hens, xerox → kseroks
 - ▶ Physically remove the letters *C*, *X*, *Y* from all computer keyboards
 - ★ because they are a heritage of the *horrible old times*

What happens if you ban a few letters...

- One generation later, nobody remembers anything was ever different
- You lose effective access to your own culture
 - ▶ Cannot print adequate critical editions of classic literature
 - ▶ Nobody wants to read even 50-year old books
 - ▶ Converting each book to new spelling is hard for editors
- In Russia:
 - ▶ People born after ≈ 1950 are loath to read texts in the old orthography
 - ▶ Such texts are perceived to be *unquestionably* obsolete
 - ▶ No computers today fully support the old Russian orthography

Processing old Russian orthography in 2000

Main challenges:

- As of 2000, no 8-bit encodings contained the letters Ё, Θ, li, Vv
 - ▶ Unicode support was not widespread
- No keyboard layouts, no screen fonts, few vector fonts had them
 - ▶ L^AT_EX font support: nonstandard font encoding made by AMS
- No spelling checker support, no hyphenation, no OCR

Back to 2015: State of the art

- The letters Ъ, Ѣ, Ѡ, ѡ, Ѣ, ѣ, Ѡ, ѡ are present in most (vector) Cyrillic fonts
 - ▶ typesetting, printing supported through Unicode
 - ▶ L^AT_EX font support: OT2 font encoding only!
- Some spelling checker support (ispell, AbiWord, Open Office)
- Some language support for OCR
- No hyphenation support, no standard keyboard layouts

The oldrus-ispell project (1999-2003)

- <http://oldrus-ispell.sourceforge.net/koi8-extended.html>
- KOI8-C encoding ([IETF draft](#)), localization for the [links](#) browser
- A keyboard layout for X-Window and MS Windows 9x
- Bitmapped X-Window fonts (BDF), the `xcyr` package
 - ▶ Became part of [ucs-fonts](#) and [xfonts-cyrillic](#)
- `ispell` dictionary for old Russian orthography
- A PostScript typesetter using BDF as Type 3 fonts (Perl)
- A primitive converter, new \Leftrightarrow old orthography (Perl)

The KOI8-C encoding and screen fonts

Viewing Nabokov, *Despair* (1934) in Netscape using KOI8-C

росту не знаю, съ чего начать. Смѣшонъ пожилой человекъ, который бѣгомъ, съ прыгающими
томъ, догнать {5} послѣдній автобусъ, но боится вскочить на ходу, и виновато улыбаясь, еще
ужто не смѣю вскочить? Онъ воетъ, онъ ускоряетъ ходъ, онъ сейчасъ уйдетъ за уголъ, непо
его рассказа. Образъ довольно громоздкій. Я все еще бѣгу.

В мой быль ревельскій нѣмецъ, по образованію агрономъ, покойная мать -- чисто-русская. С
въ жаркіе лѣтніе дни она, бывало, въ сиреневыхъ шелкахъ, томная, съ вѣромъ въ рукѣ, пол
ь, кушала шоколадъ, и наливались сѣнокошнымъ вѣтромъ лиловые паруса спущенныхъ што
аго подданного, интернировали, -- я только-что поступилъ въ петербургскій университетъ, и
тырнадцатаго до середины девятнадцатая года я прочелъ тысяча восемнадцать книгъ, -- ве
нію я на три мѣсяца застрялъ въ Москвѣ и тамъ женился. Съ двадцатаго года проживалъ въ
такого года, уже переваливъ лично за тридцать пять -- --

упление: насчетъ матери я совралъ. По настоящему она была дочь мелкаго мѣщанина, -- про
кацавейкѣ.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|--|--|--|
| главных м | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 8A | 8B | 8C | 8D | 8E | 8F | | | | | | | | | | | | | |
| аг. Дѣло бы | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| лакомки. Не | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 9A | 9B | 9C | 9D | 9E | 9F | | | | | | | | | | | | | |
| ужать, мнѣ з | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| сно вести пл | AO | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | AA | AB | AC | AD | AE | AF | | | | | | | | | | | | | |
| ельзя. Спок | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| овара изобр | BO | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | BA | BB | BC | BD | BE | BF | | | | | | | | | | | | | |
| и на наше пр | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| таксомотор | CO | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | CA | CB | CC | CD | CE | CF | | | | | | | | | | | | | |
| го, -- но вѣд | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| не засалы к | DO | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | DA | DB | DC | DD | DE | DF | | | | | | | | | | | | | |
| мѣ сообщить | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| ь горой, пох | EO | E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | EA | EB | EC | ED | EE | EF | | | | | | | | | | | | | |
| и, то рисуя н | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |
| старшой н | FO | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | FA | FB | FC | FD | FE | FF | | | | | | | | | | | | | |
| | ѐ | ђ | ѓ | ѕ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | ѵ | | | |

Working with the oldrus-ispell dictionary

Proofreading Melgunov's *Red Terror in Russia* (1924)

The screenshot shows a text editor window with a menu bar (File, Edit, Search, Preferences, Shell, Macro, Windows) and a status bar (Shell Command in Progress -- Press Ctrl+. to Cancel). The main text area contains a passage from Melgunov's *Red Terror in Russia* (1924). The text is in Old Russian orthography. A word "без" (bez) is highlighted, and a dictionary window (ispell) is open, showing the word "без" and its variants: 0: бей, 1: безе, 2: безо, 3: безъ. The text in the editor is as follows:

"Еженедѣльникъ Ч. К." *(6) никогда ничего больше {39} не было опубликовано. А между тѣм мы знаем, что людей в эти дни в Москвѣ по общимъ свѣдѣніямъ было разстрѣлено больше 300 *(7).
Тѣ, которые сидѣли в эти поистинѣ мучительные дни в Бутырской тюрьмѣ, когда были арестованы тысячи людей из самых разнообразных общественных слоев, никогда не забудут своих душевных переживаній. было время террора".
присутство
автомобили
каждом авт
"с вещами"
связывать
сидѣл в эт
кошмары. В
"В пам

The dictionary window (ispell) shows the word "без" and its variants: 0: бей, 1: безе, 2: безо, 3: безъ. The text in the editor is as follows:

Main linguistic challenge: recover lost information

To convert texts to the old Russian orthography, we:

- disambiguate word pairs that became homographs...
 - ▶ самого - самага, синее - синѣе, осель - осель
- ...and also some homophones that became homonyms
 - ▶ есть - ѣсть, нежить - нѣжить, некогда - нѣкогда
- restore traditional word endings: requires parsing the grammar
 - ▶ *они, туманные звезды → онѣ, туманныя звѣзды
- restore old letters in word stems, prefixes, and suffixes
 - ▶ ѿедоръ (**The**odor), орѿографія (**orth**ography), мѿро (**myrr**he)
 - ▶ *рассви́репел → разсви́ръпѣлъ, *нежнейшего → нѣжнѣйшаго

Disambiguation tasks

- identifying parts of speech
 - ▶ *синее → синее (blue), синѣе (more blue)
 - ▶ *тем → темъ (of themes), тъмъ (by that)
- identifying grammatical forms (number, gender, case, tense)
 - ▶ *в море → въ море (into the sea), въ морѣ (within the sea)
 - ▶ *есть → есть (it is), ѣсть (to eat)
- for some words, identifying **semantic content** is required
 - ▶ *мир → миръ (peace), міръ (world)
 - ▶ *лечу → лечу (I fly), лѣчу (I heal)
- pronunciation details (stress, е/ѣ) sometimes help

Converter for the old Russian orthography

- Dictionary-based, with some simple heuristics
- No full disambiguation, results need proofreading

Tyutchev, *Silentium* (1830)

Молчи, скрывайся и таи
И чувства и мечты свои -
Пускай в душевной глубине
Встают и заходят оне
Безмолвно, как звезды в ночи,-
Любуйся ими - и молчи.

Молчи, скрывайся и таи
И чувства и мечты свои -
Пускай **въ** душевной глубин**ѣ**
Встают**ъ** и заходят**ъ** он**ѣ**
Безмолвно, как**ъ** зв**ѣ**зды **въ** ночи,-
Любуйся ими - и молчи.

Outlook: the future of the old Russian orthography

- Custom keyboard layouts will become standard in OSes?
- Hyphenation dictionaries for \LaTeX and other systems?
- Spelling dictionaries and grammar checking
- Fully disambiguating converter between new and old orthography