

Making a Markov Chain Poem Generator in Python



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Feb 17, 2018 · 2 min read

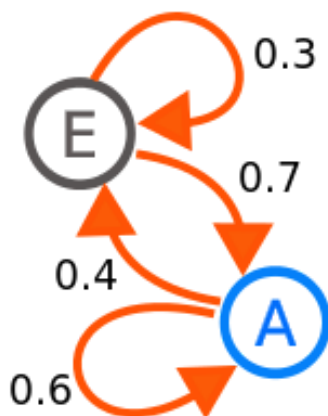
At school, my English class is split into two semesters, the first of which is an introduction to poetry. I have never been much of a fan of poetry, since I never felt like I could understand it. After enduring a semester of classes in which we extract meaning from every poem we read, I don't think I ever extracted meaning from any of them. This is not to say poetry is meaningless in general, I think it is a beautiful art form that should be appreciated and preserved, just not one that I do justice to. Nevertheless, I started thinking: these poems are so meaningless to me that they seem like a sequence of words meant to seem profound to the point where a computer could be programmed to write poems like this based on poems that are put into it. So why don't I make one?

So I did.

. . .

How the Program Essentially Works

Markov chains, in the way that I'm using them, are a way of generating language by choosing the next word based on the previous one and probabilities of what words are most likely to succeed it.



This is an example of a Markov chain with two states, along with the probabilities of the Markov process changing from state to state. Image Courtesy Wikipedia.

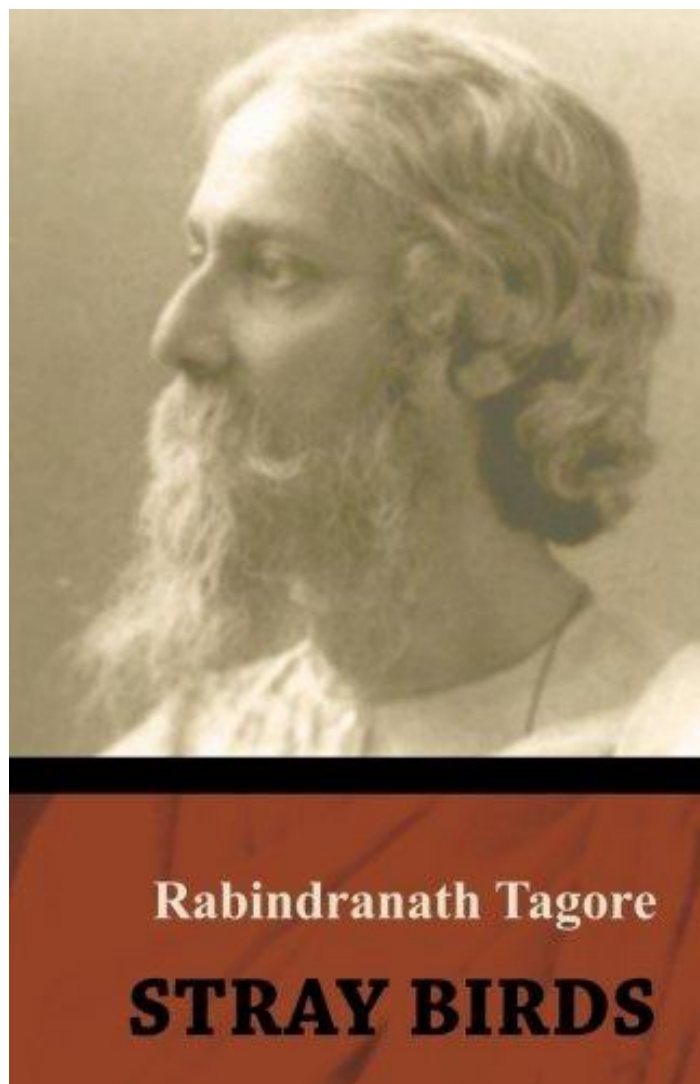
I find out these probabilities by putting in a text file of the poems and processing them into an array of all of its words. Then, I run a loop that creates a Python dictionary in which each key is a word and its corresponding value is an array of every word that has immediately followed it.

The Markov poem is generated by picking a random first word and picking every following word from the dictionary values of the previous one.

. . .

Some Minor Story Details

In an attempt to bore myself a little less, I chose a poet who I can genuinely admire, Rabindranath Tagore. He was the first Asian Nobel Laureate and a hero in the world of Bengali literature. My dad is a big fan of his work (especially since he appreciates poetry far more than I do), so I thought his work would be a nice place to start.



I found out about a book of short poems by Tagore called *Stray Birds*, and decided to use it, so I downloaded the text of the book from Project Gutenberg. I process the .txt file a little bit so that only the poems remain, name it `stray_birds.txt` and feed it into the program.

. . .

**And With That, I Leave You The
Source Code**

```
1  # Mehrab Jamee
2  # Markov Chain Poetry
3  # Generated from Stray Birds by Rabindranath Tagore
4
5  import random
6  import sys
7
8  poems = open("stray_birds.txt", "r").read()
9  poems = ''.join([i for i in poems if not i.isdigit()]).replace("\n", " ")
10 # This process the list of poems. Double line breaks separate words.
11 # Splitting along spaces creates a list of all words.
12
13 index = 1
14 chain = {}
15 count = 100 # Desired word count of output
16
17 # This loop creates a dictionary called "chain". Each key is a word, and
18 # the value is a list of words that immediately followed it.
19 for word in poems.split():
20     key = poems[index - 1]
21     if key in chain:
22         chain[key].append(word)
23     else:
24         chain[key] = [word]
25     index += 1
26
27 word1 = random.choice(list(chain.keys())) #random first word
28 message = word1.capitalize()
29
30 # Picks the next word over and over until word count achieved
31 while len(message.split(' ')) < count:
32     word2 = random.choice(chain[word1])
33     word1 = word2
34     message += ' ' + word2
35
36 # creates new file with output and prints it to the terminal
37 with open("output.txt", "w") as file:
38     file.write(message)
```

```
39 output = open("output.txt","r")
40 print(output.read())
41
42
43
44
45
46
```

markov_poem.py hosted with ❤ by GitHub

[view raw](#)

```
1 1
2 Stray birds of summer come to my window to sing and fly a
3 And yellow leaves of autumn, which have no songs, flutter
4 fall there with a sigh.
5
6 2
7 O troupe of little vagrants of the world, leave your foot
8 in my words.
9
10 3
11 The world puts off its mask of vastness to its lover.
12 It becomes small as one song, as one kiss of the eternal.
13
14 4
15 It is the tears of the earth that keep her smiles in bloo
16
17 5
18 The mighty desert is burning for the love of a blade of g
19 shakes her head and laughs and flies away.
20
21 6
22 If you shed tears when you miss the sun, you also miss th
23
24 7
25 The sands in your way beg for your song and your movement
26 dancing water. Will you carry the burden of their lamene
27
28 8
```

```
29 Her wistful face haunts my dreams like the rain at night.
30
31 9
32 Once we dreamt that we were strangers.
33 We wake up to find that we were dear to each other.
34
35 10
36 Sorrow is hushed into peace in my heart like the evening
37 the silent trees.
38
39 11
40 Some unseen fingers, like idle breeze, are playing upon m
41 the music of the ripples.
42
43 12
44 "What language is thine, O sea?"
45
46     "The language of eternal question."
47
48 "What language is thy answer, O sky?"
49
50     "The language of eternal silence."
51
52 13
53 Listen, my heart, to the whispers of the world with which
54 makes love to you.
55
56 14
57 The mystery of creation is like the darkness of night--it
58 great. Delusions of knowledge are like the fog of the mo
59
60 15
61 Do not seat your love upon a precipice because it is high
62
63 16
64 I sit at my window this morning where the world like a pa
65 stops for a moment, nods to me and goes.
66
-- --
```

```
67 17
68 These little thoughts are the rustle of leaves; they have
69 whisper of joy in my mind.
70
71 18
72 What you are you do not see, what you see is your shadow.
73
74 19
75 My wishes are fools, they shout across thy songs, my Mast
76 Let me but listen.
77
78 20
79 I cannot choose the best.
80 The best chooses me.
81
82 21
83 They throw their shadows before them who carry their lant
84 their back.
85
86 22
87 That I exist is a perpetual surprise which is life.
88
89 23
90 "We, the rustling leaves, have a voice that answers the s
91 but who are you so silent?"
92
93 "I am a mere flower."
94
95 24
96 Rest belongs to the work as the eyelids to the eyes.
97
98 25
99 Man is a born child, his power is the power of growth.
100
101 26
102 God expects answers for the flowers he sends us, not for
103 and the earth.
104
105 27
```

```
106 The light that plays, like a naked child, among the green
107 happily knows not that man can lie.
108
109 28
110 O Beauty, find thyself in love, not in the flattery of th
111 mirror.
112
113 29
114 My heart beats her waves at the shore of the world and wr
115 upon it her signature in tears with the words, "I love th
116
117 30
118 "Moon, for what do you wait?"
119
120 "To salute the sun for whom I must make way."
121
122 31
123 The trees come up to my window like the yearning voice of
124 dumb earth.
125
126 32
127 His own mornings are new surprises to God.
128
129 33
130 Life finds its wealth by the claims of the world, and its
131 by the claims of love.
132
133 34
134 The dry river-bed finds no thanks for its past.
135
136 35
137 The bird wishes it were a cloud. The cloud wishes it wer
138 bird.
139
140 36
141 The waterfall sings, "I find my song, when I find my free
142
143 37
```



```
144 I cannot tell why this heart languishes in silence.
145 It is for small needs it never asks, or knows or remember
146
147 38
148 Woman, when you move about in your household service your
149 sing like a hill stream among its pebbles.
150
151 39
152 The sun goes to cross the Western sea, leaving its last
153 salutation to the East.
154
155 40
156 Do not blame your food because you have no appetite.
157
158 41
159 The trees, like the longings of the earth, stand a-tiptoe
160 at the heaven.
161
162 42
163 You smiled and talked to me of nothing and I felt that fo
164 had been waiting long.
165
166 43
167 The fish in the water is silent, the animal on the earth
168 noisy, the bird in the air is singing,
169 But Man has in him the silence of the sea, the noise of t
170 and the music of the air.
171
172 44
173 The world rushes on over the strings of the lingering hea
174 making the music of sadness.
175
176 45
177 He has made his weapons his gods. When his weapons win h
178 defeated himself.
179
180 46
181 God finds himself by creating.
```

```
182
183 47
184 Shadow, with her veil drawn, follows Light in secret meek
185 with her silent steps of love.
186
187 48
188 The stars are not afraid to appear like fireflies.
189
190 49
191 I thank thee that I am none of the wheels of power but I
192 with the living creatures that are crushed by it.
193
194 50
195 The mind, sharp but not broad, sticks at every point but
196 move.
197
198 51
199 Your idol is shattered in the dust to prove that God's du
200 greater than your idol.
201
202 52
203 Man does not reveal himself in his history, he struggles
204 through it.
205
206 53
207 While the glass lamp rebukes the earthen for calling it c
208 the moon rises, and the glass lamp, with a bland smile, c
209 her, "My dear, dear sister."
210
211 54
212 Like the meeting of the seagulls and the waves we meet an
213 near. The seagulls fly off, the waves roll away and we d
214
215 55
216 My day is done, and I am like a boat drawn on the beach,
217 listening to the dance-music of the tide in the evening.
218
219 56
220 Life is given to us. we earn it by giving it.
```

```
--- -- given to us, we learn to be, giving ---  
221  
222 57  
223 We come nearest to the great when we are great in humilit  
224  
225 58  
226 The sparrow is sorry for the peacock at the burden of its  
227  
228 59  
229 Never be afraid of the moments--thus sings the voice of t  
230 everlasting.  
231  
232 60  
233 The hurricane seeks the shortest road by the no-road, and  
234 suddenly ends its search in the Nowhere.  
235  
236 61  
237 Take my wine in my own cup, friend.  
238 It loses its wreath of foam when poured into that of othe  
239  
240 62  
241 The Perfect decks itself in beauty for the love of the Im  
242  
243 63  
244 God says to man, "I heal you therefore I hurt, love you t  
245 punish."  
246  
247 64  
248 Thank the flame for its light, but do not forget the lamp  
249 standing in the shade with constancy of patience.  
250  
251 65  
252 Tiny grass, your steps are small, but you possess the ear  
253 your tread.  
254  
255 66  
256 The infant flower opens its bud and cries, "Dear World, p  
257 not fade."  
258
```

```
259 67
260 God grows weary of great kingdoms, but never of little fl
261
262 68
263 Wrong cannot afford defeat but Right can.
264
265 69
266 "I give my whole water in joy," sings the waterfall, "tho
267 little of it is enough for the thirsty."
268
269 70
270 Where is the fountain that throws up these flowers in a c
271 outbreak of ecstasy?
272
273 71
274 The woodcutter's axe begged for its handle from the tree.
275 The tree gave it.
276
277 72
278 In my solitude of heart I feel the sigh of this widowed e
279 veiled with mist and rain.
280
281 73
282 Chastity is a wealth that comes from abundance of love.
283
284 74
285 The mist, like love, plays upon the heart of the hills an
286 out surprises of beauty.
287
288 75
289 We read the world wrong and say that it deceives us.
290
291 76
292 The poet wind is out over the sea and the forest to seek
293 voice.
294
295 77
296 Every child comes with the message that God is not yet
```

```
297 discouraged of man.
298
299 78
300 The grass seeks her crowd in the earth.
301 The tree seeks his solitude of the sky.
302
303 79
304 Man barricades against himself.
305
306 80
307 Your voice, my friend, wanders in my heart, like the muff
308 sound of the sea among these listening pines.
309
310 81
311 What is this unseen flame of darkness whose sparks are th
312
313 82
314 Let life be beautiful like summer flowers and death like
315 leaves.
316
317 83
318 He who wants to do good knocks at the gate; he who loves
319 the gate open.
320
321 84
322 In death the many becomes one; in life the one becomes ma
323 Religion will be one when God is dead.
324
325 85
326 The artist is the lover of Nature, therefore he is her sl
327 her master.
328
329 86
330 "How far are you from me, O Fruit?"
331
332 "I am hidden in your heart, O Flower."
333
334 87
335 This longing is for the one who is felt in the dark but
```

```
335 this longing is for the one who is lost in the dark, but
336 in the day.
337
338 88
339 "You are the big drop of dew under the lotus leaf, I am t
340 smaller one on its upper side," said the dewdrop to the l
341
342 89
343 The scabbard is content to be dull when it protects the k
344 of the sword.
345
346 90
347 In darkness the One appears as uniform; in the light the
348 appears as manifold.
349
350 91
351 The great earth makes herself hospitable with the help of
352 grass.
353
354 92
355 The birth and death of the leaves are the rapid whirls of
356 eddy whose wider circles move slowly among stars.
357
358 93
359     Power said to the world, "You are mine.
360     The world kept it prisoner on her throne.
361     Love said to the world, "I am thine."
362     The world gave it the freedom of her house.
363
364 94
365 The mist is like the earth's desire. It hides the sun fo
366 she cries.
367
368 95
369 Be still, my heart, these great trees are prayers.
370
371 96
372 The noise of the moment scoffs at the music of the Eterna
373
```

```
374 97
375 I think of other ages that floated upon the stream of lif
376 love and death and are forgotten, and I feel the freedom
377 passing away.
378
379 98
380 The sadness of my soul is her bride's veil.
381 It waits to be lifted in the night.
382
383 99
384 Death's stamp gives value to the coin of life; making it
385 to buy with life what is truly precious.
386
387 100
388 The cloud stood humbly in a corner of the sky.
389 The morning crowned it with splendour.
390
391 101
392 The dust receives insult and in return offers her flowers
393
394 102
395 Do not linger to gather flowers to keep them, but walk on
396 flowers will keep themselves blooming all your way.
397
398 103
399 Roots are the branches down in the earth.
400 Branches are roots in the air.
401
402 104
403 The music of the far-away summer flutters around the Autu
404 seeking its former nest.
405
406 105
407 Do not insult your friend by lending him merits from your
408 pocket.
409
410 106
411 The touch of the nameless days clings to my heart like mo
```

```
412 round the old tree.
413
414 107
415 The echo mocks her origin to prove she is the original.
416
417 108
418 God is ashamed when the prosperous boasts of His special
419
420 109
421 I cast my own shadow upon my path, because I have a lamp
422 not been lighted.
423
424 110
425 Man goes into the noisy crowd to drown his own clamour of
426 silence.
427
428 111
429 That which ends in exhaustion is death, but the perfect e
430 in the endless.
431
432 112
433 The sun has his simple robe of light. The clouds are dec
434 gorgeousness.
435
436 113
437 The hills are like shouts of children who raise their arm
438 trying to catch stars.
439
440 114
441 The road is lonely in its crowd for it is not loved.
442
443 115
444 The power that boasts of its mischiefs is laughed at by t
445 yellow leaves that fall, and clouds that pass by.
446
447 116
448 The earth hums to me to-day in the sun, like a woman at h
449 spinng, some ballad of the ancient time in a forgotten to
450
```



```
450
451 117
452 The grass-blade is worth of the great world where it grow
453
454 118
455 Dream is a wife who must talk.
456 Sleep is a husband who silently suffers.
457
458 119
459 The night kisses the fading day whispering to his ear, "I
460 death, your mother. I am to give you fresh birth."
461
462 120
463 I feel, thy beauty, dark night, like that of the loved wo
464 she has put out the lamp.
465
466 121
467 I carry in my world that flourishes the worlds that have
468
469 122
470 Dear friend, I feel the silence of your great thoughts of
471 deepening eventide on this beach when I listen to these w
472
473 123
474 The bird thinks it is an act of kindness to give the fish
475 in the air.
476
477 124
478 "In the moon thou sendest thy love letters to me," said t
479 to the sun.
480
481 "I leave my answers in tears upon the grass."
482
483 125
484 The Great is a born child; when he dies he gives his grea
485 childhood to the world.
486
487 126
488 Not hammerstrokes, but dance of the water sings the pebb
```

```
489 perfection.
490
491 127
492 Bees sip honey from flowers and hum their thanks when the
493 The gaudy butterfly is sure that the flowers owe thanks t
494
495 128
496 To be outspoken is easy when you do not wait to speak the
497 complete truth.
498
499 129
500 Asks the Possible to the Impossible, "Where is your dwell
501 place?"
502
503 "In the dreams of the impotent," comes the answer.
504
505 130
506 If you shut your door to all errors truth will be shut ou
507
508 131
509 I hear some rustle of things behind my sadness of heart,-
510 cannot see them.
511
512 132
513 Leisure in its activity is work.
514 The stillness of the sea stirs in waves.
515
516 133
517 The leaf becomes flower when it loves.
518 The flower becomes fruit when it worships.
519
520 134
521 The roots below the earth claim no rewards for making the
522 branches fruitful.
523
524 135
525 This rainy evening the wind is restless.
526 I look at the swaying branches and ponder over the greatn
```

```
527 all things.
528
529 136
530 Storm of midnight, like a giant child awakened in the unt
531 dark, has begun to play and shout.
532
533 137
534 Thou raisest thy waves vainly to follow thy lover. O sea
535 lonely bride of the storm.
536
537 138
538 "I am ashamed of my emptiness," said the Word to the Work
539 "I know how poor I am when I see you," said the Work to t
540
541 139
542 Time is the wealth of change, but the clock in its parody
543 it mere change and no wealth.
544
545 140
546 Truth in her dress finds facts too tight.
547 In fiction she moves with ease.
548
549 141
550 When I travelled to here and to there, I was tired of the
551 Road, but now when thou leadest me to everywhere I am wed
552 thee in love.
553
554 142
555 Let me think that there is one among those stars that gui
556 life through the dark unknown.
557
558 143
559 Woman, with the grace of your fingers you touched my thin
560 order came out like music.
561
562 144
563 One sad voice has its nest among the ruins of the years.
564 It sings to me in the night,--"I loved you."
565
```

```
565
566 145
567 The flaming fire warns me off by its own glow.
568 Save me from the dying embers hidden under ashes.
569
570 146
571 I have my stars in the sky,
572 But oh for my little lamp unlit in my house.
573
574 147
575 The dust of the dead words clings to thee.
576 Wash thy soul with silence.
577
578 148
579 Gaps are left in life through which comes the sad music o
580
581 149
582 The world has opened its heart of light in the morning.
583 Come out, my heart, with thy love to meet it.
584
585 150
586 My thoughts shimmer with these shimmering leaves and my h
587 sings with the touch of this sunlight; my life is glad to
588 floating with all things into the blue of space, into the
589 time.
590
591 151
592 God's great power is in the gentle breeze, not in the sto
593
594 152
595 This is a dream in which things are all loose and they op
596 I shall find them gathered in thee when I awake and shall
597 free.
598
599 153
600 "Who is there to take up my duties?" asked the setting s
601
602 "I shall do what I can, my Master," said the earthen lamp
603
```

```
604 154
605 By plucking her petals you do not gather the beauty of th
606 flower.
607
608 155
609 Silence will carry your voice like the nest that holds th
610 sleeping birds.
611
612 156
613 The Great walks with the Small without fear.
614 The Middling keeps aloof.
615
616 157
617 The night opens the flowers in secret and allows the day
618 thanks.
619
620 158
621 Power takes as ingratitude the writhings of its victims.
622
623 159
624 When we rejoice in our fulness, then we can part with our
625 with joy.
626
627 160
628 The raindrops kissed the earth and whispered,--"We are th
629 homesick children, mother, come back to thee from the hea
630
631 161
632 The cobweb pretends to catch dew-drops and catches flies.
633
634 162
635 Love! when you come with the burning lamp of pain in you
636 I can see your face and know you as bliss.
637
638 163
639 "The learned say that your lights will one day be no more
640 the firefly to the stars.
641
```

```
642 The stars made no answer.
643
644 164
645 In the dusk of the evening the bird of some early dawn co
646 the nest of my silence.
647
648 165
649 Thoughts pass in my mind like flocks of ducks in the sky.
650 I hear the voice of their wings.
651
652 166
653 The canal loves to think that rivers exist solely to supp
654 with water.
655
656 167
657 The world has kissed my soul with its pain, asking for it
658 in songs.
659
660 168
661 That which oppresses me, is it my soul trying to come out
662 open, or the soul of the world knocking at my heart for i
663 entrance?
664
665 169
666 Thought feeds itself with its own words and grows.
667
668 170
669 I have dipped the vessel of my heart into this silent hou
670 has filled with love.
671
672 171
673 Either you have work or you have not.
674 When you have to say, "Let us do something," then begins
675 mischief.
676
677 172
678 The sunflower blushed to own the nameless flower as her k
679 The sun rose and smiled on it, saying, "Are you well, my
680 dear one?"
```

```
680   uarlingr
681
682   173
683   "Who drives me forward like fate?"
684
685   "The Myself striding on my back."
686
687   174
688   The clouds fill the watercups of the river, hiding themse
689   the distant hills.
690
691   175
692   I spill water from my water jar as I walk on my way,
693   Very little remains for my home.
694
695   176
696   The water in a vessel is sparkling; the water in the sea
697   The small truth has words that are clear; the great truth
698   great silence.
699
700   177
701   Your smile was the flowers of your own fields, your talk
702   rustle of your own mountain pines, but your heart was the
703   that we all know.
704
705   178
706   It is the little things that I leave behind for my loved
707   great things are for everyone.
708
709   179
710   Woman, thou hast encircled the world's heart with the dep
711   thy tears as the sea has the earth.
712
713   180
714   The sunshine greets me with a smile. The rain, his sad s
715   talks to my heart.
716
717   181
718   My flower of the day dropped its petals forgotten.
```

```
719 In the evening it ripens into a golden fruit of memory.  
720  
721 182  
722 I am like the road in the night listening to the footfall  
723 memories in silence.  
724  
725 183  
726 The evening sky to me is like a window, and a lighted lam  
727 waiting behind it.  
728  
729 184  
730 He who is too busy doing good finds no time to be good.  
731  
732 185  
733 I am the autumn cloud, empty of rain, see my fulness in t  
734 of ripened rice.  
735  
736 186  
737 They hated and killed and men praised them.  
738 But God in shame hastens to hide its memory under the gre  
739 grass.  
740  
741 187  
742 Toes are the fingers that have forsaken their past.  
743  
744 188  
745 Darkness travels towards light, but blindness towards dea  
746  
747 189  
748 The pet dog suspects the universe for scheming to take it  
749  
750 190  
751 Sit still my heart, do not raise your dust.  
752 Let the world find its way to you.  
753  
754 191  
755 The bow whispers to the arrow before it speeds forth--"Yo  
756 freedom is mine."
```



```
757
758 192
759 Woman, in your laughter you have the music of the fountai
760 life.
761
762 193
763 A mind all logic is like a knife all blade.
764 It makes the hand bleed that uses it.
765
766 194
767 God loves man's lamp lights better than his own great sta
768
769 195
770 This world is the world of wild storms kept tame with the
771 of beauty.
772
773 196
774 "My heart is like the golden casket of thy kiss," said th
775 cloud to the sun.
776
777 197
778 By touching you may kill, by keeping away you may possess
779
780 198
781 The cricket's chirp and the patter of rain come to me thr
782 dark, like the rustle of dreams from my past youth.
```