

THE RIEMANN LETTERS AT THE PRUSSIAN CULTURAL ARCHIVES

Attached are summaries and/or translations of some 29 letters of Bernhard Riemann to his family written in the period from 1840 to 1864. There are summaries of 12 letters given and either the complete text or extracts from another 17 letters. There is -- to my knowledge -- only one of the letters that has ever appeared before in print. This is the June 26, 1854 letter that appears here and also (in German) in the (Dedekind) biography of Riemann in back of the Weber edition of the collected works. Otherwise, both the letters and their translations appear here for the first time.

The production of these translations went through three stages. First, a gentleman familiar with reading handwritten Gothic German script read the letter manuscripts into a tape recorder. In doing so, he, the reader, summarized some letters from the early period of Riemann's career. Second, the tape recording of the manuscripts was transcribed. That is, all actual extracts from the Riemann letters were set down onto paper in the German (with Roman script, of course); the reader's summaries were translated into English. Lastly, the Riemann text was translated. The translation of the reader summaries was done by Robert Gallagher and Michael Weissbach. The transcription was done by Michael Weissbach.

The translation of the Riemann text was done by Robert  
Gallagher and David Cherry.

In translating the letters, a new page was begun with each  
letter. This was done so as to preserve the order in which  
they were read without making it difficult to re-arrange  
them into one historical sequence. As will be seen, the  
letters are in two groups going by the dates and this  
perhaps indicates that they came from two different sources.  
The last several letters (comprising the second group) are all  
to his brother Wilhelm.

Bob Gallagher

6/30/81

NOTE: The Riemann text is always indented.

Letters of Bernhard Riemann at the Prussian Cultural Archives

(Preussischer Kultur Besitz) of the Prussian State Library

These are excerpts pertaining to his scientific work, etc. from when he was 14 years old and attending school at the Hannover Gymnasium through his entrance into Goettingen University and up to his professorship there.

The letters are mostly addressed to brothers and sisters and other relatives and so contain personal matters. Such information of a personal nature is only mentioned in so far as it is useful in understanding Riemann and his work.

A letter dated May 3, 1840 to his father.

In this letter Riemann describes the <sup>weekly</sup> school curriculum of his fourth-year class (Kleintertia) to his father. He notes the following classes:

Latin	six lessons
German	four lessons
Greek	six lessons
Arithmetic (Rechnen)	four lessons
Geography	two lessons
History	two lessons
Natural history	two lessons
Religion	four lessons

Riemann complains in the letter that he has no mathematics or French and that he has too little instruction in history compared to arithmetic (Rechnen). One can see from the letter that Riemann -- already as a youth -- had no intension of being a specialist but from the beginning sought to acquire wide-ranging knowledge. One can also see from the letters that Riemann had a close relationship with his father. Because

of his family's financial situation, Riemann could travel home from Hannover to Quickborn only at major holidays. Consequently, Riemann could communicate his sorrows and concerns to his parents only via letters.

Letter of January 23, 1841 to his father.

In this letter Riemann mentions, among other things, the history of Braunschweig, which is discussed in school. He reports that in the latin exercises he got a perfect score several times. So, as a result, he received the grade vera bene.

Letter of February 20, 1841.

In this letter he complains that the preparations for the examinations left him with little time. However, on February 13, he had managed to attend a concert of Haydn's Creation with the Kessner family.

Letter of April 17, 1841 to his father.

Riemann gives the results of his Easter mid-term report from the school on his progress:

Conduct	first B (eins B)
Diligence	first B (eins B)
Attentiveness	first B (eins B)
Religion	second B (zwei B)
History	first (eins)
Geography	third (drei)
Natural history	third (drei)
Mathematics	second B (zwei B)
Recitation	second (zwei)
French	first (eins)
German	second (zwei)
Latin - Exposition	first B (eins B)
- Composition	second B (zwei B)
Greek - Exposition	second B (zwei B)
- Composition	second B (zwei B)

Once Riemann was praised in the Class Book (Klassenbuch) as very diligent.

In the following letters to his father, Riemann reports on the precise results of his intermediate examinations. He notes the exact grades he received and the mistakes he made in the examinations in the various subjects. Although he doesn't always succeed, he tries to get high grades in all subjects.

Letter of April 2, 1842 to his mother.

In this letter, he writes that he arrived in Lueneberg on April 1. There he then attends the Johanneum and enters the second class (secunda). He had passed the entrance examination to the satisfaction of the teachers.

From the letters that follow it is obvious that he feels <sup>(more)</sup> at home at the school in Lueneberg. Obviously he had a better relationship with the teachers there. There he learns to play the piano. He reports that together with another student he received the grade for the best essay in German composition.

Letter of August 5, 1841 *o*

He writes that he is the best student in his class in history and mathematics. In Greek his class read the Voyage of the Argonauts (der Argonautenzug) and in Latin Caesar's Gaellic Wars.

Letter of August 20, 1843 to his father.

In this letter he reports that the regional director (Landschaftsdirektor) granted him a stipend for his achievements in school.

In another letter of February 1, 1845, he describes to his father his translation of Socrates' Apology for which he received the grade <sup>(ZWEI)</sup> second <sub>A</sub> from Schmalfuss, the director of the school at Lueneberg. He also writes about a fellow student named Stisser\* who received the grade excellent (vorzueglich) in mathematics in 1845 (one year *before*

\* Mentioned in the letter of November 29, 1847 also.



Riemann took his graduation examinations (Maturitaetspruefung).  
He reports that director Schmalfuss had said in a teachers' conference that Stisser was the best mathematician that the school had examined for a long time, but that Riemann could even do much better.

Letter of March 8, 1845.

In this letter he mentions that he felt that his translations of Latin and his GERman compositions came out very well. And he hoped that he would get the grade first (eins) in the graduation examinations (Maturitaetspruefung) next Easter (1846).

Letter of April 30, 1845.

He writes to his father that he feels more and more attracted to mathematics. He also reports that SCHmalfuss advised him that he should study mathematics. He writes that he wants to be enrolled at the University of Goettingen for the subject of theology, but then continues:

but I must truly decide for myself what I shall do, since otherwise I cannot bring anything sound to a subject.

Letter of February 20, 1846 to his father.

HE writes to his father that this week the graduation examinations (Maturitaetspruefung) begin. He gives the schedule:

Monday Latin Essay (Lateinischer Aufsatz)

Tuesday Greek

Wednesday German Essay (Deutscher Aufsatz)

Thursday Hebrew

Friday French

Saturday Mathematics

Riemann concludes with the words:

With God's help I can give you good news in the middle of next week.

The next letter is dated November 5, 1846 and reads as follows:

About the lectures that I'll attend I am still not entirely clear, in part because several of those that I would like to attend occur simultaneously and for the others the time when they will be given is not yet exactly determined, so one still cannot draw up a final schedule. I have enrolled in six lectures ~~for a quarter~~ for a total cost of three Louis-dur and three Thaler. Namely, Cultural

History of Greece and Rome, ~~Introduction~~ by Hermann, Introduction

to the Study of Theology by Ehrenfeuchter, Recent Church

History by ~~Lotze~~ <sup>Reincke</sup>, General Physiology by Lotze, The Definite

Integral by Stern, The Theory of the Smallest Quadratics by

Gauss. Beyond these there is a limited choice from: Probability (Wahrscheinlichkeit ~~st~~ <sup>-rechnung</sup>) ~~with~~ Goldschmidt, Minerology with Haussmann, General

Natural History with Griessbach. The most useful to me will

be minerology. ~~Minerology~~ Unfortunately it conflicts with Gauss'

lecture, since it is scheduled at 10 o'clock, and <sup>so</sup> I'd

be able to attend only if Gauss moved his lecture forward,

otherwise it looks like it won't be possible. General Natural

History would be very interesting, and I would certainly attend,

if ~~it~~ along with everything else I had enough money. I would  
receive the greatest thanks if I enrolled in Probability, since

Goldschmidt has only one student and ~~must give up his~~ therefore

~~must give up his~~ <sup>series without me.</sup> ~~lecture without which I cannot~~

must give up his lecture series without me. Otherwise things are  
going very well in my affairs. I limit myself to few needs and

~~series~~ comforts outside of the ~~a~~ forementioned arrangement with

Goldschmidt, which can easily be very rewarding ~~for~~ to me.

Reincke's

I have already heard ~~Reincke's~~ first lecture, which was

rather interesting. He summarized his lectures from the

~~in~~ the previous semester, which he ~~had~~ had announced as

Modern and Recent Church History From the Reformation On,

~~but~~ had only ~~covered~~ covered the Reformation. I wonder how

surprised he'll be, when I <sup>hear</sup> ~~attend~~ this part of Church History without

having heard the previous part.

~~Max~~. Mar. 30, 1849.

The next letter, dated March 30, 1849, written from Berlin where he is a student:

Dear Father -

Easter is ~~at the door~~ now upon us and I ~~am~~ still haven't gotten

around to writing you. You know yourself only too well, how

everything is going with me, <sup>(and so</sup> I hope ~~that~~ that at least you are

not worried about me. Thanks to God, I am <sup>on</sup> the road ~~and~~ and

things have turned out as I wished. From Dcenitz to Ludwigslust

I again traveled with the inescapable Mr. Blumenthal, who

~~greatly~~ complained <sup>(much</sup> about the bad times and the radicals.

~~As~~ As I arrived here, I was faced with bayonets, the area was

occupied ~~with~~ by soldiers and a junior officer went from

coach to coach ~~asking for papers~~ asking for traveling papers.

Whoever could not account for themselves ~~sufficiently~~ adequately

would be taken to ~~the~~ the city jail. I was let through after

showing my student card. ~~xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx~~

In Ludwigslust I heard that my apartment was not <sup>yet</sup> leased and

so returned gladly to my old place. ~~I was just in time for~~

had come  
I ~~arrived~~ just in time for the lectures <sup>of</sup> Dirichlet and Jacobi.

Jacobi had just begun a new series of lectures in which he  
lead off once again with the entire system of the theory of  
Elliptical functions <sup>in</sup> ~~over~~ the ~~highest~~ ~~most~~ ~~advanced~~ ~~the~~ most  
advanced, but elementary ~~scientific~~ way. So it was easy for me  
to get into step and so I have been to his class regularly for  
the past four weeks. Unfortunately I have not yet been able to  
get a textbock (Heft). I have a promise for one for next semester.

Also Dirichlet has arranged for me to have access to the library,  
~~with~~ ~~out~~ ~~his~~ ~~assistance~~ ~~without~~ Without  
his assistance, <sup>I</sup> I feared, there would have been ~~difficulties~~  
obstacles. I am usually in the reading room by nine in the morning,  
to read two ~~papers~~ papers by Gauss that are not available anywhere

else. I have looked fruitlessly for a long time in the catalog  
of the royal library for another work of Gauss, which won the  
Copenhagen prize, and finally <sup>just</sup> got it through Dr. Gale of the

So  
Observatory. ~~It~~ I am still studying it.

~~had~~  
~~After I received the missing letter of recommendation from Dirichlet,~~

Because of my ~~missing~~ school leaving-certificate, I in the first days of my stay here I was before three university committees -- after I had received the missing letter of recommendation from Dirichlet. Of course, because of my long absence I had been removed from the student register. ~~Unobtainable~~ After paying 4 Taler 20 pro fisco, I obtained my registration papers without further ado. It says that I continued as a student here up to the end of this semester. So I don't need any papers from the highly praised Quickborn administration.

Another letter without date, written from Berlin, reads as follows:

I just re-read your dear letter which you wrote to me at the beginning of this semester. You raised there a number of questions, whose answers will still be of interest. The selection of my courses was somewhat difficult for me, <sup>partly</sup> there were a number that I had audited and would gladly continue attending, time and money permitting. Many days of the week I must be out of the house from 8:30<sup>AM</sup> to 4:00<sup>PM</sup> and again from 6:00<sup>PM</sup> to 8:00<sup>PM</sup>. Aside from the courses, which I had already chosen in Quickborn, I had enrolled with five other students into a private ((Privatissimum)) class with Eisenstein, who was promoted in the course of this semester <sup>(to)</sup> as a lecturer (Privatdozent) with a paper on the theory of elliptical functions. ~~HE~~ held his sessions three times a week (from 9 to 11) and since I had to go a rather long distance to his house, some 35 minutes, this took up about 3 hours. For some time I had a



great deal of contact with him and we went walking together daily. And since he has considerable talent, I think that this was very useful for my scientific development. BUT now I have distanced myself from him somewhat, on grounds that I <sup>wish to</sup> tell you in person. He has sought to win Gauss' favor and was recommended to Alexander von Humboldt by Zwiesing.

From 11 to 12 I attended Dove's Optics, a very interesting lecture, and from 12 to 1 I frequently audited Reincke's <sup>(2)</sup> Recent History. Whenever possible, I attended this lecture, because the way that he portrays the conditions from which our entire current era has developed, is truly magnificent. But as you see, <sup>(was)</sup> I already very overburdened and since his classes were always full, I could audit the lecture sporadically.

Otherwise, from 2 to 3 I still attend Dirichlet's Number Theory and Enke's Spherical Astronomy from 3 to 4.

I already knew this Enke to be Franz Johann before

I sent you my first letter,

~~the departure of my first letter to the black board~~

~~(an Schwartzgen Brett).~~ I had merely forgotten to

write you about this. I told him that you went to

school with him, and as I told him further,

when you would be in Goettingen, he asked to be

remembered to you, to say hello and tell you that it

is a great joy that I am now here studying under his

direction. His presentation is <sup>(for the most part)</sup> rather dry and boring,

however the time that we spend at the observatory

once weekly <sup>PM PM</sup> from 6 to 8 is useful and instructive.

As you perhaps have <sup>(already)</sup> heard, he has recently experienced

the misfortune, that his namesake, Postmaster Henke,

'discovered' a couple new planets among <sup>his</sup> ~~the~~ mailbags,

so that in the area where previously three small

planets were thought to move, now there are five,

a misfortune <sup>perhaps</sup> for him, since especially in France both

names are pronounced Henke, never Enke. My own course

of specialization is the one with Dirichlet; he lectures

on an area of mathematics, to which Gauss owes his entire

reputation. I have applied myself very strenuously to this subject, not without success, I hope.

I have paid my respects to Grille. He was very friendly towards me, but he appears to be no special luminary. He considers the work on the stars suitable for publication in his journal, but I disagree because it does not appear to have any practical value. ~~But~~ I now hope to replace it with something better.

Unfortunately my studies have taken so much of my time, that I have not yet been to Buhle's since Pentacost, when I was invited to dinner there on the Kaiser's birthday. It is only possible for me to go to his house once a week, namely, on Sundays, if I don't want to neglect my studies.

March 12th, 1848.

Next is a letter of March 12, 1848, in which Riemann wrote his father that he would like to attend Jacobi's lectures on higher mathematics and would therefore like to stay in Berlin for another term. How far Riemann was also interested in politics we can see from the following extract:

Again I read the date over your letter once more, February 24, a day, which will reshape half of Europe with its consequences. What uproar reigned here when the first telegraph report from France arrived, you well can imagine. Immediately after the receipt of your letter came the report that the republic had been proclaimed and the palaces of Louis Phillipe destroyed. I therefore had no respite to quickly answer your letter as I had planned. The political news that each day now brings I do not write about because I am certain that your newspapers include it all. Perhaps, however, I will be able to tell you much more during the holidays.

At Easter 1849 Riemann returned to Goettingen. From there he wrote to his father on June 19, 1850:

After a long interruption I have finally <sup>begun</sup> ~~come to carry~~  
~~out a definite start for~~ a letter to you. I had run  
aground and now must attempt to get afloat again.

~~So~~ Unfortunately I still have no prospects but am still  
in good spirits. For the next semester, in accordance  
with your wishes, I have applied with Hermann for  
for admission to the Pedagogical seminar ~~together with~~  
~~Unum Momentum (?)~~. He said that from the outset he  
had counted on my participation in the seminar  
next semester. And just at Easter, in order to  
enable my entrance in any case, he told me that he  
was willing, if I desired, to waive the requirements.

And I will let you know when it is ready for the press  
and ask you to give it the necessary polish.

Because the dissertation must be printed before <sup>the formal</sup>  
announcement, I must postpone my promotion til  
next semester.

On September 29, 1851, Riemann wrote to his father:

Once again my sincere thanks for your charming letter  
and for the birthday present. One of the wishes that  
I made on my birthday is <sup>(now fortunately)</sup> close to fulfillment. My  
dissertation is ready for the press and I hope to  
defend it as soon as possible. It was about time  
since it is wedding time! (Es war aber auch hoeschste  
Zeit. -- a pun, tr.) For I have shelter here only  
through the kindness of my landlady, since I gave notice  
(to leave) at Michaelmas.\* In any case, I plan to  
bring Helena for the first time to the paternal home.  
I can then discuss and go over everything <sup>(further)</sup> with you  
in person. I have tentatively planned to stay with  
you for a part of the Winter and to work on my  
Habilitation paper (Habilitationsschrift) there.

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\* A festival for Archangel Michael on September 29.

Next is a letter to his brother with the post date  
November 26, (1851<sup>7</sup>) that begins with:

Finally with the discussion with Aunt Julie,  
the ice is broken.

Finally I can announce to you that my dissertation  
is printed, and next comes the Doctor.\* I turned my  
manuscript over to the faculty on <sup>the</sup> Friday after Helen's  
departure. Whereupon Gauss took it home to examine for a  
few days and by the end of last week it had already  
circulated among the faculty. My examination is  
scheduled first for next Monday.

When I was with GAUSS on Saturday, he had not yet  
read my essay, but told me, that for years he has been  
preparing an essay, on which today he is still occupied,  
whose subject is the same or at least in part the same

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\* Riemann here refers to himself.

as that covered by me. Already in his doctoral dissertation now 52 years ago he actually expressed the intention to write on this subject. I do not yet know his opinion of my work since I did not find him at home last Saturday, when I went by there with a few other men. So I must conclude from the remarks of the rest, for whom I ~~cannot~~ have the least courtesy, that he was pleased with my work.

So I think that my prospects have improved significantly as a result of my paper. Now as soon as I finish my Habilitationsschrift, I can obtain permission to lecture. As you already know, I plan to work on it this winter in Quickborn and I hope that it will go faster and better, since I have recently gotten somewhat into working order.

In a letter of DEcember 13, 1851 Riemann reports to his brother that his promotion to the philosophical faculty will be combined with a public debate.



✓ ?  
1852 on file  
wrong  
On February 5, 1854 Riemann wrote to his father the following letter:

Right after submission of my Habilitationsschrift I resumed my investigations into the ~~connectedness~~ *coherence* (Zusammenhang) of the laws of Nature and got so involved in it that I could not tear myself loose. The continuing preoccupation with it has become bad for my health, in fact, right after New Year's my usual affliction set in with such persistence, that I could only obtain relief through the strongest remedies. As a result I felt very ill, felt unable to work, and sought to again put my health in order through long walks. For eight days now I have felt better.

The Oral Presentation (Probevorlesung), which I am to give before the colloquium, is half completed. And your letter and the thought of you should be a spur to me, to allow nothing to interfere with my work again.

On June 26th 1854 Riemann wrote to his brother:

At Christmas I wrote to you from Goettingen, I think, that I had completed my habilitation paper at the beginning of December, submitted it to the dean, and soon after once again turned to my investigation on the coherence of the fundamental laws of physics; also that I so immersed myself in it, that when the theme for my examination lecture was posted at the colloquium, I could not immediately tear myself away. Right after, I came down sick, partly, of course, as a result of too much brooding, and partly as a result of sitting a lot in my room during bad weather. My old sickness set in again with great tenacity, and so I did not make much progress in my work. It was only after several weeks, as the weather got better and I sought more company again, that my health improved. I have now rented a garden house for the summer and since then, thank goodness, I have had no complaints about my health. About fourteen days after Easter, after I had finished another task that I could not very well avoid, I turned eagerly to working out my examination lecture, and I was finished with it at Pentecost. It was only through much effort that I was able to do my colloquium at the same time, so that I would not have to leave for Quickborn with unfinished business. Gauss' state of health has become so poor lately that it is feared he may die even this year, and he himself felt too weak to examine me. He then

desired that I wait until August for his improvement, because I could only begin to lecture next semester anyway. I had already accepted the inevitable, and then--on my repeated requests "to get it off my back"--he suddenly decided at noon on the Friday after Pentecost to set up the colloquium for ten thirty on the next day. And so by one o'clock on Saturday I was luckily finished with it. Let me now tell you in all haste, what the state of affairs is with the other work that occupied me at Easter. During the Easter holidays, Kohlrausch--a son of the chief school inspector and a cousin and brother-in-law of Schmalfluss--who is now a professor at Marburg, visited Weber for 14 days to conduct with him an experimental investigation on electricity. Weber had made the preparations, devised the apparatus, and constructed them for one part of the experiment, and Kohlrausch did the same for the other. I participated in their experiments, and became acquainted with Kohlrausch through this opportunity. Some time previously Kohlrausch had made very precise measurements of a phenomenon that was uninvestigated up until then (the electrical residue in a Leyden jar) and published them, and I found the explanation for this through my general investigation into the relationship among electricity, light and magnetism. I then spoke to Kohlrausch about it and this <sup>became</sup> ~~was~~ the <sup>cause</sup> ~~cause~~ for my working the theory of it out for him and sending it to him. Kohlrausch then

answered me in a very friendly way and offered to send my work to Poggendorf, the editor of the Annalen der Physik und Chemie, for publication in Berlin. He also invited me to visit him during the autumn holidays in order to pursue this matter further. This is important to me since it is the first time that I have been able to apply my work to a previously unknown phenomenon. I hope the publication of this work will contribute to obtaining a favorable reception for my larger undertaking. Here in Quickborn, of course, I will now have to partially occupy myself with its publication, for the proof sheets will probably be sent to me, and partially with working out a lecture for the next semester.

On April 25, 1857, Riemann wrote an extensive letter to his brother Wilhelm from Goettingen. The letter shows Riemann discouraged. Several times in a week he had spoken to Weber. Weber obviously had influence in important circles at the university that were responsible for the staffing of the observatory. Riemann had put great emphasis on receiving that post. Weber could not or did not want to give Riemann a definite answer.\*

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\* See account of this matter in Dedekind biography. It was Gauss who "protected" Riemann from this job.

In April 1860 Riemann was in Paris for a period of time on the invitation of French scientists. On his return he wrote to his sister Ida about his stay in Paris on April 27, 1860. The letter, written in Heidelberg, follows:

In general I am satisfied with the results of my trip, even if many of the expectations which I had earlier attached to the journey, must remain unfulfilled, necessitated by the shortness of time. In this regard it would have been of little value if I had remained one or two weeks longer in Paris. And so I preferred to return to Goettingen at the right time.

I can not complain at all about a lack of friendliness on the part of the Parisian scholars. The first social occasion, in which I took part, was a tea at Herr Serret's, who had become a member of the institute a few weeks before. Such a tea or "Reunion" contrasts sharply with our socials. It begins at 9:00 PM, <sup>(clock)</sup> really gets going at 10:00 and goes til 1:00 in the morning. During this time guests continually come and go; many

come right from the theatre, which in Paris seldom closes before 12:30. They consist of nothing but tea, ice cream and a variety of sweet-meats, namely, glazed fruits and other sweets of that sort. It cannot be denied that this unrestrained manner has perverted many.

The social gathering at Serret's consisted of 30 to 40 ladies and gentlemen, among whom were <sup>also</sup> several Germans or rather speakers of German. I conversed chiefly with them.

There was much tension over the outcome of the election of a foreign member of the Academie Associe Etranger de l'Institut to replace Alexander von Humboldt.

There is a total of only eight positions and so it is considered a great honor to be one of these eight.

At that time it had come down to a choice between Boehler and Liebig, and Boehler appeared to have the best chance.

But then on Tuesday at a dinner for me at Bertrand's,

I heard that there was concern over offending one of

these two great chemists, and hence neither would be chosen,  
and that Ehrenberg of Berlin had been nominated. The  
latter was then elected, after much delay, at the last  
session--there is a session every Monday from 3 to 6 p.m.  
Naturally I took a lively interest in my old teacher  
Boehler, to whom I would have been delighted to give this  
honor.



Through a letter of September 30, 1863 to a Marseilles transport firm, we learn that Riemann wanted to go to Italy and stay there for a long period of time. In Italy he not only had<sup>a</sup> frequent exchange of ideas with famous mathematicians, but was also very interested in arts and sciences in general. This we learn from the letters exchanged between Riemann and his wife and relatives. For example, on September 7, 1864 he wrote to his wife from Florence:

I agreed with Betty to go to the Congresso Paedagogico at one o'clock, where the most important educators (Schulmaenner) and philologists (Sprachgelehrten) of Italy are now meeting in a joint conference. Betty introduced me (to the conference) and so I had to stay until the end of the session. The subject was the organization of a school intermediate between elementary school on the one hand and the Gymnasia and trade schools (Berufsschulen) on the other hand. Those intended for the skilled trades, professions and business would stay

together up to the age fourteen and would be com-

pletely exempt from the study of foreign languages.

In Germany such a school would be impossible, but here

conditions are completely different.

From a letter of Riemann's dated November 29, 1847

written in Berlin we have the following excerpt preserved  
for us by his brother:

When I arrived here, I found to my great joy that  
Jacobi, who had announced no course in the catalog,  
had changed his mind. He plans to lecture on Mechanics.  
I would, if possible, stay here for another semester  
just to attend it. Nothing could be more satisfying *to me*  
than this.

I met Eisenstein on the street on one of first  
days I was here. He was extremely friendly to me and  
asked me to visit him sometime soon. I did not visit him  
until a couple of days ago, partly because I had little  
time and partly because I did not want to become too  
close ~~with~~ him again. He is giving the continuation of  
his course this semester, which I attended last semester.  
I had to give it up however, since it took so much  
time and I thought that I could apply the time better. But  
his presentation has improved a great deal and appears to

have been prepared with greater care and so I will accept his offer to attend without charge. When

I visited him for the first time last Friday. I found him with his collected mathematical essays, which he had just prepared for publication with a forward by Gauss. There Gauss wrote in conclusion that they contain<sup>ed</sup> so much that was splendid and profound that they were a worthy addition to the works of his predecessors. In one place he seeks to wash his quarrel with Jacobi as clean as possible. But it seems to me that he will not meet with much success.

At the conclusion of his collection he poses several problems, whose solution he considers very timely.

The chief problem is the very one I worked on so steadily over the vacation and which I pretty much brought to a conclusion. When I told him some of my results, without stating the way I had arrived at them, he appeared to have a great urge to get to know the entire thing.

*7/10/18  
d. 11/18/18*

I thought it advisable, after my experience with him, to pursue the trail without a companion. He returned my visit the same evening and stayed two hours.

Upon leaving, he invited me to come by for tea. I am not, however, inclined to *do so*.

The next day I went to see Jacobi in order to enroll in his course. He was very polite and friendly. <sup>Because</sup> in his previous lecture he had dealt with a subject related to the problem I had <sup>just</sup> solved. I brought it up and told him of my work. He said if it was a nice job, he would send it to Crelle's Journal as <sup>soon</sup> ~~fast~~ as possible. Unfortunately my time will be somewhat tight for writing it up. Also, I don't know whether the complete solution of the problem will take yet more time.

Last semester, as far as I know, there were only two students from Goettingen; now there <sup>are</sup> many, over 20 of my acquaintances here. Also several mathematicians, such as Stisser, Fischer, Gute, etc.

On April 12, 1848, Riemann wrote the following letter to his brother from Quickborn:

Now some news from Berlin. First I must report from some journalists and proclamations, that the citizens had held the military completely in check and by Sunday, if the struggle had advanced, it probably would have ended with the storming of the palace. From Friday the 24th at 9:00 Am until Saturday at 1:00 PM we kept watch at the Swiss chamber of the royal palace, the antechamber of the royal family. Towards evening, the king himself inspected the watch, asked the name of each of us, and spoke a few words with everyone. Also we had the opportunity in the company of a few noblemen, for example, Prince Wischnowski, to have a few words with the royal prince. We were treated to the royal kitchen, where we could write letters and play Schach and other games. Of the 120 students from Halle who were there, a few even wore their student uniforms.

An April 25, 1857 letter to his brother William:\*

Hopefully my letter of yesterday set you at ease regarding my letter of the day before, and has<sup>s</sup> caused you ~~through the latter~~ no further distress and trouble. ~~(at the beginning of the week that~~  
The two times I was at Weber's, when Kohlrausch was also present, a very unpleasant mood prevailed, especially towards me. There was talk of a storm that threatened. The talk was that <sup>(in May)</sup> there could be a great deal of rain, etc.

Also Weber said that that afternoon he had gone to see ProRector Krauth with Zacharia, Weitz, and other legists and others including Roessler and Agidii. The academic committee had reached a decision unfavorable to me. Apparently Weber has now made an attempt to reverse this and to <sup>keep</sup> ~~hold~~ open for me the prospects of the position at the observatory.

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\* See page 19 above.

Then through my frequent visits to Weber's and through Schering, this became known. As a result Weber has come under such attack from these circles, that he has given up the effort, and now a decision has been reached, which makes it very difficult for me to succeed here in Goettingen. Schering and Krauth are now taking a less considerate attitude towards me. I have been particularly upset by Weber's coolness; the failure of their plans naturally depresses me. I had discussed Dedekind with them freely and was immediately informed by them about this.

He spent an entire afternoon with me and we worked out how to schedule our lectures so they do not conflict. It was very unpleasant for me that word of this also got around so quickly. Also Dirichlet appeared, if still very polite, yet not so well-disposed towards me as before. <sup>(also)</sup> This was agony for me. Dedekind then had the task of persuading me not to give up my lecture course and to announce its commencement. But I did not



want to do that until I knew that it would succeed.

Yesterday, after I had sent you my second letter,

I went to Weber's and was there very graciously

received.

-Kohlrausch had departed the first thing in the morning and so they expected to visit church-councillor Schwarz in the evening. They invited several gentlemen, including Dirichlet and Ewald, in his honor and also invited me.

On my way back, I ran into Mr. Olimir. In the previous semester he attended my lectures for a long time. He comes from Dresden and is very well known to the Weber family. He told me that together with four others he would attend my lectures. They simply didn't know whether I would lecture since I had not announced the beginning of the course. I have now promised to begin Monday, but have not announced this because I think, that it would be much better for my condition and the progress of my work if I visited you for a long time. Also it is rather annoying that besides Selich and ~~Olimir~~ <sup>Olimir</sup> there are a few students, namely Messrs. Mitschik, Zupren, Steiner, who attend perhaps for ulterior motives and you can't do anything with them. Furthermore, they have all already attended my previous lectures.

Last night I walked with Schering and Kohlrausch so late that I didn't venture to go on to Weber's since I would probably have been the last arrival. They have perhaps had the intention to make further announcement of my candidacy (Bewerbung). With that, Laura can come here. It is still very unfortunate that I was not there. ~~Even had I been there~~ Even if I were there now, they would still be at table and Kohlrausch and Schering ~~xxxxxxx~~ also. Concerning the observatory post, I can draw my own conclusions from the remarks of Kohlrausch and Schering during yesterday's walk. Perhaps the whole thing is arranged. ~~Re~~ Perhaps Kohlrausch made more concessions in the allotment and so I may still get the position. At least they spoke somewhat sarcastically about a few well-known, but inobservant astronomers, who indeed in another respect have accomplished wonderful things, but as astronomers, little.

Now farewell, my dear William, and accept my heartfelt thanks for your beautiful letters. I received the first this morning and the second just now.

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Here is a letter of Riemann of December 7, 1851 written  
from Goettingen to his brother William:

Dear William -- I received this evening your dear  
letter of December 6th, but I have not completed  
my reply. I think I'll do this by the 13th.

First my thanks for your letter, which I have read  
with much joy since it expresses a cheerful and peaceful  
mood. I feel, when I compare it to your letters of  
last Fall, how much better the writer seems to be.  
I would be delighted to visit you in Bremen now if  
it does not conflict with your plans.

Unfortunately as a result of my promotion I have  
had to deal with the dean Prof. Ewald, who is a horrible  
pedant and very quarrelsome. He ~~kept~~ held me back  
for over five weeks after submission of my manuscript,  
though otherwise the entire thing only took 14 days.  
My examination began Wednesday ~~eight~~ <sup>eight</sup> days ago. He  
is now insisting on a public ~~disputation~~ <sup>defense of the thesis</sup> even though  
this has not been done in the philosophical faculty for  
10 years. I have avoided greater complications  
~~I must avoid further complications~~ and so ~~must~~ <sup>agreed</sup>.  
Finally today I learned that he scheduled the defense  
of my thesis for December 16th. I will put all my  
work in order beforehand and ~~xxxx~~ plan to leave at  
4 in the afternoon with the Post <sup>of</sup> course, if you  
can make yourself free, to Bremen.