

correspondence may also go to:

Herbert Bailey

John Stachel

~~Helen Dukas~~

Otto Nathan

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JH, sec.

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THE INSTITUTE FOR ADVANCED STUDY

HARRY WOOLF
Director

June 27, 1983

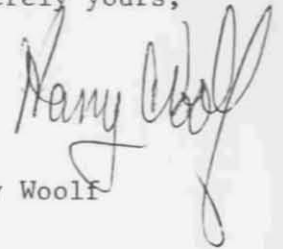
Dr. Otto Nathan
24 Fifth Avenue
New York, New York 10011

Dear Dr. Nathan:

Forgive my delay in acknowledging the arrival of your letter of 2 June 1983. I was abroad when it arrived and have only returned recently. I am glad you wrote the letter, and I think it important to have it in our files.

I hope that you are in good health, and that I shall see you again before too long.

Sincerely yours,



Harry Woolf

ESTATE OF ALBERT EINSTEIN
24 FIFTH AVENUE
NEW YORK, NEW YORK 10011

June 2, 1983

To the Members of the Editorial Advisory Board of
The Papers of Albert Einstein:

Dear Sirs:

I consider it necessary, if only for the record, to ^{correct} record a few of the most glaring misstatements of fact in Mr. Herbert S. Bailey's communication to you dated May 11, 1983. A number of other misstatements and half-truths could be enumerated.

1. It is untrue, as Mr. Bailey well knows, that I had reservations about Dr. John Stachel because he had "too much editorial independence." I have testified about these serious reservations at length, under oath, at the hearings on the arbitration between Princeton University Press and the Estate. The official stenographic record of these hearings is available.
2. It is untrue that I wanted "to replace Dr. Stachel with a combination of three co-equal editors," implying that I intended to remove Dr. Stachel completely from participating in the editing of Einstein's writings. In conformity with the recommendation by the Search Committee of three scientists who, incidentally, had nominated Dr. Stachel only as an "alternate," I suggested to Mr. Bailey that the work on the Einstein papers be entrusted to a Board of three co-equal editors and that Dr. Stachel be appointed one of these three editors. As I advised Mr. Bailey a number of times, both orally and in writing, I had become convinced that the authority over the gigantic and multi-faceted work of Albert Einstein should not be vested in one human being, neither Dr. Stachel nor anyone else (The Writings of Bertrand Russell are presently being edited successfully by a board of five co-equal editors).

When Dr. Stachel was interviewed for the editorial position by Mr. Bailey and me on May 18, 1976, he was asked whether, if offered an appointment, he would accept it either as sole editor or as one of three co-equal editors. His answer was unqualifiedly in the affirmative. Moreover, Mr. Bailey himself negotiated earlier with two scientists about joint editorship in the Einstein papers and, at another time, he suggested that the editorial

work be distributed among several scholars. He obviously did not then consider such a plan "unworkable editorially and financially." He only felt that way when such an editorial machinery was suggested by the Search Committee and me and when Dr. Stachel's sole editorship would no longer have been possible.

3. It is untrue that ninety-five percent of Einstein's correspondence has never been published. Upon the initiative and/or with the cooperation of the Estate, Einstein's correspondence with Solovine, Born, Sommerfeld, Cartan, and Besso was published as well as Schroedinger's correspondence with Einstein, Planck, and Lorentz. In addition, Einstein on Peace was published as were very many letters of Einstein in various publications.

It is characteristic of Mr. Bailey that he continues to slander me almost two years after his great "victory" which was based on an utterly false assertion of the Arbitrator, an alumnus of Princeton University.

Sincerely yours,

Otto Nathan

Otto Nathan
Executor

ON:edh

SW

Princeton University Press

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May 11, 1983

TO: The Editorial Advisory Board of
 The Papers of Albert Einstein

FROM: H. S. Bailey, Jr.

SUBJECT: Fund-raising

I am sending herewith for your information a brief description of the Einstein project which I have put together to help in fund-raising. Possibly you will have a chance to use it, or if you have any ideas as to possible sources of funds, please let me know.

We are seeking funds in Switzerland and Japan and from foundations in the United States. I am particularly eager to identify individuals, with an interest in Einstein, who might be able to make major gifts.

H. S. Bailey Jr.



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Austin, TX 78712

**Dr. Harry Wolf
Director
The Institute for Advanced Study
Princeton, NJ 08540

*Dr. Carl Kaysen
(formerly director of The Institute for
Advanced Study, Princeton)

* Member of original Board, since resigned
** New member

The Papers of Albert Einstein

This is a brief description of the project. Full information is available as needed.

History. The project has a complex history. Einstein died in 1955. In 1971 Princeton University Press signed a contract with the Estate of Albert Einstein, which held the copyrights, making us partners in this venture, with the Press to act as administrator and publisher. We appointed a distinguished Editorial Advisory Board, and with their help sought an editor. Professor John Stachel was appointed and began work in 1977, but in the fall of 1977 Dr. Otto Nathan, the executor, became disillusioned with Professor Stachel (too much editorial independence) and wanted to replace him with a combination of three co-equal editors. The Press, considering this plan unworkable editorially and financially, refused. This led to a series of law suits and an arbitration, all of which we won. Meanwhile Professor Stachel continued his work, but because of the law suits it was difficult to get the financial assistance that we had originally planned on; so the work continued with Professor Stachel alone, plus one secretary. Nevertheless a great deal was accomplished: a computer index of the 43,000 documents was compiled, a duplicate made for editorial work, etc. After the Press won the final law suit, the Estate was ended and the property went to The Hebrew University in Jerusalem, which now replaces the Estate as partner. The Press has had a very pleasant cooperation with The Hebrew University, but it is the Press's responsibility to raise the funds and administer the project.

Scope. The Einstein Archive contains about 43,000 documents, including all his published writings, drafts, notebooks, diaries, and a huge collection of correspondence, ninety-five per cent of which has never been published. His correspondents include most of the important scientists of the first half of this century: Lorentz, Ehrenfest, Bohr, von Laue, Born, Hilbert, Planck, Pauli, Schrödinger, etc., and also such political and cultural figures as Franklin Roosevelt, Weizmann, Freud, Nehru, Russell, Shaw, Schweitzer.

This edition clearly will be of major interest to many physicists, mathematicians, philosophers and historians of science, as well as psychologists interested in the creative process in science. But it will contain material of importance to a much larger scholarly public. The outbreak of World War II prompted Einstein's first public pronouncements on social and political questions as well as the first private comments of which there is any record. From that time on, and especially after he attained worldwide fame in 1919, Einstein was increasingly called upon--or himself felt impelled--to speak out publicly, on many current issues: his views on such topics as pacifism, disarmament, nuclear weapons, racism, anti-Semitism, Zionism, Jewish-Arab relations, socialisms, fascism, communism, civil liberties, religion, education--to give just a partial list--were elicited in well over 400 published articles and interviews. His ever-growing correspondence, while continuing to contain much of great scientific interest, also came to reflect his social concerns. In thousands of letters he exchanged views with a large number of prominent public figures, as well as thoughtfully replying to questions from other correspondents attracted by his magic name.

Only a fraction of these published articles have been reprinted in currently accessible form, while most of the correspondence on these questions remains unpublished. Thus, this edition will be of value to many social and political historians, especially those working on modern German or American history, the pacifist and Zionist movements, disarmament, the League of Nations; as well as to educational theorists, theologians, social philosophers--to name a few fields that immediately come to mind.

Professor Stachel believes that there are many Einstein documents yet to be found, and a search is under way. Recent finds include an unpublished article of about 70 pages, written in 1912, containing the most complete account of the development of the special theory of relativity that Einstein ever wrote, and a number of Einstein letters, dating back as early as 1900.

The edition, which will run to over 30 volumes, will be published at the expense of the Press. The first volume is projected for 1985, and it is hoped to produce one volume per year thereafter, with the possibility of increasing the pace to two volumes per year later. All documents will be in their original language (mostly German) with annotation in English. An English "pony" to the German texts in microform is planned, as are several printed volumes of English-language collections on specific topics such as special relativity, quantum theory, Zionism, and so forth.

Staff. The permanent staff is expected to have five members: the Editor, Professor John Stachel, physicist; the Associate Editor, Dr. David Cassidy, historian of physics; an Assistant Editor, Dr. Robert Schulmann, modern European historian; a second Assistant Editor yet to be named; and an Editorial Assistant, Mrs. Olga Griminger. All staff must be thoroughly proficient in German in addition to their other skills.

Location. The project is at present located in Princeton at Princeton University Press. In summer 1984 it is expected to move to Boston University, where Professor Stachel has a permanent appointment.

Financing and Budget. The project originally received a grant from the National Science Foundation. When the law suits with the Estate began, the NSF was no longer able to support the project, and emergency grants were obtained during the interim from the Sloan Foundation. At a critical time, when it appeared that work might stop for lack of funds, Mr. Harold W. McGraw, Jr., Chairman of McGraw Hill and President of the Trustees of the Press, made a personal gift of \$1,000,000 as an endowment to support the salary of the editor. During critical times the Press has also used its own funds to keep the editorial work going. We are now working under an interim grant from NSF until the major five-year grant for which we have applied can be approved. NSF has appointed a special committee reporting directly to the National Science Board to advise. We have reason to believe that of the \$1.5 million requested NSF will award about half, or \$130,000 to \$150,000 per year for five years. This leaves the Press searching for \$750,000 for the next five years. We also hope to find funding for the more distant future. We are applying to individuals and to other foundations here and abroad.

Herbert S. Bailey, Jr.
Director, Princeton University Press
41 William Street
Princeton, NJ 08540

Princeton University Press

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March 11, 1983

Dr. Harry Woolf
The Institute for Advanced Study
Princeton, NJ 08540

Dear Harry,

This is just to thank you for your note saying that Freeman Dyson has agreed to serve on the special subcommittee of the Editorial Advisory Board of the Einstein project. I do not know when this subcommittee will be called to meet, but I am sure it will be useful on occasion to have a smaller group than the Editorial Advisory Board to which we can turn for advice.

Incidentally, I hope to call a meeting of the Editorial Advisory Board sometime late this spring or possibly early next fall, when the situation in Boston becomes clarified. Thank you for your continued willingness to serve on the Editorial Advisory Board and for your interest and help.

Sincerely,



Herbert S. Bailey, Jr.

/ba



THE INSTITUTE FOR ADVANCED STUDY

HARRY WOOLF
Director

March 2, 1983

Mr. Herbert S. Bailey, Jr.
Princeton University Press
41 William Street
Princeton, New Jersey 08540

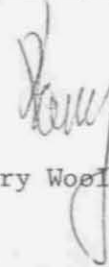
Dear Herb:

I am responding to your letter of 31 January 1983 to tell you that we would like to designate Freeman Dyson as the Institute's representative on that smaller subcommittee of the Editorial Advisory Board that you refer to in your letter. Marshall Clagett, Freeman Dyson, and I will continue to be members of the larger Editorial Advisory Board.

I hope that the move to Boston will not be too disruptive for the project, and that it will advance smoothly and be of benefit to us all.

With best wishes, I am,

Sincerely yours,



Harry Woolf

cc. Marshall Clagett
Freeman Dyson
Thomas Wright

THE INSTITUTE FOR ADVANCED STUDY

HARRY WOOLF
Director

February 10, 1983

Professor Marshall Clagett
School of Historical Studies

Professor Freeman Dyson
School of Natural Sciences

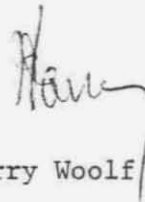
Dear Marshall and Freeman:

The copy of the letter from Herb Bailey which is attached to this note speaks for itself. I am writing to ask you to give me your counsel on the appointment of someone to the smaller sub-committee of the Editorial Advisory Board that Herb Bailey refers to.

I shall call you sometime next week to get your reaction.

Thank you.

Sincerely yours,



Harry Woolf

Enclosure

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ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

January 31, 1983

Dr. Harry Woolf
Director
The Institute for Advanced Study
Olden Lane
Princeton, NJ 08540

Dear Harry,

I understand that Tom Wright recently had occasion to fill you in on the latest developments with our Einstein project. It is a long and complicated story, so I won't repeat it here. The outcome, as you know, is that the project will move to Boston, though the administrative structure, with the Hebrew University and Princeton University Press jointly responsible, will not change. There are still a good many arrangements to be worked out, but the basic decisions have been made.

You and I have been calling back and forth for several weeks, since I had hoped to talk to you personally, but perhaps it is simpler to write a letter. One of the ideas that evolved in our planning for the future of the project is that there should be a small subcommittee of the Editorial Advisory Board (the large board of which you are a member) to meet occasionally and to review the project more closely than is possible for the large board, particularly with a view to guaranteeing the excellence of the published volumes. We have in mind that such a subcommittee should consist of two active members of the Princeton faculty, one from the Hebrew University, one from the Institute for Advanced Study, and possibly one other. Although the Institute for Advanced Study is not officially a sponsor of the project, you have been very generous, and we want to preserve and even emphasize the Institute's relation to the project. Thus we would be very glad if you would indicate who from the Institute should be appointed to this subcommittee. You and Marshall Clagett and Freeman Dyson are the present members of the Editorial Advisory Board from the Institute, but it would be possible to appoint someone else to the Editorial Advisory Board and subcommittee if you thought it desirable.

This is not something that needs to be decided immediately, and perhaps you will want to think and consult about it. In any case it is a matter that I wanted to put before you.

With best wishes,

Sincerely,



Herbert S. Bailey, Jr.

/ba



PUBLISHERS OF BOLLINGEN SERIES
cc: Thomas H. Wright

January 24, 1983

Dr. John Stachel
Princeton University Press
41 William Street
Princeton, New Jersey 08540

Dear John:

Just a short note to say thank you for yours of 17 January 1983, reporting on the Einstein project developments to date. Naturally, I share with you that sense of loss with Helen's death, and we all now realize that the project is off on a new footing.

With all best wishes to you for the New Year, I am,

Cordially yours,

Harry Woolf

Princeton University Press

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John

President, HAROLD W. MCGRAW, JR. *Trustees*, JOHN TYLER BONNER,
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Einstein Project

January 17, 1983

Dr. Harry Woolf, Director
The Institute for Advanced Study
Princeton, NJ 08540

Dear Dr. Woolf:

Enclosed please find a copy of my Annual Report for 1982, as mandated by my letter of appointment. It refers often to the five-year and one-year grant proposals to the National Science Foundation which you have previously received.

Please let me know if there are any other questions you would like to ask or other points of clarification that I can provide.

With best wishes for the New Year, I remain

yours,

John Stachel

John Stachel



EDITORIAL WORK ON THE EINSTEIN PAPERS

Annual Report for 1982
to the

Hebrew University and Princeton University Press

There was substantial progress on the editorial work during 1982. Transcriptions - Handwritten documents from the Archive and other sources are being transcribed in chronological sequence by Mrs. Griminger and Dr. Schulmann. They have completed transcription of all relevant documents through 1910. In addition, two later unpublished manuscripts (a review article on special relativity from 1912 and one on the special and general theories from 1919) have been transcribed with an eye to possible translation and publication in a separate volume. I have been reviewing these transcriptions as well.

Work on Volume I - Planning of the first volume of the Einstein Papers, covering his Student Years (1879-1900) was completed. It will include Einstein's letters, school and other essays, and notebooks up to the time of his graduation from the ETH; selected letters to and about him; as well as contemporary documentary material, and later reminiscences of particular significance about his early years. A search for additional material for this volume will be undertaken by Dr. Schulmann and myself, centered around the ETH Library in Zürich, during the spring of 1983. Annotation of the material, and preparation of chronological and biographical appendices has also begun. In the course of preparing the NSF Grant application, sample annotations of several Einstein letters and the first Einstein paper were prepared and submitted for comment to members of the Editorial Advisory Board and other Einstein scholars. We shall continue this practice in our work on the first volume.

Funding - A major grant application for the coming five years, during which all of Einstein's writings up to his 1914 move to Berlin would be edited, was prepared and submitted to the National Science Foundation. Several important questions must be resolved before the NSF will take final action on this proposal, notably the question of inclusion of full English translations of all German documents in the edition proper versus publication of a separate

series of selected translations; and the site of the project, which I have proposed be moved to Boston, where I hold a tenured professorship at Boston University.

Pending action on this five-year proposal, and at the suggestion of the N.S.F., a one-year bridging grant proposal was submitted and approved by the N.S.F. This includes funding for the present staff of two (the editorship is funded by the McGraw endowment) plus funding for English translations of material in the first volume, to provide more evidence for the decision on whether to include complete translations in the edition.

Translators - Mrs. Sonja Bargmann, longtime translator for Dr. Einstein, has agreed to translate the 1912 unpublished manuscript mentioned earlier, and to advise us on the selection of other translators. Samples for translation have been given to about a half-dozen candidates, and a choice will be made early this year.

Search for New Material - Although a major systematic search for new documents still awaits funding under the five-year grant proposal, many new documents have been obtained from a large variety of sources during 1982, some of great interest. In addition to correspondence with a number of libraries and archives, and regular perusal of auction catalogues, a number of visits to archives were undertaken this year in connection with trips by the staff. Dr. Schulmann visited the Office for the History of Science and Technology at U. of California, Berkeley, to check the files of the Inventory of Sources for the History of Twentieth-Century Physics, resulting in the addition of several important documents to our files. He also examined the UCLA archives, and obtained copies of Einstein letters from several private persons in the Los Angeles area. I visited the Weizmann Institute, which holds Einstein's reprint collection, uncovering a number of annotated reprints; the Weizmann Archive and the Hebrew University Library, resulting in discovery of a number of new items.

Associate Editorship - An important addition we hope to make to our staff in the near future, when funding becomes available, is a historian of science as Associate Editor. It seems unlikely that we shall be able to secure a suitable person with senior rank (Drs. Martin Klein and Russell McCormach declined to be considered for the post), so we have decided to look for less senior can-

didates. Three candidates with suitable qualifications have indicated interest in the position and will be interviewed early in 1983.

Death of Miss Dukas and Transfer of Archive - 1982 saw a sad loss to Einstein scholarship with the death of Helen Dukas. Shortly before her death the Einstein Estate had been dissolved and its assets, notably the Einstein Archive, passed into the possession of the Hebrew University in Jerusalem. After her death, arrangements were made to transfer the Archive to Jerusalem. Before this was done, the editorial staff was given the opportunity to spend several days checking doubtful points in our transcriptions, made from duplicates, against the originals; as well as photocopying additional documents in the Archive which had previously not been duplicated. I visited the Archive in its new home in Jerusalem, and established working contact with the Librarians of the Hebrew University in charge of the Archive.

Additional Activities - Dr. Schulmann chaired a session on "Translating Foreign Texts," at the annual meeting of the Association for Documentary Editing, at which the question of procedures for dealing with the question of translation of the Einstein Papers was also discussed. I gave talks at the Van Leer Institute in Jerusalem and elsewhere on editing the Einstein Papers and other topics related to Einstein's life and work.

Plan and Budget for 1983 - Plans and budgets for the coming year are discussed in detail in the one-year and five-year N.S.F. grant proposals mentioned above. We shall have to work under the limitations of the one-year grant until (hopefully) it is superseded by the five-year grant. The N.S.F. has told us this switch-over may occur before the end of the one-year grant period, if our larger proposal is approved before then.

I have been unusually fortunate in choice of collaborators. Mrs. Griminger, Dr. Schulmann and I have been able to work harmoniously and, I believe, effectively - at least as far as the first two are concerned. Mr. Bailey's steadfast support continues to be a source of strength. Professors Reuven Yaron and Milton Handler, representing the Hebrew University, have been most cooperative in complying with our many requests for help, as have been

many members of the Editorial Advisory Board who responded to written or telephone queries during the last year.

The dissolution of the Einstein Estate marks the end of an epoch of Einstein scholarship, during which the Einstein Archive was built up under the leadership of Dr. Otto Nathan and Miss Dukas. A generation of Einstein scholars owes a great debt to both of them. I should like to close by paying tribute to the memory of Helen Dukas, whose example of dedication will always inspire us in our work on the Einstein Papers. How I wish she could have lived to see the first volume, at least.

John Stachel

January 6, 1983

Professor Roger Dashen
Executive Officer
School of Natural Sciences

Dear Roger:

I am replying to the memorandum dated 23 December 1982, concerning the long-term membership for John Stachel. As you already know informally, Mr. Stachel has turned down Princeton University's invitation to accept a permanent position and so the need to create a reciprocal and balanced position for him here has vanished.

Thank you very much for your cooperation. I am sorry that the project to edit the Einstein papers will now leave the Institute and the Princeton area.

Sincerely yours,

Harry Wolf

cc. Marshall Clagett
Freeman Dyson

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Telephone (609) 734-8054

SCHOOL OF NATURAL SCIENCES

December 23, 1982

MEMORANDUM

To: Harry Woolf
From: The School of Natural Sciences
Subject: Long-Term Membership for John Stachel

The School agreed that John Stachel could be granted a Long-Term membership in the School of Natural Sciences provided it was understood that in his case this did not imply any obligation for support on the part of the School. In particular, we did not approve the appointment of any members under his direction. Thus the title is an honorary one and does not extend beyond the limits of his work on the Einstein papers.

We also request that whenever Stachel's name is listed under Long-Term appointments it carry the qualification (Einstein Papers). We think that it is appropriate that Stachel also receive an honorary appointment in the School of History since his work is historical. We request that you ask the School of History to join us in this hospitality.

JNB:lu

Princeton University Press

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Einstein Project

December 21, 1982

Mr. Herbert S. Bailey, Jr.
Princeton University Press

Dear Herb:

This morning I informed Dean Lemonick that I cannot accept Princeton University's kind offer. I know that you will be disappointed personally and as an officer of the University. As Director of the Press and my friend, however, I doubt that you are surprised and believe that you understand my position. Before accepting the editorship of the Einstein Papers, and regularly thereafter whenever the question arose, I have made it clear that I could not give up a tenured position at Boston University for any position which, under our contract, can be terminated with six months notice. We discussed this last spring during our meeting with Dean Lemonick, at which I stated that moving the project to Boston University seemed to offer a solution to the problem.

As you know, our contract vests joint responsibility for siting the project in us. Acting on my share of the responsibility, I informally contacted several members of the Boston University Administration. They expressed great interest in hosting the project, as I informed you. On August 16, President Silber wrote you, formally offering the University's cooperation and setting forth certain proposals for implementing it. These proposals seem to me to form the basis for further serious exploration of this possibility.

You suggested early in the fall that we hold off such exploration to give time for the Einstein Committee of the Press Trustees to discuss the question and Princeton University a further chance to respond. The University's response has come and does not essentially move beyond the point reached last spring in our meeting with Dean Lemonick.

I know and respect the strong reasons of sentiment which suggest that the project remain in Princeton. Similar reasons of sentiment, and now the physical presence of the Einstein Archive, could be adduced for moving the project to Jerusalem. Neither of these seem practical alternatives at the moment, when we can no longer delay the decision about a permanent



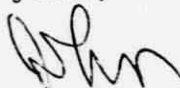
Mr. Herbert S. Bailey, Jr.
page 2

site for the project. The National Science Foundation has stated that it cannot proceed to final consideration of our five-year grant proposal until this question is resolved. In addition, we must soon hire additional permanent staff and purchase word-processing equipment.

When we agreed last fall to postpone discussion of the Boston University offer we also agreed to try to resolve the siting question by the end of this year. I so informed the National Science Foundation in my letter of October 19, of which you have a copy. We have already fallen behind this schedule. I strongly urge that we proceed to explore the Boston alternative without any further delay.

With best wishes, as ever,

yours,



John Stachel

c.c.: Reuven Yaron
Milton Handler
The Editorial Advisory Board

Princeton University Press

41 WILLIAM STREET
PRINCETON, NEW JERSEY 08540

(TEL. 609-452-4900)

President, HAROLD W. MCGRAW, JR. *Trustees*, JOHN TYLER BONNER,
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ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

December 20, 1982

Professor Reuven Yaron
6 Magnes Square
92 304 Jerusalem, Israel

Dear Reuven,

As you know from our discussion in New York earlier this month, the Einstein project is going well. I understand that the documents have been transcribed up to 1910, and some very interesting new material has been discovered. John Stachel and his assistant, Robert Schulmann, will be making a trip to Europe this spring to look for other materials in archives where they expect to identify still more documents. I have felt all along that the project is in the right hands, and our problems have been mainly financial and bureaucratic.

In New York I mentioned also that Princeton University was preparing to make John Stachel its best possible offer, hoping to keep the Einstein project in Princeton. Our Trustees, including a number of senior officials in Princeton University, feel very strongly that the project should stay here, and we hope that John will find the offer acceptable. Until now, as you know, he has been employed by Princeton University Press, on leave from Boston University. Boston University has been generous in allowing him to remain on leave since 1977, but it is doubtful that they will permit him to remain on leave indefinitely, and so we have sought to provide a position that would attract John to stay in Princeton permanently. Since the offer comes from Princeton University, the Dean of the Faculty and I will be seeing John this afternoon to put it before him; I do not expect that he will give us an immediate answer, and in any case I feel that you and the Editorial Advisory Board (which is receiving copies of this letter) should know what we are proposing. I know that The Hebrew University also hopes that the project will remain in Princeton, and I want you to know that we are doing everything we can to achieve this.

The position offered will be that of Senior Research Scholar/Editor of the Einstein Papers. This is exactly comparable to the position held here by the editor of the Thomas Jefferson Papers, and it includes a continuing appointment for the life of the project, or until retirement. That is, if the project should be completed before John Stachel reaches retirement age, he would still have appointment here, with other duties assigned, backed by Press support. Realistically, however, it is not likely that John will complete the task before age 70, judging from experience with other similar projects. The post calls for a salary increase



Professor Reuven Yaron
Page 2
December 20, 1982

that should also be attractive. The University would provide appointments in the research category for associate editors and other staff members.

We have also had extended discussions with Harry Woolf concerning the possibility of an appropriate parallel appointment at the Institute for Advanced Study. Such an appointment, strongly supported by Harry, has been approved by the faculty of natural sciences at the Institute, and will be recommended to the entire Institute faculty for approval. With this support, it would be surprising if an appointment were not forthcoming, though nothing is certain until the faculty has actually voted. Assuming approval, and if John accepts the appointment, Harry is enthusiastic about moving the project onto the Institute grounds, where space is available, and where suitable related arrangements can be made.

We hope very much that John will accept this proposal. There are many strong reasons for wishing to keep the project in Princeton, including administrative efficiency and convenience, and the historical identification of Einstein with Princeton (which has already been a significant factor in our ability to find support for the project).

Whether or not John accepts this offer, there is another matter of administration which I would like to take up with you. Since the resignation of Professor Gillispie from the Editorial Advisory Board and since the retirement of Professor Bargmann, there are now no active Princeton faculty members on the Board. It would seem desirable to make some appointments from the Princeton faculty, probably two. I would like also to have an executive committee of the Editorial Advisory Board to review the project periodically and to advise the Press as administrator. It would be appropriate for one of the Editorial Board members from the Institute for Advanced Study to be a member of such an executive committee; this is of course very much in line with the provisions of our 1971 contract.

Finally, I have not forgotten that we planned to have a meeting of the whole Editorial Advisory Board sometime this spring, presumably when the current questions regarding John's appointment and the location of the project have been settled. I'm sending a copy of this letter to the Editorial Advisory Board, so that they will be aware of what is happening, and in due course, when we are able to set a time for a meeting of the Editorial Advisory Board, I shall send them notification and an invitation to attend.

With best wishes,

Sincerely yours,

/ba

Herbert S. Bailey, Jr.

cc: Milton Handler
John Stachel
Harry Woolf
Aaron Lemonick
The Editorial Advisory Board

John Bahcall. For your information,
I would like this back eventually.

Freeva

Princeton University Press

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December 20, 1982

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Professor Reuven Yaron

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December 20, 1982

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With best wishes,

Sincerely yours,

/ba

Herbert S. Bailey, Jr.

cc: Milton Handler
John Stachel
Harry Woolf
Aaron Lemonick
The Editorial Advisory Board

December 17, 1982

PERSONAL

Dean Aaron Lemonick
9 Nassau Hall
Princeton University
Princeton, New Jersey 08544

Dear Aaron:

Though events have quickly flown past
any comments I can make in reply to your
letter of 17 November 1982, I answer it
nevertheless in order to close that circle
of our correspondence.

Do let me know how things are going.

Sincerely yours,

Harry Wolf

AL

Princeton University

DEAN OF THE FACULTY

9 NASSAU HALL

PRINCETON, NEW JERSEY 08544

November 17, 1982

Dr. Harry Woolf
Director
Institute for Advanced Study
Princeton, New Jersey 08540

PERSONAL

Harry,

Following our meeting, I asked Tom Wright to look into various aspects of the contractual agreement between John Stachel, the Press, and the estate (Jerusalem University). Attached is a memorandum which he has just sent me.

Meanwhile, we are following through on the procedure for offering John Stachel the position of Senior Research Scholar and Editor of the Einstein Papers here at the University. What will happen at the point that we make him the offer I do not know, but Tom's memorandum was, in part, to prepare for contingencies. I will be back in touch with you very soon to see what your thoughts are about the part that the Institute would want to play.

It was good to talk with you. I hope that we can, together, make this all come out right.



Aaron Lemonick
Dean

AL:bmm
enclosure

cc: President W. G. Bowen (w/enc.)
Mr. T. H. Wright, Jr. (w/enc.)

Princeton University: DEPARTMENT Office of General Counsel & Secretary

To Dean Aaron Lemonick

DATE November 17, 1982

SUBJECT Einstein Papers

FROM Thomas H. Wright

Dear Aaron:

This is written in response to your question how the "Publishing Agreement" between the Princeton University Press and the Einstein Trustees, and the "Employment Agreement" with John Stachel may bear upon the courses of action that you see unfolding, as you have described them to me.

(1) Support for Stachel. If the University provides a senior research appointment to John Stachel, it will of course be looking to project funds for support of the position. Those funds would come from the Princeton University Press (which now holds an endowment for this purpose, and in addition the Press expects to be the recipient of NSF grants which might be used in part for this purpose). The appointment of Stachel would presumably state explicitly that his University position would be contingent upon continuing receipt of such funds from the Press. That condition is adequate protection for the University. It may of course raise questions in Stachel's mind since the University's commitment to him would be entirely dependent upon a continuing flow of funds which are not legally obligated to be made. It may therefore be that an explicit agreement between the University and the Press will be necessary to satisfy Stachel.

(2) Level of Stachel's Salary. The Employment Agreement provides that Stachel's "salary will be equal to that which (he) would have been paid for a twelve month year by Boston University, were (he) not on leave. In addition since (he) will be on leave from Boston University, (his) fringe benefit program will be paid to the same extent that Boston University would pay (him) were (he) on active duty there." Stachel will be required to terminate his position at Boston University if he receives a Princeton appointment. His salary (and benefits) would then be set each year through the regular Princeton salary process for research appointees. The Employment Agreement contemplates this possibility, and provides that "if (he) should change (his) academic affiliation, similar arrangements on salary and fringe benefits will be made, but such change shall not result in any other change in the terms of this Agreement."

INTER-OFFICE CORRESPONDENCE

(3) Role of the Institute. Whenever I reread the Publishing Agreement, I am struck with how important a part of the original arrangements was the Institute for Advanced Study. It was contemplated that other organizations might also play a role, but it seems not to have ever been contemplated that the Institute would not play a role. Of course the Institute was never a party to the Agreement. Nevertheless, its role in the Agreement can be made an affirmative argument why the project must stay in Princeton -- if the Institute does in fact play some significant role.

(4) Location of the Project. If the Press asks that the project be "located" in Princeton, and Stachel asks that it be "located" in Boston, either party could then request arbitration under paragraph 8 of the Employment Agreement which invokes the rules of the American Arbitration Association. The American Arbitration Association would not intervene unless asked to by one or the other party. If the parties disagreed, but neither one wished to press the matter, the Agreement could of course be terminated (or modified) with mutual consent. For the Press to succeed in pressing its desire that the project be located in Princeton, the Press must have rational reasons. We can already tell what Stachel's reasons for wishing to locate in Boston would be, and they are on the whole reasonable ones. An arbitrator would probably give some positive weight merely to the simple personal preference of the editor, since the Agreement with the editor gives apparently equal weight to the editor and to the Press in making the decision. The kinds of things that could be properly brought forward by the Press would include:

Convenience in exercising its role as administrator (there are references in the Employment Agreement to the direct involvement of the Press in such matters as "the format of the printed volumes..., including design and typography.").

The important role envisioned for the Institute in regard to editorial oversight.

The wishes of a major donor and supporter of the project.

This is an area that must be considerably elaborated, in explicit concrete detail, if an effective position is to be developed.

(5) Sponsorship of Boston University. If the Press were to permit Stachel to locate himself physically in Boston, under the aegis and sponsorship of the Press, with whatever connections to the Institute (or the University) the Press could reasonably

- 3 -

work out, Stachel would have virtually no basis for insisting upon recognition, sponsorship, or any other formal arrangement with Boston University. The reference to a joint role for Stachel and the Press in deciding upon "the location of the Einstein Office" gives Stachel in my view no right to insist upon a relationship with Boston University. This interpretation is bolstered by inclusion in the paragraph describing the Einstein Office of the statement that "the staff of the Einstein Office, under grants received, will be employees of either the Institute or the Press, depending on arrangements for specific grants." While Stachel may reasonably ask that the project be in Boston, because certain facilities, informal sponsorships, relationships, or the like would flow from that, and while the Press must have rational reasons for opposing such physical location, there is no warrant in the Agreement with Stachel for him to insist upon affiliation with another institution in the Boston area against the wishes of the Press. The Press has considerable latitude for refusing other institutional affiliations, provided the Press has made adequate alternative arrangements for editorial oversight and for clerical, etc. needs.

(6) Possibility of Part-Time Editorship. With respect to part-time editorship, the Employment Agreement envisions the possibility in the following language: "It is understood that you are to be engaged in editing the Papers of Albert Einstein on a full-time basis, with one months vacation annually, regardless of the terms or payments periods of your academic employer." On the other hand, and very oddly, the following sentence also occurs in the Agreement: "If and when you return to your teaching duties at Boston University on a part-time basis, your salary and fringe benefits will be paid in proportion to time spent on the Papers of Albert Einstein." Altogether, I would interpret the Agreement as not permitting Stachel to change to half-time status unilaterally. This would be grounds for terminating the contract in my view.

THW:caf

Princeton University Press

41 WILLIAM STREET
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(TEL. 609-452-4900)
(TELEX 181160)

President, HAROLD W. MC GRAW, JR. *Trustees*, JOHN TYLER BONNER,
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ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

July 15, 1982

To: Members of the Editorial Advisory Board

From: John Stachel

A copy of the completed NSF proposal is being sent to you under separate cover. It has already been submitted to Washington. Thanks again to all members of the Board whose comments helped in revising the earlier draft.

John Stachel



cc. F. Dyson
M. CLAGETT

Princeton University Press

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July 6, 1982

Dr. Harry Woolf
The Institute for Advanced Study
Princeton, NJ 08540

Dear Harry,

I have delayed answering your letter of June 11 partly because I have been away from the Press but also because I wanted to review our correspondence, consult advisers, and think the matter over carefully. It is obvious that there has been a misunderstanding and that we should have tried to work out clear arrangements for the future last fall, as soon as the final legal obstacles with the Estate had been cleared. You and I both proceeded on assumptions that have proved to be different.

I have carefully reviewed our correspondence back to February 28, 1979; earlier discussions are probably irrelevant except that it has been hoped since the original arrangement between the Estate and the Press in 1971 that the Institute would play some substantive role in the project. This idea has been considered in various ways, including especially the suggestion of a Program of Einstein Studies which you liked at first but then rejected in July 1981, leaving the matter open as a possibility for the future. During fall 1981 and spring 1982 we had several discussions and exchanged a series of letters regarding (a) the return of the Einstein project to the Institute, and (b) the relation of the Institute to the project. I have assumed all along that the project would return to the Institute, though the arrangements and terms were not definite; it was not clear, for example, whether rent would be charged (or at what rate) or whether some other arrangement would be made. I repeatedly raised the question of the status of the project, and while your letter of March 31, 1982 says that the staff will be "employees of the project to whom we have extended the courtesy of our facilities," it also says that "any other status, membership, Faculty status or the like is a matter for the Schools and shall be so placed before them," remarking that you will seek advice from Professor Dyson and Clagett. I think you can see from this why I believed that the Institute was considering some further role. I also recalled your earlier suggestion that you might help in raising funds for the project.

As for the rental arrangement, I did not learn until February 10 that the proposed rental rate would be \$1,200 per month. I remarked in your office that the amount seemed reasonable, which I think it is, and I again raised the question of the relation of the project to the



Dr. Harry Woolf

Page 2

July 6, 1982

Institute. Clearly these matters have been tied together in my mind, and that is why I have made repeated efforts to explore possibilities and have asked for the results of your discussions with Professors Dyson and Clagett; at the same time you have seen them as unrelated and have expected the project to move back regardless.

I have written at such length because I think it is important to get at the source of this serious misunderstanding. Your letter of June 11 has now made it clear that the Institute will welcome the project as a tenant and will extend the courtesies of the facilities to the staff, but will not play any other role. That is still a possibility for us; the location at the Institute is appropriate and attractive, and I hope you will hold that offer open. But before making that commitment we must think the matter through again. I shall get back to you as soon as we have been able to do so.

Finally, I want to express my personal regret that this situation should have arisen, especially in view of your hospitality to the Einstein project over the past several years. The Institute has already contributed greatly, and I want you to understand how much we appreciate that.

Sincerely yours,



Herbert S. Bailey, Jr.

/ba

cc. Prof. Clagett
Prof. Dyson

THE INSTITUTE FOR ADVANCED STUDY

HARRY WOOLF
Director

June 11, 1982

Mr. Herbert S. Bailey, Jr.
Princeton University Press
41 William Street
Princeton, New Jersey 08540


Dear Herb:

Your letter of 6 May 1982 has left me, to say the least, with a most uncomfortable feeling. The Institute for Advanced Study at great expense, considerably beyond \$100,000, has remodeled and completely equipped a building dedicated to the Einstein Editorial Project. It was done on the simple, direct, understanding that the Project would rent the space and, indeed, you participated in the process and agreed to the rentals established.

The editor and those who are to work with and for him were hired by you and the Project, and at no time, ever, was there any understanding, direct or indirect, that academic membership in the Institute would be granted to the participants in the Project. That appointment procedure is a Faculty process and must be initiated and follow a series of steps according to the established norms of the Institute's life. However, within the matrix of the Institute there are always scholars interested in the character, growth, and development of modern physics, and I have always felt that the presence of the Project at the Institute is not only appropriate for historical reasons, but because those interests, that is, that of editing the papers and the internal intellectual concerns of our community, would find occasional, if not frequent, grounds for common stimulation. Equally, I informed you as a courtesy, that I had asked Professors Dyson and Clagett to be representatives for the Faculty in overseeing the presence of the Project here, and indeed to represent an academic liaison to the Institute.

If, as your letter implies, this is an unsatisfactory relationship, then by all means remove the editorial effort from this campus and house it either at the University or the Press, or wherever may be appropriate.

Sincerely yours,


Harry Woolf

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY 08540

Telephone 609-734-8000

SCHOOL OF NATURAL SCIENCES

June 9, 1982

Harry Wolf, Director
I.A.S.

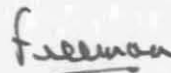
Dear Harry:

Thank you for sending me your revised letter to Bailey. I agree with the substance of what you say, and I object only to the last sentence which seems unnecessarily sharp. My understanding of Bailey's letter is that he is not engaged in jurisdictional jockeying but genuinely wants to know whether there is any serious interest at the Institute in having as members a few historians or scientists who would interact with the Einstein Project. This is a question which deserves an answer. I do not know what the answer is.

The way I would prefer to not answer Bailey's question would be to say that we cannot know what the answer will be until the project has been running for a year or two and we see whether it in fact attracts applicants for Institute membership of a calibre we find interesting. In other words, the project will have to prove itself by the quality of the people it attracts. As a practical matter, the school of natural sciences has no interest in "Philosophers of Science," and so the people attracted to the project and of interest to us are likely to be historians.

Thank you also for the other communication which came yesterday.

Yours sincerely,



Freeman Dyson

pb

c.c. Professor Clagett, IAS.

THE INSTITUTE FOR ADVANCED STUDY
Princeton, New Jersey 08540

HARRY WOOLF
Director

June 8, 1982

Professor Marshall Clagett
School of Historical Studies

Professor Freeman Dyson
School of Natural Sciences

Dear Marshall and Freeman:

I thought a more attenuated version of my earlier letter to Herb Bailey would be appropriate if we are to consider the possibility of living together, out of wedlock of course.

Unless you object, I will send a copy of the enclosed.

Thanks for your guidance.

Cordially yours,



Harry Woolf

Enclosure

THE INSTITUTE FOR ADVANCED STUDY

DRAFT

HARRY WOOLF
Director

June 7, 1982

Mr. Herbert S. Bailey, Jr.
Princeton University Press
41 William Street
Princeton, New Jersey 08540

Dear Herb:

Your letter of 6 May 1982 has left me, to say the least, with a most uncomfortable feeling. The Institute for Advanced Study at great expense, considerably beyond \$100,000, has remodeled and completely equipped a building dedicated to the Einstein Editorial Project. It was done on the simple, direct, understanding that the Project would rent the space and, indeed, you participated in the process and agreed to the rentals established.

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If, as your letter implies, this is an unsatisfactory relationship, then by all means remove the editorial effort from this campus and house it either at the University or the Press, or wherever may be appropriate. There has been enough controversy connected with the editing of the Einstein papers already and additional jurisdictional jockeying is both distasteful and unnecessary.

Sincerely yours,

Harry Woolf

June 4, 1982

Dr. Woolf:

I reminded Prof. Dyson today about your request for his comments.

Aida

Prof. Dyson responded to Dr. Woolf via telephone 7 June 1982.

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY 08540

Telephone-609-924-4400

SCHOOL OF HISTORICAL STUDIES

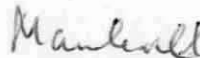
May 28, 1982

Dear Harry:

I first should note that I, too, found Bailey's letter quite distasteful, and I should not like you to soften your reply so much that its overall message is lost. Still you may want to lighten a few of your expressions. In the first paragraph you might simply express your "puzzlement, surprise and unease" at his letter (leaving out the phrase "unsavory feeling"). The second paragraph is o.k. as it is. The third paragraph is probably the most important one and however you rewrite it, you should leave the message intact. I would leave out the phrase "your provocative behavior in approaching the faculty directly." Perhaps you can reduce the first two sentences of the paragraph to something like "Needless to say, I was genuinely shocked by the sudden insertion of the threat of departure of the Project as a form of changing the existing relationship between the Institute and the Project." The rest of the paragraph is fine except that you might want to soften "abhorrent behavior" to "your letter's discourteous and threatening tone". The last paragraph is fine.

Good luck on the revision.

As ever,



Marshall Clagett

Dr. Harry Woolf,
Director
Institute for Advanced Study
Princeton, N. J. 08540

May 14, 1982

Professor Marshall Clagett
School of Historical Studies

Professor Freeman Dyson
School of Natural Sciences

Dear Marshall and Freeman:

The attached will speak for i self. I consider it a circumstance as surprising as it is unfortunate. The attached draft, so marked, was my immediate, instinctive reaction to what I consider to be almost blackmail, but perhaps in the name of ongoing and continuing life in this region I will not send it. I would like to meet with you to discuss the entire situation and the reply which should be sent to Herb Bailey.

Thank you for your help.

Sincerely yours,

Harry Woolf

THE INSTITUTE FOR ADVANCED STUDY

DRAFT

HARRY WOOLF
Director

May 12, 1982

Mr. Herbert S. Bailey, Jr.
Princeton University Press
41 William Street
Princeton, New Jersey 08540

Dear Herb:

Your letter of 6 May 1982, has left me with a most unsavory feeling and I am writing to express to you in detail not only the element of distaste with which I view its contents, but of the state of dismay with which it leaves me about the character of our relationship.

The Institute for Advanced Study at great expense, considerably beyond \$100,000, has remodeled and completely equipped a building dedicated to the Einstein Editorial Project. It was done on the simple, direct, understanding that the Project would rent the space and, indeed, you participated in the process and agreed to the rentals established. The editor and those who are to work with and for him were hired by you and the Project, and at no time, ever, was there any understanding, direct or indirect, that academic membership in the Institute would be granted to the participants in the Project. That appointment ^{process} ~~process~~ is a Faculty process and must be initiated and follow a series of steps according to the established norms of the Institute's life. However, within the matrix of the Institute there are always scholars interested in the character, growth, and development of modern physics, and I have always felt that the presence of the Project at the Institute is not only appropriate for historical reasons, but because those interests, that is, that of editing the papers and the internal intellectual concerns of our community would find occasional, if not frequent, grounds for common stimulation. Equally, I informed you as a courtesy, that I had asked Professors Dyson and Clagett to be representatives for the Faculty in overseeing the presence of the Project here, and indeed to represent an academic liaison to the Institute.

In view of the sudden insertion of the threat of departure of the Project as a form of changing the existing relationship between the Institute and the Project, and your provocative behavior in approaching the Faculty directly and of giving us first inkling of your intentions by informing Mr. Rowe, when he called to say that the offices were ready, that you were thinking of going elsewhere, a breach of both a decent business relationship and of a gentlemen's agreement that has taken place. In a word, and there are stronger words to use for this kind of action, I am genuinely shocked. I shall not speak of the courtesies already extended, the cooperation already given, the monies already spent. Nor, indeed, those that would continue in keeping with the original understanding. Equally, I shall take no further action at this time, but if

Mr. Herbert S. Bailey, Jr.

page 2

some significant explanation of what I consider to be abhorrent behavior is not forthcoming upon your return, I shall make the points I have made in this letter to the National Science Foundation, to indicate withdrawal of our participation in the Project, to the Trustees of the Princeton University Press, and to the President of the distinguished University with which you are associated.

To conclude, there was no misunderstanding on Mr. Allen Rowe's part at all, as there has not been on mine, and your letter, as you say in your last paragraph, does indeed make everything clear, for it makes visible what was not before, and I do not like what I see.

Sincerely yours,

Harry Woolf

DRAFT

Princeton University Press

41 WILLIAM STREET
PRINCETON, NEW JERSEY 08540

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ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

May 6, 1982

Dr. Harry Woolf, Director
The Institute for Advanced Study
Princeton, NJ 08540

Dear Harry,

I am leaving for England for a week (back in the office on May 14) but I wanted to get this note off to you before I go. This morning Allen Rowe called Bill Becker, our associate director and controller, to ask when the Einstein project was moving back in. It has always been our intention and hope to move back to the Institute, but a number of questions concerning the relation of the Institute to the project have been left unsettled, and I think they ought to be settled before the project moves back. This has been the subject of several conversations between us since last fall, and I have written twice urging you to take up the subject with the special committee you appointed. During the recent difficult period the Institute has been generous in supplying space for John Stachel and his secretary, and I don't want you to think that is not appreciated. The Institute remains our first choice as a location for the project, but as I have said before, and as John Stachel has emphasized from the beginning, the institutional relationship is important. You will recall our discussion with Aaron Lemonick about the idea of an Einstein studies center, or something like that, so that there would be a group of interested scholars, not necessarily employed by the project but working on related subjects, providing intellectual stimulation and occasional direct contributions. That idea has apparently been abandoned. The institutional relationship would also be important in the appointment of associate editors and the like. I realize that this is a complex question at the Institute, but your most recent letter to me seemed to say that the only possible relationship was that of a mere tenant. You may recall that at the reception for Queen Beatrix you told me that the accommodations for the project were nearly completed, and I again said to you that I hoped you would soon be able to answer these other questions.

In view of what both John and I perceived as a lessening of interest in the project at the Institute, we have been thinking



Dr. Harry Woolf
Page 2
May 6, 1982

about other possibilities. The question remains of John's status on long-term leave from Boston University, and of course that is entirely dependent on the university authorities. I have every reason to believe that the people at Boston will be cooperative, but in these uncertain times one cannot be sure.

As you know, I have all along been engaged in raising funds to support the project, and this effort has been greatly hampered by the dispute with the Estate. That is now settled, but at the moment we have funds only through November (except for the endowment supporting the editorship), and much depends on the response of the National Science Foundation and other possible sources. If you have any ideas that would be helpful in that regard, I should be most appreciative.

Apparently, at least so far as Allen Rowe is concerned, there has been some misunderstanding. If so, I hope that this letter makes everything clear. I shall look forward to talking with you further when I return from my short trip abroad.

With best wishes,

Sincerely,


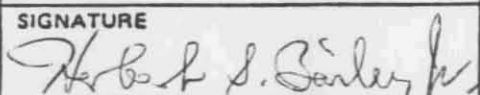


Herbert S. Bailey, Jr.

/ba

Typo 1982

**PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION
 Cover Page**

FOR CONSIDERATION BY NSF ORGANIZATIONAL UNIT (Indicate the most specific unit known, i.e. program, division, etc.) Division of History and Philosophy of Science		IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? Yes ___ No <u>X</u> ; IF YES, LIST ACRONYM(S):		
PROGRAM ANNOUNCEMENT/SOLICITATION NO.:		CLOSING DATE (IF ANY):		
NAME OF SUBMITTING ORGANIZATION TO WHICH AWARD SHOULD BE MADE (INCLUDE BRANCH/CAMPUS/OTHER COMPONENTS)				
PRINCETON UNIVERSITY PRESS				
ADDRESS OF ORGANIZATION (INCLUDE ZIP CODE)				
41 William Street, Princeton, NJ 08540				
TITLE OF PROPOSED PROJECT				
"The Collected Papers and Correspondence of Albert Einstein"				
REQUESTED AMOUNT		PROPOSED DURATION		DESIRED STARTING DATE
\$1,423,300		5 years		November 1, 1982
PI/PD DEPARTMENT		PI/PD ORGANIZATION		PI/PD PHONE NO.
Einstein Office		Princeton University Press		(609) 452-5407
PI/PD NAME		SOCIAL SECURITY NO.*	DATE OF HIGHEST DEGREE ACHIEVED	MALE* FEMALE*
JOHN STACHEL		123-26-9891	Ph.D. 1961	X
ADDITIONAL PI/PD & SIGNATURE				
ADDITIONAL PI/PD & SIGNATURE				
ADDITIONAL PI/PD & SIGNATURE				
ADDITIONAL PI/PD & SIGNATURE				
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<input type="checkbox"/> Endangered Species		<input type="checkbox"/> Marine Mammal Protection		<input type="checkbox"/> Research Involving Recombinant DNA Molecules
<input type="checkbox"/> Historical Sites		<input type="checkbox"/> Pollution Control		<input type="checkbox"/> Proprietary and Privileged Information
PRINCIPAL INVESTIGATOR/ PROJECT DIRECTOR		AUTHORIZED ORGANIZATIONAL REP.		OTHER ENDORSEMENT (optional)
NAME		NAME		NAME
JOHN STACHEL		HERBERT W. BAILEY, Jr.		
SIGNATURE		SIGNATURE		SIGNATURE
				
TITLE		TITLE		TITLE
Editor, Einstein Papers		Director, Princeton University Press		
DATE		DATE		DATE
July 6, 1982		July 6, 1982		

**NOTICE OF RESEARCH PROJECT
SCIENCE INFORMATION EXCHANGE
SMITHSONIAN INSTITUTION
NATIONAL SCIENCE FOUNDATION
PROJECT SUMMARY**

SIE PROJECT NO.

NSF AWARD NO.

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DIRECTORATE/DIVISION	PROGRAM OR SECTION	PROPOSAL NO.	F.Y.
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NAME OF INSTITUTION (INCLUDE BRANCH/CAMPUS AND SCHOOL OR DIVISION)

PRINCETON UNIVERSITY PRESS.

ADDRESS (INCLUDE DEPARTMENT)

41 William Street
Princeton, NJ 08540

PRINCIPAL INVESTIGATOR(S)

JOHN STACHEL

TITLE OF PROJECT

THE COLLECTED PAPERS AND CORRESPONDENCE OF ALBERT EINSTEIN

TECHNICAL ABSTRACT (LIMIT TO 22 PICA OR 18 ELITE TYPEWRITTEN LINES)

The Collected Papers and Correspondence of Albert Einstein will be a printed edition of his writings and correspondence, published by Princeton University Press and edited by Dr. John Stachel. Documents will be arranged chronologically in two series, Papers and Correspondence. They will be printed in their original languages, primarily German, and annotated in English. This five-year grant request is for funding of the editorial work on the period from Einstein's birth (1879) until his move to Berlin (1914). The first volume will cover his Student Years up to 1900; the remaining four volumes will cover the Swiss Years during which he worked at the Swiss Patent Office and the Universities of Zürich, Prague and the Federal Institute of Technology (ETH). Many of his most important scientific papers were published during this period, including his fundamental work on statistical mechanics, special relativity, quantum theory, and a decisive advance in his search for a general theory of relativity. His notebooks, correspondence and other documents will add new insights into the development of his ideas and their growing influence during this crucial period in his life.

1. Proposal Folder
2. Program Suspense
3. Division of Grants & Contracts
4. Science Information Exchange
5. Principal Investigator
6. Off. of Govt. & Pub. Progs.

PROPOSAL BUDGET				FOR NSF USE ONLY						
ORGANIZATION PRINCETON UNIVERSITY PRESS				PROPOSAL NO.		DURATION (MONTHS)				
						Proposed	Granted			
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR JOHN STACHEL				AWARD NO.						
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A.G. show number in brackets)				NSF FUNDED PERSON-MOS.		FUNDS REQUESTED BY PROPOSER		FUNDS GRANTED BY NSF (IF DIFFERENT)		
				CAL.	ACAD.	SUMR.				
1. JOHN STACHEL, EDITOR				0			\$		\$	
2. ASSOCIATE EDITOR				60			269,400			
3. (2) ASSISTANT EDITORS				120			359,100			
4.										
5. () OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)										
6. () TOTAL SENIOR PERSONNEL (1-5)										
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)										
1. () POST DOCTORAL ASSOCIATES										
2. (1) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				60			107,700			
3. () GRADUATE STUDENTS										
4. () UNDERGRADUATE STUDENTS										
5. () SECRETARIAL-CLERICAL										
6. () OTHER										
TOTAL SALARIES AND WAGES (A+B)							736,200			
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)							147,300			
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)							883,500			
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$1,000; ITEMS OVER \$10,000 REQUIRE CERTIFICATION)										
WORD PROCESSING SYSTEM							60,000			
5 FIRE-PROOF FILE CABINETS							5,000			
TOTAL PERMANENT EQUIPMENT							65,000			
E. TRAVEL 1. DOMESTIC (INCL CANADA AND U.S. POSSESSIONS)							9,600			
2. FOREIGN							10,000			
F. PARTICIPANT SUPPORT COSTS										
1. STIPENDS \$ _____										
2. TRAVEL _____										
3. SUBSISTENCE _____										
4. OTHER _____										
TOTAL PARTICIPANT COSTS										
G. OTHER DIRECT COSTS										
1. MATERIALS AND SUPPLIES							34,400			
2. PUBLICATION COSTS/PAGE CHARGES										
3. CONSULTANT SERVICES (Editorial Committee)							27,400			
4. COMPUTER (ADPE) SERVICES							31,700			
5. SUBCONTRACTS										
6. OTHER (RENT, UTILITIES, FIRE ALARM SYSTEM)							113,200			
TOTAL OTHER DIRECT COSTS							206,700			
H. TOTAL DIRECT COSTS (A THROUGH G)							1,174,800			
I. INDIRECT COSTS (SPECIFY)										
TOTAL INDIRECT COSTS							248,500			
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)							1,423,300			
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS GPM 252 AND 253)										
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)							\$ 1,423,300		\$	
PI/PD TYPED NAME & SIGNATURE*				DATE		FOR NSF USE ONLY				
						INDIRECT COST RATE VERIFICATION				
INST. REP. TYPED NAME & SIGNATURE*				DATE		Date Checked		Date of Rate Sheet		Initials - DGC

THE COLLECTED PAPERS AND CORRESPONDENCE OF ALBERT EINSTEIN
RESEARCH GRANT PROPOSAL TO THE N.S.F.

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INTRODUCTION

This proposal is a request for a grant of \$1,423,300 from the National Science Foundation to support editorial work on The Collected Papers and Correspondence of Albert Einstein (hereafter denoted Einstein Papers) for the five-year period: November 1, 1982-October 31, 1987. The Einstein Papers will be a printed edition of the collected writings, published and unpublished, as well as the correspondence of Albert Einstein in about twenty volumes. The material to be edited during the period of this grant request covers the years from Einstein's birth (1879) to his move to Berlin on the eve of the first World War (April 1914), in about five volumes.

Einstein's life span (1879-1955) encompassed several major changes in the physical sciences. These included the development of statistical mechanics, the creation of the special and general theories of relativity and the birth of the quantum theory culminating in the formulation of quantum mechanics. Einstein's role in all of these changes was central, in many it was pre-eminent.

The volumes to be edited during the period of this grant request cover: Einstein's education; his work in almost complete isolation from the scientific community in the years before 1905 during which he elaborated his seminal ideas in the fields of statistical mechanics, special relativity, and quantum theory; his gradually growing reputation in the physics community, culminating in the offer of a unique full-time research position in Berlin; his move from Swiss Patent Office clerk in Berne to an academic career in Zürich and Prague. Many of his most important scientific papers were published during this period, which ended with a decisive breakthrough in his quest for a general theory of relativity. Correspondence, notebooks, and conference contributions from this period add many new insights into the development of his scientific ideas as reflected in the published papers.

His contributions, both constructive and critical are universally acknowledged to have made him the leading theoretical physicist of his era. His work is still the object of intense interest for physicists, philosophers and historians of science. Work on the general theory of relativity and the ensuing search for a unified field theory gave a powerful impetus to the development of modern differential geometry. His work is thus of importance to mathematicians and historians of mathematics. The need for a complete printed edition of Einstein's

300 published and unpublished scientific writings has been widely felt since his death. [1] The vast majority of his correspondence still remains unpublished. The published portion has appeared in varying formats, often only in excerpts, with texts of varying degrees of authenticity and level of annotation not always in easily accessible sources. [2] The present edition of the Einstein Papers will answer this need and remedy these defects by making available to the scholarly community authenticated texts of Einstein's writings and correspondence in a uniform edition in their original language with annotations in English.

This edition clearly will be of major interest to many physicists, mathematicians, philosophers and historians of science, as well as psychologists interested in the creative process in science. But it will contain material of importance to a much larger scholarly public. The outbreak of World War II prompted Einstein's first public pronouncements on social and political questions as well as the first private comments of which there is any record. From that time on, and especially after he attained world-wide fame in 1919, Einstein was increasingly called upon--or himself felt impelled--to speak out publicly, on many current issues: His views on such topics as pacifism, disarmament, nuclear weapons, racism, anti-Semitism, Zionism, Jewish-Arab relations, socialism, fascism, communism, civil liberties, religion, education--to give just a partial list--were elicited in well over 400 published articles and interviews. His ever-growing correspondence, while continuing to contain much of great scientific interest, also came to reflect his social concerns. In thousands of letters he exchanged views with a large number of prominent public figures, as well as thoughtfully replying to questions from other correspondents attracted by his magic name. Only a fraction of these published articles have been reprinted in currently accessible form, [3] while most of the correspondence on these questions remains unpublished. Thus, this edition will be of value to many social and political historians, especially those working on modern German or American history, the pacifist and Zionist movements, disarmament, the League of Nations; as well as to educational theorists, theologians, social philosophers--to name a few fields that immediately come to mind.

Undoubtedly there is a much larger audience in this country interested in having access to a selection of the material in the Einstein Papers. Work on this scholarly edition is an important first step in making the Einstein heritage more accessible to this broader public. Once work on the initial volume of the Einstein Papers has been finished (by the end of 1983), detailed planning of a selected three- or four-volume edition in English will begin. This constitutes a separate project, for

which funding is not being requested, but it may be appropriate to add a few words about it. A tentative table of contents has already been drawn up for a volume of selected scientific papers, intended primarily for students and others with an interest in physics, mathematics, history and philosophy of science and related fields. Over half of the contents of this volume have never appeared in English. A volume of selected non-scientific papers will also be prepared. The current availability of such selections in English will be taken into account in planning this volume.[4] Such a volume is intended for the general public, as are one or two volumes of selected correspondence, to consist of letters most of which have never appeared in English translation.

None of the existing biographies of Einstein, whatever their merits, meets the often felt need for a large-scale, accurate biography. The Einstein Papers will provide material indispensable for writing such a biography, as well as innumerable more specialized monographs and articles.

[1] A Japanese edition of Einstein's published scientific papers up to that date was published in 1923. Russian and Chinese editions of his published scientific papers have been published since his death. A facsimile microprint edition which includes almost all of his published scientific writings was issued in 1960: Albert Einstein, Collected Writings (1901-1956) (New York: Readex Microprint Corporation, 1960).

[2] Einstein's correspondence with Michele Besso, Max Born, Elie Cartan, and Arnold Sommerfeld have been published in book form, with some omissions in each of them. His letters to Maurice Solovine have been published in a facsimile edition, without Solovine's letters. Other letters or excerpts have appeared in various books and periodicals.

[3] Volumes consisting of Einstein's non-scientific writings in English include: About Zionism, The World As I See It, Out of My Later Years, Ideas and Opinions, and Einstein on Peace. The latter volume also contains many letters on social and political topics.

[4] Of the volumes listed in the previous note, only Ideas and Opinions and Einstein on Peace are readily available.

HISTORY AND GOVERNANCE OF THE PROJECT

In 1971 the Trustees of the Einstein Estate (hereafter denoted Estate) and the Princeton University Press (hereafter denoted Press) signed a Memorandum of Agreement jointly to sponsor the preparation of the Einstein Papers for publication by the Press (copy appended). They envisaged a complete, letterpress edition of the works of Albert Einstein, published and unpublished, including his correspondence, as well as such other documents and editorial material as were deemed important for the understanding of these writings.

An Editorial Advisory Board was established, with members appointed jointly by the Estate and the Press, to assist in assuring the scholarly quality of the edition (current membership list appended). This Board has been consulted on such questions as the appointment of the Editor and guidelines for the plan of the edition and the editorial method. It will be consulted in future on such questions of general policy.

In June, 1976 Dr. John Stachel was appointed Editor of the Einstein Papers (vita appended). He started work in January, 1977 in an office at the Institute for Advanced Study (hereafter denoted Institute). Differences soon arose between the Estate and the Press over the editorship which impeded work on editing the Einstein Papers for some time. Pending resolution of these differences, Dr. Stachel prepared a complete full-size duplicate of the Einstein Archive for use in the editorial work and conformed it with the originals. He also prepared a computerized Control Index to the 43,000 documents in the Archive and wrote A Guide to the Duplicate Einstein Archive and Control Index. A second full-size duplicate of the Archive has been made and placed in Seeley G. Mudd Library on the campus of Princeton University, together with a copy of the Control Index and Guide, for the use of scholars. This work was supported by grants from the NSF and the Sloan Foundation.

Dr. Stachel signed a Contract with the Press in September, 1981 setting forth the terms of the editorship (copy appended). An editorial office (hereafter denoted Einstein Office) was set up in the Press Building where the editorial duplicate copy of the Einstein Archive has been placed. Discussions are under way between the Press and the Institute on the possibility of permanently housing the Einstein Office at the Institute. Pending the availability of funding for the appointment of a permanent staff, Dr. Robert Schulmann, a modern German historian with previous experience in documentary editing, has been appointed to the temporary position of Staff Historian (vita appended). Mrs. Olga Griminger has been appointed a part-time

Editorial Assistant (vita appended). Both are completely bilingual in German and English. Work was started on the transcription of manuscript documents and the annotation of texts. All of the manuscript documents for the first volume have been transcribed and are being annotated. Transcription of documents for the next few volumes is well under way.

At the end of 1981 the Estate transferred all of its physical and literary property to the Hebrew University of Jerusalem. A Publishing Agreement Assignment transferred all rights and obligations of the Estate under its Memorandum of Agreement with the Press to the Hebrew University. The Press and the Hebrew University have worked out a supplementary agreement, confirming their joint sponsorship of the Papers. Under this agreement, currently awaiting signature, the Hebrew University assumes all the rights and obligations of the Estate except that of raising money for the Einstein Papers.

In February of this year Miss Helen Dukas, long-time Secretary to Professor Einstein and Archivist of the Einstein Archive since his death, passed away. Her loss will be keenly felt by a generation of Einstein scholars, including the Editor, who had come to rely on her intimate knowledge of the Archive.

Editorial work is currently being funded by three sources:

1) Mr. Harold W. McGraw has given an endowment of almost \$1,000,000 to the Press, the income from which will be used to pay the Editor's salary and fringe benefits until completion of the Einstein Papers.

2) The Alfred P. Sloan Foundation has provided a series of short-term grants over the last four years. The latest of these, for \$120,000, was used to cover all other expenses of the project from May 1, 1981 until April 30, 1982, including the salaries of Dr. Schulmann and Mrs. Griminger.

3) The Princeton University Press Trustees have authorized the expenditure of \$34,000 in Press funds to cover these other expenses from May 1, 1982 until October 31, 1982.

Ultimate responsibility for the Einstein Papers project now resides in the Press and the Hebrew University, which share this responsibility in all matters except financial ones, for which the Press has assumed sole responsibility. The Editorial Advisory Board continues to function in an advisory capacity to both of them. The Editor is responsible to the Press and Hebrew University for the editorial work, the management of the Einstein Office and the selection of the permanent staff. The appointment of Assistant and Associate Editors is subject to approval of the

Press and Hebrew University. The Editor's contract guarantees the staff normal editorial freedom in their work. The Editor is required to submit an annual report to the Press, Hebrew University, and the Editorial Advisory Board on the progress of the work and plans for the coming year.

Under his contract, the Editor is mandated to set up a small Editorial Committee to work closely with him and the permanent staff on detailed formulation of editorial policy, as well as to provide expert advice in a variety of fields needed for the editorial work (see the next section on Editorial Committee).

Once the editorial structure has been set up, the work of the permanent staff will be supervised by the Editorial Committee, as well by the Hebrew University and Press with the advice of the Editorial Advisory Board. They will all review the final manuscript of each volume before publication.

THE EDITORIAL COMMITTEE

The Editorial Committee will consist of a group of about half a dozen people with expert knowledge in areas of particular importance to the editorial work. It is to consult with the permanent staff, providing advice on editorial plans as well as specialized problems arising in the course of the editorial work, and will review the final manuscript of each volume. Its membership may change as the work proceeds from one phase to another. For example, it is important in the early stage of the work to get regular advice on questions of editorial method from someone with experience on a major documentary editing project; such advice will be needed less frequently later on. When the editorial work reaches the period of the First World War when Einstein started to write and correspond on political and social issues, advice will be needed from historians familiar with the pacifist movement, the Weimar period, the Zionist movement, the New Deal period, etc.

For the period of Einstein's career covered by this grant proposal (1879-1914), the Committee should include experts in the following areas:

- editorial work on a major documentary editing project;
- history of science, especially late nineteenth- and early twentieth-century physics, both internal and external aspects;
- theoretical physics, especially statistical physics, relativity theory and quantum theory;
- philosophy of science, especially the philosophy of physics and the early positivist movement.

Persons with expertise in one or more of these areas who have also worked on Einstein are especially desirable, of course. To give some idea of the caliber of the people to be asked, the following names are mentioned:

Documentary Editors: Nathan Reingold, Arthur Link, Mary Jo Kline

Historians of Science: Russell McCormmach, Paul Forman, Martin Klein, Gerald Holton

Physicists: Peter Bergmann, Abraham Pais, Valentine Bargmann

Philosophers of Science: Adolf Grünbaum, Robert S. Cohen, Carl Hempel

It is planned to convene the Committee as a whole several times a year in the early stages of the work, and thereafter at least once a year. Consultation with individual members will be done by telephone or mail when possible. But the need for some more extended contacts is anticipated, which may necessitate travel by Committee members or staff persons.

PLAN OF THE EDITION

The aim of this edition of the Einstein Papers is to provide full documentation of Einstein's thought and activities through his own writings and correspondence, as well as a limited number of third-party documents which shed significant light on his activities. The edition is intended for a scholarly audience drawn from a variety of fields, as noted in the Introduction. Four broad questions must be addressed in the planning of such an edition: the selection of the documents to be included, the arrangement of these documents, the question of translation, and the editorial method to be applied. The last point will be discussed in the next section.

Selection of documents: it seems clear to the Editor that scholars will want to have all of Einstein's published writings available in a uniform edition. All of the unpublished Einstein manuscripts of which the Editor is aware--and there are only about a score--are of sufficient interest to merit inclusion. Only a handful of Einstein's notebooks have been preserved. Two consist of notes on the physics course he took at the Eidgenössische Technische Hochschule (hereafter denoted ETH) or Swiss Federal Institute of Technology, which give valuable insight into his education. The remaining notebooks consist of notes for his own university lecture courses and research notes. The former give some insight into his teaching methods; the latter give a unique insight into his research process. All of the notebooks will therefore be included. Written records of oral remarks by Einstein, such as questions or comments at scientific meetings and accounts of lectures, speeches, or interviews, will be included if there is reason to believe they are substantially authentic. During the conforming process, the editor found that the correspondence seems to contain very few trivial letters by Einstein (for example, repeated copies of the same letter of recommendation addressed to different people). So the basic principle will be to include all letters by Einstein, except for the few that fall into the trivial or repetitive category. These will, however, be calendared. For the early period of Einstein's life covered by this grant proposal, the problem hardly arises. We only wish more of Einstein's early letters had been preserved! Letters known to have been written but presently unobtainable will also be calendared.

Letters to Einstein will be handled more selectively. Later in life, after he became famous, he often received lengthy letters or documents to which there is no reply or even evidence that he read them. Such documents will be calendared but omitted. In some cases, a lengthy document may receive a brief, possibly formal reply. Such a document will be abstracted to the extent necessary to make the reply intelligible. In other cases, it may be impossible to

obtain permission from the copyright holder to print what otherwise merits inclusion. In that case a letter summary will have to replace the original. All significant letters to Einstein for which permission to publish can be obtained will be included. Comparatively few of the letters addressed to Einstein in the early years before he had secretarial help have been preserved. Those he kept were not generally trivial, so very few problems of selection arise for letters to Einstein from the period covered by the grant proposal.

Third-party documents will be included very selectively. One group which merits consideration for publication is the lecture notes of Einstein's courses at the ETH in 1912-14 and at the University of Berlin in 1916-18. Both note-takers (Walter Daellenbach and Werner Bloch) were physics students close to Einstein, and their notes give a full picture of Einstein's courses. Their contents will be checked against Einstein's own lecture notes from the period, and those portions that do not overlap will be included in the Einstein Papers.

Letters not addressed to Einstein but which contribute significant information about him will also be included. An example is letters by members of the Einstein family, some of which are currently available to the Einstein Papers project. Documents about Einstein's career or activities that significantly help to place him in his milieu will also be considered for inclusion. For example, the report of the Dean of the Faculty of Philosophy at the University of Zürich recommending Einstein's initial appointment gives a unique insight into how Einstein was perceived, especially as a Jew, in Swiss academic circles in the first decade of this century. Some documents of this type will be printed in full, other excerpted, or abstracted, and some merely calendared. It is hard to give precise criteria for such distinctions except to say that the aim will be to preserve all significant information about Einstein they contain and give it a readable form.

For the early period covered by this grant proposal, the amount of such documentary material is not large. Only a few dozen documents have been uncovered so far, and further search is not likely to increase the number by a large amount.

Arrangement: The best way to realize the aim of this edition--documentation of the development of Einstein's ideas and activities--is to arrange the documents chronologically. Unless letters were to be artificially subdivided, it is hard to imagine any other principle on which the correspondence could be ordered. Besides, chronological sequence of the letters best brings out the unity of Einstein's activities, the development of his ideas, and the growth of his contacts. Third-party documents relating to Einstein's career also take their place naturally in such a chronological sequence.

Current documentary editing practice in this country favors printing all documents in strict chronological sequence, and there is much to be said for doing so. We have decided in favor of a modification that we feel will yield several practical advantages. All of the material will be edited as a whole with numerous cross references between papers and correspondence. However, they will be printed in two correlated series of volumes:

1) The first series will include all of Einstein's published papers, unpublished manuscripts, notebooks, records of his comments at scientific meetings, lectures, speeches and interviews. This series will be referred to as Papers.

2) The second series will include his correspondence, third party letters and other documents. However, all documents printed in the first series will be calendared at the appropriate point in the chronological sequence of the second series. This second series will be referred to as Correspondence.

This system has the following advantages: Publishing the letters separately will make it easy for a reader to follow the flow of the correspondence without interruption. The reader who wishes to follow a strictly chronological sequence need only use the second series as a starting point, turning to the first series where the text indicates this is appropriate. Readers who wish to follow the flow of the papers without interruption will not have the encumbrance of interspersed letters; they will not miss letters directly relevant to a given paper if they wish to refer to them, since they will be indicated in the annotations to that paper. Those who wish to buy the correspondence separately will be able to do so, as will those who are interested only in the published papers. It is true that the division will cause some inconvenience to the reader who has to turn from one volume to another; but such inconvenience cannot be completely avoided in any multi-volume work. Many readers may find that the possibility of consulting a relevant letter side by side with a related paper makes up for this inconvenience.

A further possibility would be to subdivide the first series of Papers into Scientific Papers and Non-Scientific Papers. Some physicists and historians of science undoubtedly favor such a division, since it would make available separately the papers directly

relevant to their work. The same might be said by those scholars not interested in the scientific papers. However, if one tries to decide where to make the division in Einstein's writings, it becomes clear that this is not a trivial problem. Einstein wrote a number of clearly technical papers in physics. He also wrote a number of articles with no scientific content. But in between there is almost a continuum of writings which are potentially of interest to scholars in both the natural sciences and in non-scientific fields. Two of his books on relativity^[1] and many semi-technical and popular articles explaining the special and general theories and unified field theory, and his Autobiographical Notes fall into this category. So do a number of philosophical essays making varying demands on the technical knowledge of the reader, essays on such figures as Newton, Kepler and Maxwell, and popular scientific articles on such topics as the meander of rivers, aerodynamical lift and the mass-energy equivalence relation. The question of a division between scientific and non-scientific writings requires further thought and discussion by the permanent staff, Editorial Committee and Editorial Advisory Board before a final decision is reached.

Fortunately, postponement of this decision will not impede work during the period of this grant request. There are no non-scientific published papers by Einstein from the period before his move to Berlin. The only unpublished non-technical writings preserved are some school essays, which will be included in the first volume, containing all documents from his student years.

Question of translation: Einstein's primary language was German, as was that of many of his most important correspondents. He was never at home in English, even after his move to this country, and always reverted to German when he felt it important to express himself precisely. Thus, all of his manuscripts were written in German, and the large majority were first published in that language. Almost all of his letters were written in German, although English translations were often sent after he moved to this country. It is most important that Einstein's texts be given in their original language, whenever available, and that this text be the basis for annotation. However, a few early papers exist only in the published French translation, and a number of papers published after his move to the United States were first published in English. A small fraction of letters to Einstein are in French, a few letters are in Italian, Spanish and Russian. The only record of Einstein's lectures in Japan is in Japanese. How will this variety of languages be handled?

The principle adopted is that the best available text in the original language will be the basis of the published text. All articles and letters by Einstein for which a German draft exists will be given in German. This will be followed by the English text of papers first published in an authorized English translation, or the English letter actually sent, if such exists. All texts in languages other than English or German will be followed by an English translation.

Ideally, German texts would also be followed by English translations. However, if they were so handled, the resultant practical difficulties would delay the project and increase its cost to a significant extent without a commensurate gain in readership. If translations of all of Einstein's texts were to be given in the Einstein Papers, they would thereby be granted a degree of authority which would require that they be prepared and checked with the greatest care. This is no simple matter as the many faulty current translations demonstrate. It would probably at least double the time required for the production of each volume if it were to be done by the permanent staff. Even if outside translators were employed to speed up the process, the Editor's previous experience with editing translations indicates that checking and revising the translations would still require a great deal of additional time, to say nothing of expense. Even if such translations were printed in smaller type, they would still add significantly to the bulk and cost- of each volume; or more probably would require an increase in the total number of volumes. For the period covered by this grant request, for example, everything would have to be translated anew, or copyrights secured for existing translations which are often defective and in need of extensive revision if they were to be used. The inclusion of translations of all French items, on the other hand, involves about seventy pages of material for the entire period.

Against these heavy expenditures of time and money what gains could be expected? The publisher expects the edition to be sold primarily to libraries and those Einstein scholars around the world who will need to refer to it constantly. These scholars must be presumed to know German, as must historians and philosophers of science working on this period. Since inclusion of translations will not turn a scholarly edition into a popular one, the publisher does not anticipate significantly greater sales to the general public or even to libraries if translations are included. There remains the advantage to non German-reading scholars who want to use the Einstein Papers for research on some specific question. Such scholars are presumably familiar with the problem of needing to use specific items in an unfamiliar language, and will cope with it as they have always done: by getting the help - formal or informal - of someone who knows the language. At least they will have all of the relevant texts in a uniform, authenticated edition at their disposal, with annotations and indices in English to help them locate what they need. We do not feel the advantage of meeting such needs outweighs the heavy practical difficulties that the inclusion of translations of German documents would create.

Much of the material in this edition will clearly be of interest to a larger audience. But practical difficulties seem to rule out a complete English edition. As mentioned in the Introduction, a selected

English edition should and will be prepared by Princeton University Press to meet this public interest. The Einstein Papers project will benefit the larger community by providing the basis for this selected edition as well as the source material on which reliable popular books and articles on Einstein and related topics can be based.

[1] Relativity: The Special and General Theory, and The Evolution of Physics (written with Leopold Infeld).

EDITORIAL METHOD AND APPARATUS

Four questions will be discussed here: The establishment of the text, transcription, annotation, and the editorial apparatus.

Establishment of the Text: In the case of letters and other non-printed material we shall always endeavor to work from a photocopy of the original document. Only if this cannot be obtained will we use a printed version of the text. If more than one printed version is available, we shall try to find the one which appears to conform most closely to the known peculiarities of the author's orthography, punctuation, etc.

In the case of a printed document, we shall use the first published version in the original language as the basis of our text, footnoting changes in subsequent editions published during his lifetime in the case of Einstein's writings. If there is a manuscript version of a printed document, it will be used as the basis for correcting errors of spelling, punctuation, formulae, etc. in the printed text. If there is no manuscript version, errors will be allowed to stand in the text and will be corrected in footnotes. Significant differences between manuscript and printed texts will be indicated in footnotes if they consist of changes in what is basically the same text. Otherwise, the manuscript will be printed as a separate document preceding the printed version. If the first printed version was in a language other than German, but it can be established that a later printed German version represents the original text and not a translation (as we have been able to do, for example, in the case of Einstein's contributions at the first Solvay Congress in 1911), the German text will be printed. Only if no authenticated German version of an Einstein text exists will a published translation be used as the basis of our text. As noted in the section on the Plan of the Edition, if an authorized English translation was the first published version it will also be printed.

Transcription: The aim of our transcriptions of manuscript documents is faithfulness to the original. The method used for the initial transcription of such documents is described in the appended Initial Transcription Procedure, which lists the few departures from literalness. After being prepared by a bilingual member of the staff, the transcription is read against the original document by another bilingual staff member and finally by the Editor. Points which still remain obscure after these readings are noted for later comparison with the original of the document.

Certain changes are made in the initial transcription in converting it into the final form in which it will be printed. Missing letters in uncommon or unclear abbreviations are supplied in the text within square brackets. A decision is made on whether to remove a cancellation from the text on the grounds of its insignificance. An interlineation is brought down to the line without comment, except for rare cases where there is reason to believe that it represents a significantly later afterthought. In the latter case, a footnote will indicate the interlineation and the grounds for the belief. Words or sentences marked by the author in the text for insertion, but physically placed elsewhere on the page, are inserted in the text with a footnote indicating the original placement, unless it is felt that significant information may thereby be lost. In this case, the original placement is preserved as in research notebooks, for example. Diagrams are placed in the text as close to the original arrangement as the layout of the printed page will allow.

Annotation: The documents in the Einstein Papers speak for themselves, but even the specialist will sometimes need help in understanding what they say. The aim in annotation is to be as concise as possible in making the texts accessible to the reader. Most obviously, specific references to people, places, organizations, and events familiar to the writer and intended audience of a document often need explanation for a contemporary reader. The information contained in such annotations will be kept to a minimum by providing only what is immediately needed for understanding the particular reference in the text. Fuller information will be provided in a biographical appendix to each volume of the Correspondence about significant figures in Einstein's life, such as Marcel Grossmann, Michele Besso, Jakob Ehrat--all close friends of the young Einstein. References to the extensive literature on Einstein and related topics will be kept to the necessary minimum in the notes (a full bibliography of such material will be issued as a separate by-product of the editorial work).

Annotation will also attempt to give contemporary readers an indispensable minimum of more general background information--scientific, historical, philosophical, political, cultural, etc.--needed for understanding the context and significance of certain documents. This may sometimes take the form of headnotes serving to indicate the nature and origins of some common theme linking a group of documents. We will also give extensive cross-referencing, e.g., between a published paper and related correspondence, in the notes.

Since we shall be presenting a faithful text, annotation of errors, omissions, doubtful readings, and other textual problems will also be necessary where they might prove confusing to the reader.

Editorial Apparatus: Documents within each series (Papers and Correspondence) will be printed in chronological sequence. If no definite date can be assigned to a document, its place in the sequence is determined by the beginning of the shortest unit of time (week, month, year, decade, etc.) to which it can definitely be assigned. For documents with which more than one date may be associated, the earliest such date will govern its position (e.g., a copy of a letter from Einstein enclosed in a later letter to Einstein). Undated enclosures will be printed after the document in which they were enclosed. The titles and dates of documents in the Papers will be calendared at the appropriate place in the chronological sequence of the Correspondence, as will be letters known to exist of which no copy is available. Manuscripts known to exist but unavailable will similarly be calendared at the appropriate place in the chronological sequence of the Papers.

Every document will be preceded by a title in capital letters, placed flush left. If a non-letter does not have a title it will be given one. Reference to Einstein's authorship in a title is deleted, unless there is more than one author. Letters will be given the standard title of "FROM.... TO....," except that Einstein's name will always be omitted (e.g., "TO WILHELM OSTWALD"). The date will be on the line following the title and placed flush right. Any information added to the date-line will be placed in square brackets. The text will then follow. The original pagination of published books and papers by Einstein is indicated in the right margin within square brackets. All original footnotes will be printed at the foot of the corresponding page.

All editorial footnotes will be indicated by Arabic numerals enclosed in square brackets and will follow the text and description of the document, unless the document is over three printed pages. In that case, editorial footnotes will be printed at the foot of the corresponding page, separated by a bar from the text and original footnotes. Descriptive symbols will directly follow the text, flush left (e.g., ALSF for Autograph letter signed, in Fraktur script). If no indication of provenance follows, the original of a non-printed document is in the Einstein Archive. Otherwise, the location of the original, if known, follows in parenthesis; if unknown, the source of the photocopy used is given. In giving provenance, symbols for documentary repositories are used, American repositories being designated by the symbols used in the Library of Congress National Union Catalogue. Comments on noteworthy general textual features of a document or address follow the information on provenance. For documents less than three printed pages, footnotes will follow.

In addition to the texts, headnotes and footnotes, the Einstein Papers will contain other editorial apparatus. The first volume will contain: an introduction, an explanation of the editorial method, and a list of descriptive symbols to be used. Each volume will contain: a table of contents (which will also serve as a calendar), a list of abbreviations used in that volume for documentary repositories, and a list of illustrations, all preceding the texts. A chronology of Einstein's life for the period covered by that volume will precede the texts of each volume of the Correspondence, which also will include a biographical appendix in the back matter. This will consist of short biographies of significant figures in Einstein's life, first mentioned in that volume, about whom this information is not readily available in English biographical dictionaries. For the period covered by this grant request we shall use the rule that persons with biographies in the Dictionary of Scientific Biography will not be included. The biographical appendix to any subsequent volume mentioning the person will include only a reference to the volume in which the biography is given. The back matter of each Correspondence volume will also include a calendar of letters arranged alphabetically by correspondent.

Every volume will include a bibliography in the back matter. This will include the author and title of all books and articles referred to more than once in the editorial matter of that volume. These will be preceded by the following abbreviated form: Author's last name, followed by year of publication, all in italics, followed by a small italic letter if more than one work by that author from that year is cited. References to these works in the editorial apparatus will be in this abbreviated form (see the Sample Texts for examples).

Every volume will also include name and subject indices. The latter will be included in both English and German. Cumulative indices will be included from time to time. In particular, the last volume of the Correspondence from the Swiss Years will include such a cumulative index.

PERMANENT STAFF

As the sections on the Plan of the Edition and the Editorial Method and Apparatus indicate, the editorial work calls for people with a number of specialized skills. All of the staff members will have to know German; those who do initial transcription of German manuscript documents must be bilingual in German and English. Some of the staff members should know French or Italian; Spanish, Russian and Japanese are desirable but not indispensable.

Editorial experience, particularly on a documentary editing project, is desirable; at least one member of the staff should have such a background. Research skills in a relevant field are an obvious requirement. For the editorial work during the period of this grant request these include: theoretical physics, history of science, philosophy of science, and modern German social and cultural history (including German-speaking Switzerland, Austria and Bohemia).

A permanent staff of five is proposed. In such a small group, a "table of organization" cannot be rigidly applied. The actual work done by each person must vary to some extent, depending on his or her individual skills and other strengths and weaknesses, as well as the varying requirements of the project as it proceeds. Thus, the following job descriptions should not be interpreted as an immutable blueprint, but an indication of the range of skills and functions to be represented on the staff.

Editor: assumes overall leadership of the entire project, and final responsibility for all decisions; major background in special and general relativity theory; good knowledge of quantum theory, and philosophical problems of modern physics. Reading knowledge of German, French, Italian and Spanish. Primary responsibility for research on annotations in the area of physics. Aid in checking transcriptions of handwritten documents.

Associate Editor: assumes a major share of the executive responsibility. Major background in the history of science, especially work in late nineteenth- and twentieth-century physics. Primary responsibility for research on annotations bearing on the history of science and preparation of indices. Aid in checking transcriptions of handwritten documents.

Assistant Editor: major background in social history, especially work in late nineteenth- and twentieth-century German history. Should be bilingual in German and English with some experience on a documentary editing project. Primary responsibility for: the initial transcription of handwritten documents, research on historical and biographical annotations, the search for new documents.

Assistant Editor: major background in physics and/or philosophy of science, particularly late nineteenth- and twentieth-century physics; a background in statistical physics especially desirable. Primary responsibility for research on annotations relating to philosophy of science. Major share in research on annotations in the area of physics. Primary responsibility for the operation of the word processing system.

Editorial Assistant: Should be bilingual in German and English. Major responsibility for operation of word processor, including secretarial duties. Major share in the initial transcription of handwritten documents.

So far, only funding for the editorship is assured. Dr. Stachel has been granted leave of absence from Boston University for his work on the Einstein Papers since 1977. Boston University has indicated its willingness to continue this arrangement, as well to have the entire project move to Boston if that ever seems desirable.

Dr. Schulmann and Mrs. Griminger have been hired on a temporary basis due to lack of permanent funding, but would like to work on the permanent staff. Dr. Schulmann would be a candidate for an Assistant Editorship and Mrs. Griminger for the Editorial Assistantship.

It is hoped that the entire permanent staff discussed here can be hired by early 1983. The schedule for completion of the volumes during the period of this grant proposal (outlined in the final section) is based on this assumption.

SEARCH FOR ADDITIONAL DOCUMENTS

Although a large amount of material has been added to the Einstein Archive in the quarter of a century since Einstein's death, the frequency with which documents are still being discovered suggests that a substantial number remain to be found. A number of letters are known to be in possession of members of the Einstein family, for example. So far efforts to obtain copies have not succeeded, but will be continued. In addition to continuing efforts to secure copies of documents known to exist but not yet in our possession, a systematic search of archives and libraries in this country and abroad to discover new documents is planned.

This search has been delayed, pending availability of an inventory of the material found by the Berkeley project on "Sources for the History of Twentieth-Century Physics", directed by Dr. Bruce Wheaton. This project undertook a major search of European and American repositories, resulting in a list of about 750,000 letters to or from about 5,500 physicists. It is pointless to undertake a broadcast inquiry now, since more specific requests can be addressed to many repositories once the inventory is available in the fall of 1982 as Dr. Wheaton has informed us it will be. However, pending its availability certain parts of our search can begin. This part of the search will initially concentrate on sources likely to have documents relevant to the early period of Einstein's life (1879-1914), in accordance with the basically chronological plan of publication (see section on Plan of the Edition). Places that will require visits include the Munich City Archive, the Aargau Cantonal School, the Archive of the Swiss Federal School Council at the ETH, the State Archives in Vienna, and the Archives of the Universities of Zurich and Prague. The documentary inventory already published for DDR archives lists a number of documents relevant to the negotiations for Einstein's move to Berlin, photocopies of which we will attempt to secure.[1]

A number of other archives known to have significant holdings of Einstein documents already have been or will be contacted by mail. In some cases, visits to archives with very extensive holdings will be necessary. Copies of a number of additional documents have already been acquired through such inquiries.

A search through earlier volumes of the Jahrbuch der Auktionspreise fllr Blcher, Handschriften und Autographen, American Book Prices Current and Autograph Prices Current for Einstein items previously on the market has been initiated. A list of all such items will be compiled, together with any quotations given in the original catalogues, for inclusion in the Einstein Papers. In addition, major current auction and

dealer catalogues are being regularly followed to locate and obtain copies of new items as they come on the market.

Finally, a broadcast request for information on relevant holdings will be sent to all major libraries, archives, etc., which have not otherwise been contacted. Advertisements or notices requesting information on privately-held items of interest will be inserted in a number of scholarly journals, professional society newsletters, and newspapers. Several new documents have been obtained already as a result of such notices.

It is already clear that one or more trips to visit archives and repositories in Germany, Switzerland, Czechoslovakia, Austria, and possibly other countries will have to be undertaken to uncover material from the period covered by this grant request. Wherever possible, such trips will be combined with other activities. For example, Dr. Stachel has been invited to speak at a conference in Israel this December, and will visit Israeli archives during this trip. Dr. Schulmann combined a vacation trip to California with visits to the Hoover Institution, Stanford University and Bancroft Library, University of California, during which he uncovered several significant documents indicating that Einstein was receiving a subsidy from a Berlin industrialist as early as 1910.

[1] C. Kirsten and H.-J. Treder (eds.), Albert Einstein in Berlin 1913-1933 Teil II Spezialinventar (Berlin: Akademie-Verlag, 1979).

WORD PROCESSING REQUIREMENTS

A recent report to the National Historical Publications and Records Commission emphasized the importance of incorporating computers and word processors into the work of large-scale editing projects in order to effect substantial savings of time and money.[1] The Control Index to the Einstein Archive, mentioned in the Introduction, was prepared in computerized form. This enabled rapid preparation of chronological and alphabetical listings of the contents of the Archive which have proved indispensable for the editorial work.

The Press has already adopted the Penta System for computerized typesetting. Thus, it seems advisable to plan on doing as much of the editorial work as the present state of the art allows using word processing equipment, as well as many other secretarial tasks. The optimal goal is preparation of final copy for the volumes in the form of magnetic tapes compatible with the Press' typesetting system.

The Einstein Papers present several unique problems when compared with projects, such as the Jefferson Papers and the Edison Papers, which are already using word processing equipment. The majority of the documents are in German. There are also texts in French, Spanish, and Italian. The editorial apparatus is in English. We would like a system that can handle these languages simultaneously, including the ability to store, display and print them. An even greater problem is the need to store and the desirability of being able to display and print a large number of mathematical and physical symbols, and to format them in equations and other complicated mathematical expressions.

Two alternate ways of meeting these requirements are being considered. The first is to use a small shared-logic system, with one or more keyboard-display terminals, capable of storing and processing the contents of the volume being edited. This system would have to be compatible with a mainframe computer to be used for the storage and processing of the larger batches of information involved in preparation of cumulative indices, etc. This is the system used by the Jefferson Papers. The other possibility is to use one or more display terminals directly connected to a mainframe computer, together with a software package, such as one of the UNIX Systems, best able to meet our requirements. This is the system currently being used in editing Historical Studies in the Physical Sciences. Either choice will also involve the acquisition of a high quality printer.

Preparation of the first volume of the Einstein Papers is so far advanced that it seems advisable to finish editorial work on it using the transcriptions already typed. We will continue to investigate available word processing systems in this fast-changing field and reach a decision during 1983. We will then switch over to the word processing system for the second or third volume, depending on how far work has progressed by that time.

The budget estimates for computer hardware, software, and operating costs are based on the adoption of the first alternative. If the second is adopted, the initial cost of equipment may be lower, but the operating costs of the system will be increased, since it will be necessary to pay for considerably more mainframe computer time. No item costing more than \$10,000 will be purchased without prior National Science Foundation Approval, of course, and the required certification will then be given.

Once we have gotten the word processing system, it is expected that it can be used for transcription of documents, editing of texts, and indexing. We shall then be able to operate with minimal secretarial help, since many normal office procedures, such as handling of correspondence, preparation of reports, arrangement of lists, etc., can be easily done with such a system.

[1] Henry F. Graff and A. Simone Reagor, "Documentary Editing in Crisis: Some Reflections and Recommendations", March 1981.

CONTACTING EINSTEIN'S COLLABORATORS

In the early years of the project, a number of living correspondents of Einstein were contacted and many valuable comments, as well as some additional items of correspondence were secured. This work had to be interrupted during the period when the editorial duplicate of the Archive was not available. It has now been resumed. In particular, living co-workers of Einstein not yet interviewed are being contacted. Dr. Nathan Rosen was interviewed by the Editor during a trip to Israel and by follow-up correspondence. This resulted in Dr. Rosen finding several additional Einstein letters in his files, of which he has supplied photocopies. Still to be interviewed are Drs. Valentine Bargmann, Peter Bergmann, Banesh Hoffmann, Bruria Kaufman, and Ernst Straus. Even though their contacts with Einstein occurred at a much later date than the period covered in the initial phase of publication it is advisable, in view of their age and the importance of the material, to get comments on their correspondence and collaboration with Einstein in the immediate future. As much of this contact as possible will be done by mail, but personal interviews may also be needed.

SCHEDULE OF WORK DURING GRANT PERIOD

Although the editorial work is basically a continuous process of preparing material for publication in chronological sequence, it is convenient to publish the Einstein Papers in the following sequence:

The Student Years (1879-1900);

The Swiss Years (1900-1914);

The Berlin Years (1914-1933);

The Princeton Years (1933-1955).

This proposal covers editorial work on the first two periods: The Student Years and The Swiss Years. The latter period includes Einstein's relatively brief term at the German University in Prague.

The known material available for The Student Years includes: his first essay on physics; several high school essays and exercises; two notebooks of lecture notes on physics course taken at the ETH; less than a score of letters by, to or about Einstein; and about a dozen documents about his birth, citizenship and school career. It is unlikely that the search for new documents will turn up many additional items from this period, so one volume is all that will be needed.

Transcription of all these documents has been completed. Annotation is under way and should be finished by mid-1983. It is expected that the manuscript of this volume will be given to the publisher before the end of 1983.

The material for The Swiss Years will be issued in two series of Papers and Correspondence (see section on Plan of the Edition). The material available for the Papers includes: sixty published papers (manuscripts for only two of which are available); reviews of nineteen journal articles and of four books; printed versions of discussion comments by Einstein at several conferences (notably the First Solvay Congress in 1911, for which manuscript drafts have been found in the Library of the French Academy of Sciences); two short scientific manuscripts unpublished during Einstein's lifetime; and six notebooks consisting of lecture and research notes. A long, unpublished manuscript from 1912 is known to exist, and efforts are being made to secure a copy. In addition there are seven of Walter Daellenbach's lecture notebooks on Einstein's courses at the ETH. It is not likely that the search for new material will uncover any other unpublished manuscripts by Einstein from this period.

This material will fill three or four volumes of the Papers. Editorial work on the first of these volumes will proceed while The Student Years is being finished, and it is expected to be ready for publication by early 1984. The second, third, and fourth volume (if one is needed) will be completed in early 1985, 1986 and 1987 respectively.

The material available for the Correspondence includes over 200 letters from and 100 letters to Einstein; about a dozen third-party letters about Einstein; and about a dozen documents dealing with Einstein's life, marriage, patent office work and academic career. A number of other documents on his academic career in Prague and the call to Berlin have been discovered; efforts to obtain photocopies will be made.

It is possible that the search for new documents will yield a substantial number of additional documents bearing on Einstein's early academic activities. It is less likely that a substantial number of additional letters from The Swiss Years will be uncovered, but still possible. A small number of such early letters (as well as many later ones) were recently found in the Brandeis University Library, for example. Depending on the amount of additional material uncovered, the Correspondence for The Swiss Years will fill either one or two volumes. Since the search must be completed before these volumes are issued, it is not expected that the first volume of this series will be ready before 1985, at the earliest.

APPENDIX A

SAMPLE DOCUMENTS

INTRODUCTORY NOTE	A-1
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INTRODUCTORY NOTE

Einstein's first published paper (Einstein 1901) and a group of related letters have been chosen as a sample of the application of the editorial method described in the proposal. Photocopies of the manuscript letters are included for comparison with the transcribed version. Several points should be borne in mind in reading these documents:

The annotations provided are meant to suggest the level and type of annotation to appear in the printed volumes, and are not in final form. As we acquire additional material, and clear up certain questions still under study, we hope to improve their content.

A relevant letter from Hermann Einstein (Albert's father) to Wilhelm Ostwald printed in Kürber 1964 is not included here because we do not yet have a photocopy of the original letter. It will, of course, be included in the final edition.

The text of Einstein 1901 is photocopied from Annalen der Physik, with annotations and footnotes added. It is more efficient and accurate to work in this way from a photocopy of a printed source, and then keyboard the entire document for the final printed version.

A headnote preceding Einstein 1901 and 1902a is included, providing some background information on Einstein's work on intermolecular forces, a subject he almost entirely abandoned after that. This is not to be taken to imply that each paper will be given a separate headnote.

Ronald Clark, Einstein: The Life & Times notes the existence of a blank "reply-page second half" of the postcard, Einstein to Kamerlingh Onnes, 12 April, 1901 (p. 43). No evidence of this exists on the photocopy in the Einstein Archive. Should consultation of the original prove Clark's information correct, the existence of the blank reply-page will be noted in the final annotation of the letter.

The following abbreviations are used in the sample documents:

1) Descriptive symbols:

ALSF Autograph letter signed, in Fraktur script

APSF Autograph postcard signed, in Fraktur script

2) Archival designations:

ZAAW Zentrales Archiv der Akademie der Wissenschaften
der DDR, Berlin

RGN Rijksmuseum voor de Geschiedenis der Natuurwetenschappen, Leiden

- 3) Books and articles to be cited more than once are cited by author and year of publication, followed by a letter in lower case if there is more than one from the same year.

For example: Seelig 1952

Einstein 1902a

A complete list of these abbreviations is given in the Bibliography, with full citations.

Last names of all individuals for whom a capsule biography would be provided at the end of the volume are printed in capital letters (e.g., Marcel GROSSMANN). If the person in question is cited as author/recipient of a letter, however, the name appears as in regular usage (Einstein to Grossmann, 14 April, 1901). Similarly, the titles of documents appearing elsewhere in the Einstein Papers are printed in capital letters (e.g., WEBER NOTEBOOK II).

LETTERS

LETTER TO WILHELM OSTWALD

OF 19 March, 1901

Zürich den 19 März 1901.

Liebes Briefchen für Professor!

Da ich dich ja wohl nicht allgemain
kenne, so lasse ich mich erlauben,
dich ein wenig zu kennen. Ich bin
ein Schweizer, d. h. ein Offizier. Ich bin
ganz und gar nicht reich, bin aber
ein wenig reichlich für einen einfachen
Offizier, das mit alledem Mühen
und Arbeit, das man zu thun hat.
Ich bin ein Schweizer, und ich
bin ein Schweizer, und ich bin ein
Schweizer, und ich bin ein Schweizer,
und ich bin ein Schweizer, und ich
bin ein Schweizer, und ich bin ein
Schweizer.

Mein herzlichster Gruß für dich

Albert Einstein

Strassburg 71.

Melano

Italien.

TO WILHELM OSTWALD^[1]

Zürich den 19. März 1901.

Sehr geehrter Herr Professor!

Da ich durch Ihr Werk über allgemeine Chemie zu der beiliegenden Abhandlung angeregt worden bin, bin ich so frei, Ihnen ein Exemplar davon zu schicken.^[2] Bei dieser Gelegenheit erlaube ich mir auch, Sie zu fragen, ob Sie vielleicht für einen mathematischen Physiker, der mit absoluten Messungen vertraut ist, Verwendung hätten.^[3] Ich nehme mir nur darum die Freiheit zu einer solchen Anfrage, weil ich unbemittelt bin, und mir nur eine derartige Stelle die Möglichkeit weiterer Ausbildung bieten könnte.

Mit vorzüglicher Hochachtung zeichne ich

Albert Einstein

Via Bigli 21.

Milano

Italia.^[4]

ALSF (ZAAW: Wilhelm-Ostwald-Archiv)

[1] Wilhelm Ostwald (1853-1932) was professor of physical chemistry at the University of Leipzig.

[2] The first volume of Ostwald 1891 served as the major reference work for Einstein 1901, a reprint of which is still in the Ostwald collection, ZAAW (see Körber 1964). If Ostwald read it, it is unlikely he was favorably impressed by Einstein's use of the atomic-molecular hypothesis. As an anti-atomist, Ostwald attacked such explanations of capillarity in the introduction to Ostwald 1893. He gave up his anti-atomism about 1909, partly in response to Einstein's work on Brownian motion.

[3] Einstein had taken WEBER's course on "System der absoluten elektrischen Messungen" (ETH ABGANGS-ZEUGNIS, 2 August, 1900).

[4] Einstein left Zürich shortly thereafter to join his parents at this address.

LETTER TO WILHELM OSTWALD

OF 3 April, 1901

V

Milano den 3. April 1901.

Liebes Herr Professor!

Ich habe Ihre Briefe
von vorigen Sonntag ab
bekommen, Ihnen von Zürich
mit einer kleinen Absendung
zu übersenden, die ich in
bestmöglicher Eile
zusammenstellen werde.

Ich bin ein Freund der
Naturwissenschaften und
ich bin sehr stolz auf Sie,
denn Sie sind ein
ausgezeichnete Forscher,
und ich bin sehr stolz
auf Sie, dass Sie ein
ausgezeichnete Forscher
sind, und ich bin sehr
stolz auf Sie, dass Sie
ein ausgezeichnete
Forscher sind.

Mit herzlichsten Grüßen
Ihrer
Albert Einstein
cand. phys.
Milano
Via Bigli 21.

TO WILHELM OSTWALD

Mailand den 3. April 1901

Hoch geehrter Herr Professor!

Vor einigen Wochen erlaubte ich mir, Ihnen von Zürich aus eine kleine Abhandlung zu übersenden, die ich in Wiedemanns Annalen veröffentlichte.^[1]

Da mir an Ihrem Urteil darüber sehr viel gelegen ist, und ich nicht sicher bin, ob ich damals meine Adresse beigefügt habe, erlaube ich mir, dieselbe Ihnen nachträglich zu übermitteln.

Mit vorzüglicher Hochachtung ergebenst

Albert Einstein
cand[idatus] phys[icae]^[2]
Milano
Via Bigli 21.

APSF (ZAAW: Wilhelm Ostwald-Archiv)

[1] See Einstein to Ostwald, 14 March, 1901. Upon Gustav Wiedemann's death in 1899, Paul Drude assumed editorship of the Annalen der Physik, thereafter properly referred to as Drude's Annalen.

[2] At this time, Einstein was planning to submit his work on molecular forces to the University of Zürich for a doctorate in physics (Einstein to Grossmann, 14 April, 1901, note 9).

LETTER TO HEIKE KAMERLINGH ONNES

OF 12 April, 1901

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München d. 12. April.

Sehr geehrte Frau Professor!

Ich bin Ihnen sehr dankbar dafür, dass Sie meine Aufforderung erfüllt haben. Ich habe mich sehr über die Mitteilung für die Aufnahme an der Universität für München freuen dürfen. Ich habe mich sehr über die Mitteilung für die Aufnahme an der Universität für München freuen dürfen. Ich habe mich sehr über die Mitteilung für die Aufnahme an der Universität für München freuen dürfen.

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Mit freundlichen Grüßen
Albert Einstein

Arch. 8

TOHEIKE KAMERLINGH ONNES^[1]

Mailand d. 12. April 1901

Sehr geehrter Herr Professor!

Durch einen Studienfreund^[2] erfahre ich, daß bei Ihnen eine Assistentenstelle frei ist. Ich erlaube mir, mich um dieselbe zu bewerben. Ich studierte 4 Jahre an der Abteilung für Mathematik und Physik des Polytechnikums in Zürich, wobei ich mich für Physik spezialisierte. Dort erwarb ich mir letzten Sommer das Diplom. Meine Zeugnisse stehen Ihnen natürlich gerne zu Diensten.^[3]

Auch beehre ich mich, Ihnen mit gleicher Post einen Abdruck meiner jüngst in den Annalen der Physik erschienenen Abhandlung^[4] zu unterbreiten.

Mit vorzüglicher Hochachtung

Albert Einstein

APSF (RGN)

[1] Kamerlingh Onnes (1853-1926) held the chair of experimental physics at the University of Leiden.

[2] This friend has not been identified. Einstein to Grossmann, 14 April, 1901, suggests that it may have been GROSSMANN or EHRAT.

[3] ETH ABGANGS-ZEUGNIS, 2 August, 1900.

[4] Einstein 1901.

LETTER TO MARCEL GROSSMANN

OF 14 April, 1901

Milano den 14. April. 1901

Lieber Marcel!

Als ich gestern Deinen Brief fand,
war ich wirklich überrascht über Deine Meinung
über Hauptformelhaftigkeit, die Du auf
ein Theorem allein fundiert und festgesetzt
nicht nicht fest setzen lassen. Ich glaube
es ist, daß nicht so leicht eine bessere
Bedeutung gegeben ist als die der Grundformel.
Ich glaube die nicht können gut passen, nicht
ich glaube nicht, wenn ich immer so
gerade die Schwierigkeit zu halten bemüht,
und daß ich nicht wissen möchte, eine
gute Lösung zu finden. Deine Meinung zu verstehen.
Ich bin sehr froh über die bei mir
geblieben, die von mir nicht nur alle mit
Befriedigung in einer Unversität zu finden. Ich
fühle mich sehr glücklich eine solche zu finden, wenn
Wahrheit nicht ein falscher Typus gegen mich
speziell. Ich habe sehr in Deiner Welt zu sein.

gedacht und laßt mir und den Genannten
ankommen. Gott segne den Erfolg und gebe
für ein leichtes Fall.

Es ist sehr schön für den furchtbaren
Freiwilligen und die ganze Welt. Das laßt
mir ein so großes Glück, daß mir noch
mehr selbst der alten Egoisten
erfolgreich. Jedem ist es ein
unabhängiges Leben zu sein dem
Freiwilligen.

Die wissenschaftliche Lagerung
sind und wir ganz furchtbare Leben
in den Kampf gekommen, das alle
nach einem selbstgebräutet werden
müssen. Das ist das Leben, das
meiner Freude der Abwechslung. Die
der Abwechslung und die Freude
werden können, und das ist die
wissenschaftliche Transplantation für fast alle
ihre anfängliche Erfahrung zu vermitteln
sollte werden. Dann ist es ein
Freiwilligen.

Ich habe mich bei meinem Nachkommenschaft der
Mittelklasse mit dem Hauptzweck
Forschung der Aufklärung der einen
großen Teil der Arbeit zu tun. Voller
wird es sein, wenn man zu einem
Zweck der besten Vorkursarbeiten
zu führen, die Arbeit zu tun. In
dem Fall, wenn man nicht
hat, gibt es keine Arbeit zu tun. Die
Zweck der Arbeit ist, die Arbeit zu tun.
Es ist ein großer Teil der Arbeit,
die Arbeit zu tun. Die Arbeit zu tun
ist ein großer Teil der Arbeit, die
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ist ein großer Teil der Arbeit, die
Arbeit zu tun.

Ich habe mich bei meinem Nachkommenschaft
die Arbeit zu tun. Die Arbeit zu tun
ist ein großer Teil der Arbeit, die
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Albert Einstein
Vice Bogli 21
Milano

TO MARCEL GROSSMANN^[1]

Mailand den 14. April. [1901]

Lieber Marcel!

Als ich gestern Deinen Brief fand, war ich wirklich gerührt über Deine Treue und Menschenfreundlichkeit, die Dich an Deinen alten Freund und Pechvogel noch nicht hat vergessen lassen. Ich glaube wirklich, daß nicht so leicht einer bessere Kollegen gehabt hat wie ich in Dir und Ehrat.^[2] Ich brauche Dir wohl kaum zu sagen, daß ich glücklich wäre, wenn ich einen so schönen Wirkungskreis erhalten könnte, und daß ich alles aufbieten würde, um Eurer Empfehlung keine Unehre zu machen.^[3] Seit drei Wochen bin ich hier bei meinen Eltern, um von hier aus eine Stelle als Assistent in einer Universität zu suchen.^[4] Ich hätte auch längst eine solche gefunden, wenn Weber^[5] nicht ein falsches Spiel gegen mich spielte. Trotzdem lasse ich kein Mittel unversucht und laß mir auch den Humor nicht verderben ... Gott schuf den Esel und gab ihm ein dickes Fell.

Wir haben hier den herrlichsten Frühling, und die ganze Welt hierlacht einen so glücklich an, daß man ganz von selbst den alten Hypochonder^[6] abstreift. Zudem schützen mich hier musikalische Bekannte vor dem Versauern.^[7]

In wissenschaftlicher Beziehung sind mir ein paar herrliche

Ideen in den Kopf gekommen, die nur noch gehörig ausgebrütet werden müssen. Ich glaube nun sicher, daß meine Theorie der Attraktionskräfte der Atome^[8] auch auf Gase ausgedehnt werden kann, und daß die charakteristischen Konstanten für fast alle Elemente ohne erhebliche Schwierigkeit zu ermitteln sein werden. Dann wird auch die Frage nach der innern Verwandtschaft der Molekularkräfte mit den Newtonschen Fernkräften ihrer Entscheidung um einen großen Schritt näher rücken. Vielleicht werden die schon von andern zu andern Zwecken angestellten Untersuchungen zur Prüfung der Theorie hinreichen. In diesem Fall werde ich dann alles bis jetzt Erreichte über molekulare Anziehung zur Doktordissertation verwenden.^[9] Es ist ein herrliches Gefühl, die Einheitlichkeit eines Komplexes von Erscheinungen zu erkennen, die der direkten sinnlichen Wahrnehmung als ganz getrennte Dinge erscheinen.

Ich bitte Dich, Deine werten Angehörigen freundlichst von mir zu grüßen, und Deinem Papa herzlichst für seine Bemühung zu danken, sowie für das Vertrauen, das er mir dadurch entgegenbrachte, daß er mich empfohlen hat. Dir einen freundschaftlichen Gruß von Deinem

Albert Einstein
Via Bigli 21
Milano.

ALSF (Photocopy provided by Miss Elsbeth Grossmann)

[1] GROSSMANN (1878-1936), after graduating from the Federal Institute of Technology (ETH) in 1900, spent the following year there as assistant to Wilhelm Fiedler, professor of descriptive geometry.

[2] Jakob EHRAT (1876-1960). After graduating from the ETH in 1900, he spent the following three years there as assistant to mathematics professor Ferdinand Rudio.

[3] Jules Grossmann, Marcel's father, recommended Einstein to Friedrich HALLER (1844-1936), Director of the Swiss Patent Office, with whom he was on friendly terms. See Einstein's "Autobiographische Skizze," (Seelig 1956, p. 12).

[4] See Einstein to Ostwald, 19 March and 3 April, 1901 and Einstein to Kamerlingh Onnes, 12 April, 1901.

[5] Heinrich Friedrich WEBER (1843-1912). After leading Einstein to believe he would receive an assistantship upon graduation, Weber chose two engineers as his assistants in 1900 (Kayser 1930, pp. 59-60 and Seelig 1952, p. 49).

[6] Einstein's chronic stomach troubles may already have begun. Their origin has been attributed to undernourishment while Einstein was a student at the ETH (Kayser 1930, pp. 53-54).

[7] Probably the Ansbacher family (see Einstein to Alfred Stern, 3 May, 1901).

[8] See Einstein 1901.

[9] Nothing came of this plan. In November 1901 Einstein submitted his third paper (Einstein 1902b) to the University of Zürich in an unsuccessful attempt to get a doctorate (see Einstein to Swiss Patent Office, 18 December, 1901). In early 1903 he temporarily abandoned attempts to get a doctorate (see Einstein to BESSO, [January, 1903]). He finally obtained it from Zürich for Einstein 1905a.

PAPER

HEADNOTE

Einstein's first two papers (1901, 1902a) were part of an investigation of the "attractive forces between atoms" (Einstein to Grossmann, 14 April, 1901), in the mechanistic tradition of explaining physical phenomena by means of central forces between particles. He uses thermodynamic methods to evaluate postulated molecular characteristic constants from experimental data.^[1] The first indication of Einstein's interest in the problem of molecular forces is his comment "Investigate! Vacation" in WEBER NOTEBOOK II, [1896-1900], where WEBER refers to the unknown form of the intermolecular force law in fluids. The explanation of capillary phenomena by means of short-range molecular forces had been actively pursued since Laplace and a lecture on capillarity by Minkowski at the Swiss Federal Institute of Technology (ETH), summer 1900, drew Einstein's praise.^[2] In his letter to Ostwald of 19 March, 1901 Einstein states that his first paper was stimulated by the latter's Lehrbuch der allgemeinen Chemie, vol. one of which is the only reference mentioned.^[3] Einstein's letter to Grossmann, 14 April, 1901 indicates he hoped to use his first paper as the basis of a doctoral dissertation but after second paper he abandoned the subject of molecular forces, with one exception (Einstein 1911a). A few years later he referred to his "two worthless beginner's works" (Einstein to Stark, 7 December, 1907). Attempts to use his 1901 paper in a renewed search for an academic position (Einstein to Ostwald, 19 March & 3 April, 1901; to Kamerlingh Onnes, 12 April, 1901; H. Einstein to Ostwald, 13 April, 1901) were no more successful.

[1] It was not uncommon to combine the thermodynamic and molecular approaches to capillarity. For contemporary surveys mentioning Einstein 1901, see Friedrich Pockels, "Kapillarität in Winkelmann 1908, pp.1119-1234; Herbert Freundlich, Kapillarchemie (Leipzig: Akademische Verlagsgesellschaft, 1909).

[2] Louis KOLLROS, "Erinnerungen eines Kommilitonen" (Seelig 1956, pp. 17-31) reports Einstein's comment after the lecture: "That is the first lecture on mathematical physics that we have heard at the Poly!"

[3] The data Einstein cites establishes that he used the second edition of this volume. Ostwald became an energeticist about the time he wrote the Introduction to the second volume (Ostwald 1893) in which he attacks molecular theories of capillarity and advocates a purely thermodynamic treatment (pp. 27-29).

FOLGERUNGEN AUS DEN CAPILLARITÄTSPHÄNOMENEN

Zürich, den 13. December 1900.
(Eingegangen 16. December 1900.)
[Published in *Annalen der Physik*,
vol. 4, no. 3, 1 March, 1901]

Bezeichnen wir mit γ diejenige Menge mechanischer Arbeit, welche wir der Flüssigkeit zuführen müssen, um die freie Oberfläche um die Einheit zu vergrössern, so ist γ nicht etwa die gesamte Energiezunahme des Systems, wie folgender Kreisprozess lehrt. Sei eine bestimmte Flüssigkeitsmenge vorliegend von der (absoluten) Temperatur T_1 und der Oberfläche O_1 . Wir vermehren nun isothermisch die Oberfläche O_1 auf O_2 , erhöhen die Temperatur auf T_2 (bei constanter Oberfläche), vermindern dann die Oberfläche auf O_1 und kühlen dann die Flüssigkeit wieder auf T_1 ab. Nimmt man nun an, dass dem Körper ausser der ihm vermöge seiner specifischen Wärme zukommenden keine andere Wärmemenge zugeführt wird, so ist bei dem Kreisprozess die Summe der dem Körper zugeführten Wärme gleich der Summe der ihm entnommenen. Es muss also nach dem Princip von der Erhaltung der Energie auch die Summe der zugeführten mechanischen Arbeiten gleich Null sein.

[513]

Es gilt also die Gleichung:^[1]

$$(O_2 - O_1)\gamma_1 - (O_2 - O_1)\gamma_2 = 0 \quad \text{oder} \quad \gamma_1 = \gamma_2.$$

Dies widerspricht aber der Erfahrung.^[2]

Es bleibt also nichts anderes übrig als anzunehmen, dass mit der Aenderung der Oberfläche auch ein Austausch der Wärme verbunden sei, und dass der Oberfläche eine eigene specifische Wärme zukomme. Bezeichnen wir also mit U die Energie, mit S die Entropie der Oberflächeneinheit der Flüssigkeit, mit s die specifische Wärme der Oberfläche, mit w_0 die zur Bildung der Oberflächeneinheit erforderliche Wärme in mechanischem Maass, so sind die Grössen:

$$dU = s \cdot O \cdot dT + (\gamma + w_0) dO$$

und

$$dS = \frac{s \cdot O \cdot dT}{T} + \frac{w_0}{T} dO$$

vollständige Differentiale. Es gelten also die Gleichungen:

[1] The second γ_1 in the following equation should read γ_2 .

[2] Surface tension is found to be a (decreasing) function of temperature. Essentially the same argument was first given by Lord Kelvin (William Thomson, *Proceedings of the Royal Society* 9 (1858): 255-256).

$$\frac{\partial (s \cdot O)}{\partial O} = \frac{\partial (\gamma + w_0)}{\partial T}, \quad [514]$$

$$\frac{\partial}{\partial O} \left(\frac{s \cdot O}{T} \right) = \frac{\partial}{\partial T} \left(\frac{w_0}{T} \right).$$

Aus diesen Gleichungen folgt:

$$\gamma + w_0 = \gamma - T \frac{\partial \gamma}{\partial T}.$$

Dies aber ist die gesamte Energie, welche zur Bildung der Einheit der Oberfläche nötig ist.

Bilden wir noch:^[3]

$$\frac{d}{dT} (\gamma + w_0) = -T \frac{d^2 \gamma}{dT^2}.$$

Die Experimentaluntersuchungen haben nun ergeben, dass sich stets sehr nahe γ als lineare Function der Temperatur darstellen lässt,^[4] d. h.:

Die zur Bildung der Oberflächeneinheit einer Flüssigkeit nötige Energie ist unabhängig von der Temperatur.

Ebenso folgt:

$$s = \frac{d\gamma}{dT} + \frac{dw_0}{dT} = \frac{d\gamma}{dT} - \frac{d\gamma}{dT} - T \frac{d^2 \gamma}{dT^2} = 0,$$

also: Der Oberfläche als solcher ist kein Wärmeinhalt zuzuschreiben, sondern die Energie der Oberfläche ist potentieller Natur.^[5] Man sieht schon jetzt, dass

$$\gamma - T \frac{d\gamma}{dT}$$

eine zu stöchiometrischen Untersuchungen sich geeignetere Grösse ist, als das bisher benutzte γ bei Siedetemperatur. Die Thatsache, dass die zur Bildung der Oberflächeneinheit erforderliche Energie kaum mit der Temperatur variirt, lehrt uns aber auch, dass die Configuration der Molecüle in der Oberflächenschicht mit der Temperatur nicht variiren wird (abgesehen von Aenderungen von der Grössenordnung der thermischen Ausdehnung).

Um nun für die Grösse

$$\gamma - T \frac{d\gamma}{dT}$$

eine stöchiometrische Beziehung aufzufinden, ging ich von den einfachsten Annahmen über die Natur der molecularen An-

[3] The following equation has been called Einstein's equation by Raymond Defay and Ilya Prigogine, Surface Tension and Adsorption (New York: John Wiley and Sons, 1966), p. 46. Ordinary derivatives are used since (if the curvature of the surface is neglected) γ is a function of T only.

[4] See Ostwald 1891, pp. 523-525.

[5] This is Einstein's justification for computing the surface energy from a static model, neglecting motion of the molecules, even though the mechanical theory of heat is based on a kinetic model. Einstein uses heat content (Wärmeinhalt) in the sense of internal kinetic energy.

ziehungskräfte aus, und prüfte deren Consequenzen auf ihre Uebereinstimmung mit dem Experiment hin. Ich liess mich dabei von der Analogie der Gravitationskräfte leiten. [515]

Sei also das relative Potential zweier Molecüle von der Form:

$$P = P_{\infty} - c_1 \cdot c_2 \cdot \varphi(r),$$

wobei c eine für das betreffende Molecül charakteristische Constante ist, $\varphi(r)$ aber eine vom Wesen der Molecüle unabhängige Function ihrer Entfernung.^[6] Wir nehmen ferner an, dass

$$\frac{1}{2} \sum_{\alpha=1}^n \sum_{\beta=1}^n c_{\alpha} c_{\beta} \varphi(r_{\alpha, \beta})$$

der entsprechende Ausdruck für n Molecüle sei. Sind speciell alle Molecüle gleich beschaffen, so geht dieser Ausdruck in

$$\frac{1}{2} c^2 \sum_{\alpha=1}^n \sum_{\beta=1}^n \varphi(r_{\alpha, \beta})$$

über. Wir machen ferner noch die Annahme, dass das Potential der Molecularkräfte ebenso gross sei, wie wenn die Materie homogen im Raume verteilt wäre; es ist dies allerdings eine Annahme, von der wir nur angenähert die Richtigkeit erwarten dürfen. Mit ihrer Hülfe verwandelt sich der obige Ausdruck in:

$$P = P_{\infty} - \frac{1}{2} c^2 N^2 \iint d\tau \cdot d\tau' \varphi(r_{d\tau, d\tau'}),$$

wobei N die Anzahl der Molecüle in der Volumeneinheit ist. Ist das Molecül unserer Flüssigkeit aus mehreren Atomen zusammengesetzt, so soll analog wie bei den Gravitationskräften $c = \sum c_{\alpha}$ gesetzt werden können, wobei die c_{α} den Atomen der Elemente charakteristische Zahlen bedeuten. Setzt man noch $1/N = v$, wobei v das Molecularvolum bedeutet, so erhält man die endgültige Formel:

$$P = P_{\infty} - \frac{1}{2} \frac{(\sum c_{\alpha})^2}{v^2} \iint d\tau \cdot d\tau' \varphi(r_{d\tau, d\tau'}).$$

Setzen wir nun noch voraus, dass die Dichte der Flüssigkeit bis zu deren Oberfläche constant ist, was ja durch die Thatsache wahrscheinlich gemacht wird, dass die Energie der Oberfläche von der Temperatur unabhängig ist, so sind wir nun im stande die potentielle Energie der Volumeneinheit im

[6] This potential also depends on the range of intermolecular force (See Pais 1982, p. 47). Einstein in effect assumes the same range for all molecules, resulting in an incorrect dependence of unit surface and volume potential energies on the specific volume of the fluid. Einstein 1911a (without mentioning 1901) shows such an assumption to be untenable. The difficulty can be overcome if the potential energy is taken as a universal function of r/R , where R is the range of the force.

Inneren der Flüssigkeit und die der Oberflächeneinheit zu berechnen.^[7] [516]

Setzen wir nämlich

$$\frac{1}{2} \int_{z=-\infty}^{+\infty} \int_{y=-\infty}^{+\infty} \int_{x=-\infty}^{+\infty} dx dy dz \cdot \varphi(\sqrt{x^2 + y^2 + z^2}) = K,$$

so ist die potentielle Energie der Volumeneinheit

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v^2}.$$

Denken wir uns eine Flüssigkeit vom Volumen V und von der Oberfläche S , so erhalten wir durch Integration^[8]

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v^2} \cdot V - K' \frac{(\sum c_a)^2}{s^2} \cdot O,$$

wobei die Constante K' bedeutet:^[9]

$$\int_{x'=0}^{x'=1} \int_{y'=0}^{y'=1} \int_{z'=0}^{z'=0} \int_{x=-\infty}^{x=\infty} \int_{y=-\infty}^{y=\infty} \int_{z=0}^{z=\infty} dx \cdot dy \cdot dz \cdot dx' \cdot dy' \cdot dz' \cdot \varphi \sqrt{(x-x')^2 + (y-y')^2 + (z-z')^2}.$$

Da über φ nichts bekannt ist, bekommen wir natürlich keine Beziehung zwischen K und K' .

Dabei ist zunächst im Auge zu behalten, dass wir nicht wissen können, ob das Flüssigkeitsmolecul nicht die n -fache Masse des Gasmolecules besitzt, doch folgt aus unserer Herleitung, dass dadurch unser Ausdruck der potentiellen Energie der Flüssigkeit nicht geändert wird. Für die potentielle Energie der Oberfläche bekommen wir, auf Grund der eben gemachten Annahme, den Ausdruck:^[10]

$$P = K' \frac{(\sum c_a)^2}{s^2} = \gamma - T \frac{d\gamma}{dT},$$

oder

$$\sum c_a = v \cdot \sqrt{\gamma - T \frac{d\gamma}{dT} \cdot \frac{1}{\sqrt{K'}}}.$$

[7] With certain assumptions about the nature of molecular forces, the expression given for the total potential energy can be transformed into the sum of volume and surface energy terms. (See Minkowski 1911, pp. 333-336). Einstein, however, seems to have calculated the volume and surface energies directly. He may already have read Boltzmann 1898 (cited in Einstein 1902b), which contains similar calculations in a discussion of capillary forces (pp. 55-62).

[8] The last minus sign in the following equation should be a plus sign.

[9] Dimensional considerations show the following formula for K' to be incorrect. Einstein 1911a gives the correct expression for this constant, without referring to 1901. The final dz should read dz' , and an open parenthesis should follow ϕ .

[10] Actually, the following equation gives the surface potential energy per unit area.

Da die rechts stehende Grösse für Siedetemperatur für viele Stoffe aus den Beobachtungen von R. Schiff berechenbar ist, so bekommen wir reichlichen Stoff zur Bestimmung der Grössen c_n . Ich entnahm das gesamte Material dem Buch über Allgemeine Chemie von W. Ostwald.^[11] Ich gebe hier zunächst das Material an, mittels dessen ich das c_n für C, H, O nach der Methode der kleinsten Quadrate berechnete. In der mit $\sum c_{n\text{ber.}}$ überschriebenen Columne sind die $\sum c_n$ angegeben, wie sie mit Hilfe der so gewonnenen c_n aus den chemischen Formeln sich ergeben. Isomere Verbindungen wurden zu einem Wert vereinigt, weil die ihnen zugehörigen Werte der linken Seite nur unbedeutend voneinander abwichen. Die Einheit wurde willkürlich gewählt, weil, da K' unbekannt ist, eine absolute Bestimmung der c_n nicht möglich ist.

Ich fand:

$$c_H = -1,6, \quad c_C = 55,0, \quad c_O = 46,8.$$

Formel	$\sum c_n$	$\sum c_{n\text{ber.}}$	Name der Verbindung
$C_{10}H_{16}$	510	524	Citronenterpen
CO_2H_2	140	145	Ameisensäure
$C_2H_4O_2$	198	197	Essigsäure
$C_3H_6O_2$	250	249	Propionsäure
$C_4H_8O_2$	309	301	Buttersäure und Isobuttersäure
$C_5H_{10}O_2$	365	352	Valeriansäure
$C_4H_8O_2$	350	350	Acetanhydrid
$C_6H_{12}O_4$	505	501	Aethyloxalat
$C_6H_8O_2$	494	520	Methylbenzoat
$C_6H_{10}O_2$	553	562	Aethylbenzoat
$C_6H_{10}O_2$	471	454	Acetessigäther
C_7H_8O	422	419	Anisol
$C_8H_{10}O$	479	470	Phenetol und Methylcresolat
$C_8H_{10}O_2$	519	517	Dimethylresorcin
$C_8H_8O_2$	345	362	Furfurol
$C_7H_{10}O$	348	305	Valeraldehyd
$C_{10}H_{14}O$	587	574	Carvol

Man sieht, dass die Abweichungen in fast allen Fällen die Versuchsfehler wohl kaum übersteigen und keinerlei Gesetzmässigkeit zeigen.

Hierauf berechnete ich gesondert die Werte für Cl, Br und J, welchen Bestimmungen natürlich eine geringere Sicherheit zukommt, und fand:

$$c_{Cl} = 60, \quad c_{Br} = 152, \quad c_J = 198.$$

Ich lasse nun in gleicher Weise wie oben das Material folgen:

[11] Ostwald 1891, pp. 528-530.

Formel	$\sum c_a$	$\sum c_{a,ber.}$	Name der Verbindung	[518]
C_6H_5Cl	385	379	Chlorbenzol	
C_7H_7Cl	438	434	Chlortoluol	
C_7H_7Cl	450	434	Benzylchlorid	
C_2H_5OCl	270	270	Epichlorhydrin	
C_2OHCl_2	358	335	Chloral	
C_7H_5OCl	462	484	Benzoylchlorid	
$C_7H_5Cl_2$	492	495	Benzylidenchlorid	
Br_2	217	304	Brom	
C_2H_5Br	251	254	Aethylbromid	
C_3H_7Br	311	306	Propylbromid	
C_3H_7Br	311	306	Isopropylbromid	
C_3H_7Br	302	309	Allylbromid	
C_4H_9Br	353	354	Isobutylbromid	
$C_5H_{11}Br$	425	410	Isoamylbromid	
C_6H_5Br	411	474	Brombenzol	
C_7H_7Br	421	526	o-Bromtoluol	
$C_7H_4Br_2$	345	409	Aethylenbromid	
$C_7H_4Br_2$	395	461	Propylenbromid	
C_2H_5J	288	300	Aethyljodid	
C_3H_7J	343	352	Propyljodid	
C_3H_7J	357	352	Isopropyljodid	
C_3H_7J	338	355	Allyljodid	
C_4H_9J	428	403	Isobutyljodid	
$C_5H_{11}J$	464	455	Isoamyljodid	

Es scheint mir, dass grössere Abweichungen von unserer Theorie bei solchen Stoffen eintreten, welche verhältnismässig grosse Molecularmaasse und kleines Molecularvolum haben.

Wir haben aus unseren Annahmen gefunden, dass die potentielle Energie der Volumeneinheit den Ausdruck besitzt:

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v}$$

dabei bedeutet K eine bestimmte Grösse, welche wir aber nicht berechnen können, da es überhaupt erst durch die Wahl der c_a vollkommen defintirt wird. Wir können daher $K = 1$ setzen und gewinnen so eine Definition für die absoluten Werte der c_a . Berücksichtigen wir dies von nun an, so erhalten wir für die Grösse des Potentials, welche dem Aequivalent (Molekül) zukommt, den Ausdruck:^[12]

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v}$$

[12] As indicated in the text, $K=1$ in the following equation.

wobei natürlich P_{∞} eine andere Constante bedeutet. Nun könnten wir aber das zweite Glied der rechten Seite dieser Gleichung der Differenz $D_m J - A v_d$ gleich setzen — wobei D_m die moleculare Verdampfungswärme (Dampfwärme \times Molecularmasse), J das mechanische Aequivalent der Calorie, A den Atmosphärendruck in absolutem Maass und v_d das Molecularvolum des Dampfes ist —, wenn die potentielle Energie des Dampfes Null wäre und wenn für Siedetemperatur der Inhalt an kinetischer Energie beim Uebergang vom flüssigen in den Gaszustand ungeändert bliebe.^[13] Die erste dieser Annahmen scheint mir unbedenklich. Da wir aber zu der letzteren Annahme keinen Grund haben, aber auch keine Möglichkeit die fragliche Grösse abzuschätzen, so bleibt uns nichts anderes übrig, als die obige Grösse selbst zur Rechnung zu benutzen.

[519]

In die erste Spalte der folgenden Tabelle habe ich die Grössen $\sqrt{D'_m \cdot v}$ im Wärmemaass eingetragen, wobei D'_m die um die äussere Verdampfungsarbeit (in Wärmemaass) verminderte Verdampfungswärme bedeutet. In die zweite setzte ich die Grössen $\sum c_{\text{ber}}$, wie sie aus den Capillaritätsversuchen ermittelt sind; in der dritten finden sich die Quotienten beider Werte. Isomere Verbindungen sind wieder zu einer Zeile vereinigt.^[14]

Name der Verbindung	Formel	$\sqrt{D'_m \cdot v}$	$\sum c_{\text{ber}}$	Quotient
Isobutylpropionat	$C_7H_{14}O_2$	1157	456	2,54
Isoamilacetat	"			
Propylacetat	"			
Isobutylisobutytrat	$C_8H_{16}O_2$	1257	510	2,47
Propylvalerat	"			
Isobutylbutytrat	"			
Isoamylpropionat	"			
Isoamylisobutytrat	$C_9H_{18}O_2$	1367	559	2,45
Isobutylvalerat	"			
Isoamylvalerat	$C_{10}H_{20}O_2$	1464	611	2,51
Benzol	C_6H_6	795	310	2,57
Toluol	C_7H_8	902	372	2,48
Aethylbenzol	C_8H_{10}	1005	424	2,37
m-Xylol	"			
Propylbenzol	C_9H_{12}	1122	475	2,36
Mesitylen	"			
Cymol	$C_{10}H_{14}$	1218	527	2,30
Aethylformiat	$C_3H_6O_2$	719	249	2,89
Methylacetat	"			

[13] The volume of the liquid is neglected here in comparison with that of the vapor. This discussion of latent heat of vaporization is very similar to one in WEBER NOTEBOOK II, [1896-1900].

[14] See Ostwald 1891, pp. 354-356 for the data on which the following table is based.

Name der Verbindung	Formel	$\sqrt{D'_m \cdot v}$	$\sum c_{\alpha \text{ber.}}$	Quotient	[520]
Aethylacetat	$C_4H_8O_2$	837	301	2,78	
Methylpropionat	"				
Propylformiat	"				
Methylisobutyrat	$C_5H_{10}O_2$	882	353	2,50	
Isobutylformiat	"				
Aethylpropionat	"				
Propylacetat	"				
Methylbutyrat	"				
Aethylisobutyrat	$C_6H_{12}O_2$	971	405	2,40	
Methylvalerat	"				
Isobutylacetat	"				
Aethylbutyrat	"				
Propylpropionat	"				
Isoamylformiat	"				

Trotzdem der in der fünften Columne eingetragene Quotient keineswegs eine Constante ist, sondern vielmehr deutlich von der Constitution der Stoffe abhängt, so können wir das vorliegende Material doch dazu benutzen, diejenige Zahl, wenigstens der Grössenordnung nach, zu ermitteln, mit der unsere c_a multiplicirt werden müssen, damit wir sie in der von uns gewählten absoluten Einheit erhalten. Der gesuchte Multiplikator ergibt sich im Mittel:

$$2,51 \cdot \sqrt{4,17 \cdot 10^7} = 1,62 \cdot 10^4.$$

Da die vorhergehende Betrachtung zeigt, dass sich bei der Verdampfung die kinetischen Verhältnisse der Molecüle verändern (wenigstens wenn unser Ausdruck für die potentielle Energie richtig ist), unternahm ich es die absolute Grösse c_a noch auf eine andere Weise aufzusuchen. Dabei ging ich von der folgenden Idee aus:

Comprimirt man eine Flüssigkeit isothermisch und ändert sich dabei ihr Wärmehalt nicht, was wir nun voraussetzen wollen, so ist die bei der Compression entweichende Wärme gleich der Summe der Compressionsarbeit und der von den Molecularkräften geleisteten Arbeit. Wir können also letztere Arbeit berechnen, wenn wir die bei der Compression entweichende Wärmemenge eruiren können. Dazu aber verhilft uns das Carnot'sche Princip.

Sei nämlich der Zustand der Flüssigkeit durch den Druck p [521]
in absoluten Einheiten und die absolute Temperatur T bestimmt;
ist nun bei einer unendlich kleinen Zustandsänderung dQ die
dem Körper zugeführte Wärme in absolutem Maass, dA die
ihm zugeführte mechanische Arbeit, und setzen wir

$$dQ = X dp + S. dT,$$

$$\begin{aligned} dA &= -p. dv = -p \left\{ \frac{\partial v}{\partial p} dp + \frac{\partial v}{\partial T} dT \right\} \\ &= p. v. \kappa dp - p. v. \alpha dT, \end{aligned}$$

so liefert uns die Bedingung, dass dQ/T und $dQ + dA$ vollständige
Differenziale sein müssen, die Gleichungen

$$\frac{\partial}{\partial T} \left(\frac{X}{T} \right) = \frac{\partial}{\partial p} \left(\frac{S}{T} \right)$$

und

$$\frac{\partial}{\partial T} (X + p\kappa) = \frac{\partial}{\partial p} (S - p\alpha)$$

hierbei bedeuten, wie man sieht, X die bei isothermischer
Compression durch den Druck $p = 1$ dem Körper zugeführte
Wärme in mechanischem Maass, S die spezifische Wärme bei
constantem Druck, κ den Compressibilitätscoefficienten, α den
thermischen Ausdehnungcoefficienten. Aus diesen Gleichungen
findet man:

$$X dp = -T \left\{ \alpha + p \frac{\partial \alpha}{\partial p} + p \frac{\partial \kappa}{\partial T} \right\} dp.$$

Nun ist daran zu erinnern, dass der Atmosphärendruck,
unter dem sich unsere Körper gewöhnlich finden, für Com-
pressionserscheinungen von Flüssigkeiten unbedenklich als un-
endlich klein zu betrachten ist; ebenso sind die Compressionen
in unseren Experimenten sehr nahe proportional den ange-
wandten Compressionskräften. Die Erscheinungen gehen also
so vor sich, wie wenn die Compressionskräfte unendlich klein
wären. Berücksichtigt man dies, so geht unsere Gleichung
über in:

$$X. dp = - T. \alpha. dp.$$

Wenden wir nun die Voraussetzung an, dass bei iso-
thermischer Compression die kinetische Energie des Systems
nicht geändert wird, so erhalten wir die Gleichung

$$X. dp + \text{Compressionsarbeit} + \text{Arbeit der Molecularkräfte} = 0.$$

Ist P das Potential der Molecularkräfte, so ist die letzte Arbeit: [522]

$$\frac{\partial P}{\partial v} \cdot \frac{\partial v}{\partial p} \cdot dp.$$

Setzt man unseren Ausdruck für die Grösse des Potentials der Molecularkräfte hierin ein und berücksichtigt, dass die Compressionsarbeit von der Ordnung dp^2 ist, so erhält man bei Vernachlässigung dieser unendlich kleinen Grösse zweiter Ordnung

$$\frac{T_a}{\alpha} = \frac{\sum c_a}{\alpha^2},$$

wobei α den Compressibilitätscoefficienten in absolutem Maasse bezeichnet. Wir erhalten so abermals ein Mittel, den gesuchten Proportionalitätscoefficienten für die Grössen c_a zu bestimmen. Die Grössen α und α' für die Temperatur des Eises entnahm ich den Tabellen von Landolt und Börnstein.^[15] Man erhält so für den gesuchten Factor die Werte:

Xylol	1,71 · 10 ⁴	Aethylalkohol	1,70 · 10 ⁴
Cymol	1,71 · 10 ⁴	Methylalkohol	1,74 · 10 ⁴
Terpentinöl	1,73 · 10 ⁴	Propylalkohol	1,82 · 10 ⁴
Aethyläther	1,70 · 10 ⁴	Amylalkohol	2,00 · 10 ⁴

Zunächst ist zu bemerken, dass die beiden durch verschiedene Methoden erlangten Coefficienten recht befriedigend übereinstimmen, trotzdem sie aus ganz verschiedenen Phänomenen hergeleitet sind.^[16] Die letzte Tabelle zeigt sehr befriedigende Uebereinstimmung der Werte, nur die kohlenstoffreicheren Alkohole weichen ab. Es ist dies auch zu erwarten, denn aus den Abweichungen, welche die Alkohole von dem thermischen Ausdehnungsgesetz von Mendelejew und von dem stöchiometrischen Capillaritätsgesetz von R. Schiff zeigen, hat man schon früher geschlossen, dass bei diesen Verbindungen mit Temperaturänderungen Aenderungen der Grösse der Flüssigkeitsmoleculé verbunden sind.^[17] Es ist also auch zu erwarten,

[15] Hans Landolt and Richard Börnstein, Physikalisch-chemische Tabellen, 2nd enl. ed. (Berlin: Julius Springer, 1894), pp. 107-109 and 265-269.

[16] The existence of a thermodynamic relationship between Einstein's two results was noted in a review of this paper by Otto Wiedeburg in Zeitschrift für physikalische Chemie 39 (1902): 378. The Clausius-Clapeyron equation, with the approximations used, may be written: $(\partial P/\partial T)_V = D'/T_v$. Using the identity $(\partial P/\partial T)_V (\partial V/\partial P)_T (\partial T/\partial V)_P = -1$ gives $D' = T_v \alpha/\kappa$. The Clausius-Clapeyron equation is derived (without name) in WEBER NOTEBOOK II, [1896-1900] in the course of a discussion of latent heat of vaporization.

[17] See Ostwald 1891, pp. 279, 398-399 for Mendeleev's formula. Einstein seems to be referring to the use of Schiff's data to test Eötvös' law, pp. 541-543.

dass bei isothermischer Compression solche moleculare Ver- [523]
änderungen auftreten, sodass für solche Stoffe bei gleicher
Temperatur der Wärmeinhalt Function des Volums sein wird.

Zusammenfassend können wir also sagen, dass sich unsere
fundamentale Annahme bewährt hat: Jedem Atom entspricht
ein moleculares Anziehungsfeld, welches unabhängig von der
Temperatur und unabhängig von der Art ist, wie das Atom
mit anderen Atomen chemisch verbunden ist.

Schliesslich ist noch darauf hinzuweisen, dass mit steigen-
dem Atomgewicht im allgemeinen auch die Constanten c_a steigen,
doch nichts stets und nicht in proportionaler Art. Die Frage, ob
und wie unsere Kräfte mit den Gravitationskräften verwandt
sind, muss also noch vollkommen offen gelassen werden.^[18] Es
ist auch hinzuzufügen, dass die Einführung der Function $\varphi(r)$,
welche unabhängig von der Natur der Molecüle sein sollte, nur
als Näherungsannahme aufzufassen ist, ebenso die Ersetzung
der Summen durch Integrale; in der That scheint sich unsere
Theorie für Stoffe von kleinem Atomvolum nicht zu bewähren,
wie das Beispiel des Wassers darthut. Ueber diese Fragen
sind erst von eingehenden Specialforschungen Aufschlüsse
zu hoffen.

Zürich, den 13. December 1900.

(Eingegangen 16. December 1900.)

[18] Einstein also discusses this question in his letter
to Grossmann, 14 April, 1901.

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APPENDIX B

INITIAL TRANSCRIPTION PROCEDURE

1. OVERVIEW

The transcription of each document is done on white paper, 8½" x 11" and is double-spaced. The left margin is set at 1½" on the left side, 2" on the right, and 1" at top and bottom. The transcriber's initials and date of transcription are written at the top left of the page, the document's control number in the duplicate Einstein Archive at the top right - if the original is located in the Einstein Archive - or the repository and acquisition number if from another source. This information is set off by a line running from margin to margin above the body of the transcription.

In the case of a transcription running to more than one page, the transcript page number is added to the control number on the right, while the transcriber's initials and the transcription date are retained on the left and set off with a line.

EXAMPLE: Olga Griminger's transcription of the third page of an item with control number 4 441 is headed

OG (5/25/82)

4 441-3

The cardinal goal of the transcription is faithfulness to the original text with no corrections in the text, no additions or deletions, whether of characters or punctuation except as specifically noted in the sections below. Where this policy might prove confusing in proofing, the problem is underlined in pencil with marginal comments in pencil.

If attempts to read letters, words, or phrases in the photocopy fail, earlier transcriptions (where they exist) made by Einstein's long-time secretary and archivist, Miss Helen Dukas, are consulted. Reference to Miss Dukas' archival notes may also help in supplying information as to author/recipient and date of letters where they are not indicated in the original. Any remaining obscure points requiring consultation of the original manuscript or further research are noted for follow-up (see 9. below).

2. HEADING

Each transcribed document is given a heading or title in capital letters, flush left to the margin and two lines below the line running from margin to margin. For letters, author/recipient are given (first

and last names) in capital letters, except that Einstein's name is always omitted. If the author/recipient cannot be determined, a question mark within square brackets is provided unless a person is referred to by his title in which case it is given in English.

EXAMPLES: TO WILHELM OSTWALD PAUL HABICHT TO CONRAD HABICHT
 FROM PAUL HABICHT FROM [?] RUPRECHT
 FROM CAPTAIN JONES

Undetermined first or last names of authors/recipients are noted for later work (see 9. below). If a non-correspondence item does not have a title in the original, a provisional title is provided in English.

EXAMPLES: WEBER NOTEBOOK II SWISS NATURALIZATION CERTIFICATE

3. PLACE AND DATELINE

The dateline is always placed four lines down from the heading, flush right, regardless of its position in the original. Information as to day, month, and year, missing in the original, is supplied, if known, in square brackets. Approximate dating may include "c" for "circa", "before" and "after" a given date; this information too is placed in square brackets.

EXAMPLES: [c. 11 May, 1905] [before June, 1913]

If the date is unknown, [n.d.] is inserted.

4. SALUTATION

In the case of correspondence, the salutation is placed flush left four lines below the dateline.

5. BODY OF TEXT

Line by line transcription of each document is employed. When a line in the original can't be encompassed in one line of transcription, the remainder is typed beginning in the middle of the next line and single-spaced. A new page in the original is designated in the transcription with a number in parentheses double-spaced between the last line of transcribed text and the first line of the text on the next page.

EXAMPLE:

Gestatten Sie, dass ich Ihnen die Hauptgedanken kurz vorlege; ich wäre
 Ihnen dankbar wenn Sie mir

(8)

ganz offen mitteilen wollten, was Sie davon denken.

In the case of correspondence, the text begins two lines below the salutation; in the case of non-correspondence, four lines below the dateline.

a. abbreviations. In cases where an abbreviation is uncommon or unclear, this is noted for further work (see 9. below). If there is no period, an extra space is left after the abbreviation as if there were a period.

EXAMPLE: spez Theorie

b. cancellations. All deleted letters, words, and phrases occurring in the original are indicated within angle brackets, before the revised text. If the cancellation is unclear, a guess may be made followed by a question mark; both are enclosed in angle brackets before the revised text. If no guess is possible, an estimate is made of the number of words and letters in the cancellation and this is indicated by an appropriate number of dashes within angle brackets.

EXAMPLES: <gestern> heute
 <übermorgen?> gestern
 <----->

c. missing, obscured or otherwise difficult to read material. Where one or two letters of a word are missing or have been obscured (because of blotting, cropping, aging of ink and paper) or are difficult to read, they are silently supplied. If more than two letters are missing, the reading is placed within square brackets with an assumption of correct spelling, grammar, and syntax. A question mark is used if the reading seems dubious and a series of dashes, corresponding to the letters or words, is employed within square brackets if no guess can be made.

d. interlineations and other insertions. Words interlineated in a half-line position are retained in that position in the transcript.

Where a phrase or sentence is not interlineated but marked by the author for insertion by a device such as an asterisk and physically located at the bottom or side of the page, the original position and device is retained.

Raised or lowered letters in the text are brought down to the line.

EXAMPLE: Septr. 7^{ten} becomes Septr. 7ten

e. punctuation. An extra space is left if any punctuation mark, such as a period, is missing (see above, 5a.).

EXAMPLE: Alles ging zu Ende Dann fing

f. paragraphing. The first paragraph of the transcript is always indented. Where new paragraphing occurs in the original, the transcript is indented five spaces.

g. peculiarities of German characters. "m̄" and "n̄" (abbreviating the double consonants "mm" and "nn") are expanded to "mm" and "nn". Where "ü" is used in the original to distinguish "u" from "n", it is rendered as "u".

h. diagrams. In the case of texts with diagrams, a photocopy of the diagram is inserted in the text (after leaving sufficient space for the insertion). Transcription of the labeling is provided in the left or right margin, while approximating the original spacing in relation to the diagram.

i. archivists' marks. These are not transcribed.

6. COMPLIMENTARY CLOSE

This is always run into one continuous text.

7. SIGNATURE

This is double-spaced down from the complimentary close and brought flush right.

8. POSTSCRIPT

This is placed two lines below the signature and is brought flush left.

9. TRANSCRIBER'S COMMENTS

Comments are set off from the end of the transcription by a line running from margin to margin. These include the document description (ALS, DS, etc.), notation of the provenance of the original and of the use of Fraktur script (if applicable), and of the address, if any, from the envelope of a letter or the verso or recto of a postcard. Points of content or style in the document which it is immediately apparent are in need of later annotation are pointed out in this section, e.g.,

clarification of obscure points requiring consultation of originals, determination of author/recipient or other persons and places named in the text, expansion of uncommon or unclear abbreviations, and clarification of confusing omissions and errors in the text.

Memorandum of Agreement

made at Princeton, New Jersey, this 22nd day of February 1971

B E T W E E N

THE ESTATE OF ALBERT EINSTEIN acting through Helene Dukas and Otto Nathan Trustees under the Will of Albert Einstein (hereinafter called the Proprietor and designated by the masculine singular pronoun)

A N D

PRINCETON UNIVERSITY PRESS, of Princeton, New Jersey (hereinafter called the Publishers)

relating to a work now entitled

THE PAPERS OF ALBERT EINSTEIN

WARRANTY

1. The Proprietor hereby grants and assigns to the Publishers the full and exclusive right during the term of copyright and renewals to publish or to cause others to publish the said work in all forms and in all languages throughout the world.

the Proprietor's

The Proprietor authorizes the Publishers to take out copyright in their name in the United States, and in other countries if they deem advisable. The Proprietor promises full and seasonable cooperation in effecting copyright renewal, which he agrees to assign to the Publishers.
Insert Paragraphs 2 - 8 (appended)

WARRANTY

9. The Proprietor represents and guarantees that he is the sole author and proprietor of the said work and that he has full power to make this agreement and grant; that the said work does not infringe the copyright or other proprietary right of any other person; and that the said work contains no libelous or other unlawful matter, and makes no improper invasion of the privacy of any other person. The Proprietor undertakes to hold harmless the Publishers from any claim, suit, or proceeding asserted or instituted on the grounds that the said work infringes such rights or contains such hurtful matter, and to indemnify the Publishers for such reasonable expenses as may be incurred in defense against such claim, suit, or proceeding.

WARRANTY

10. The Publishers agree to publish the said work at their own expense (unless otherwise specifically provided in this agreement) within a reasonable period in such form as they deem most suitable. Provided, however, that in the case of a work in substantially incomplete form at the time of this agreement, the Publishers' commitment to publish shall be contingent upon the decision of the Editorial Board of Princeton University Press when the complete manuscript is submitted that it is in form and content worthy of scholarly publication. It is to be understood that this is not a scholarly decision without reference to commercial expediency and it is also to be understood that the Editorial Board has already given general approval to the subject and plan of the work, which is to be approximately

PROTECTION

11. The Proprietor may continue to publish, or permit to be published, those of Albert Einstein's writings which were published before the date of this agreement, and translations thereof.

12. The Proprietor agrees that he will not, without the consent of the Publishers, publish any abridged or other edition of the work or any book of a similar character tending to interfere with the sale of the work covered by this agreement.

~~REVISIONS~~
OF
MANUSCRIPT

~~5. The Proprietor agrees to deliver the complete manuscript, together with all illustrations, maps, charts, drawings, or other material (except index) to be included in the work, not later than . If the Proprietor shall fail to make delivery by that date, the Publishers shall be released from all obligations under this agreement unless they have advised the Proprietor in writing of their willingness to postpone the delivery date; but the Proprietor shall not be free to cause publication of the said work elsewhere until he shall have reoffered it to the Publishers under the terms of this agreement.~~

SIZE OF
MANUSCRIPT

6. The manuscript of the work as submitted to the Publishers consists of:

In any revision which he may undertake before the work goes into production the Proprietor shall not add to the size of the manuscript or number of illustrations without the written permission of the Publishers.

FORM OF
MANUSCRIPT

7. The Proprietor agrees to present a legibly typed manuscript and illustrations, charts, etc., suitable for reproduction. If submitted in such form that editing (aside from routine "copy-reading" customary among publishers) is required, or that retyping of manuscript or redrawing or other processing of illustrations is necessary, such work shall be done by the Publishers and charged to the Proprietor's account. Unless a special request as to spelling, capitalization, punctuation, and typographic style shall be made by the Proprietor, and unless a manuscript consistently following such style shall be furnished, the Publishers are authorized to make the manuscript conform to the style which they believe to be most suitable for the work, provided, however, that the Publishers shall not be free, in the process of editing, to make substantive changes in the manuscript without the express approval of the Proprietor. The Proprietor agrees that if the book is to include an index he will prepare it promptly after page proof has been submitted, or, if he fails to do this, will compensate the Publishers for their expense in preparing the index. The Proprietor agrees to pay all permission fees (if any) for the use of text or illustrations controlled by others, and upon request to furnish the Publishers with written evidence of the copyright owner's authorization to use the material.

EDITING

INDEX

PERMISSIONS

AUTHOR'S
ALTERATIONS

8. The cost of Author's Alterations (i.e. changes from the original manuscript submitted by the author, exclusive of the cost of correcting printer's errors) made by the Proprietor in type and/or plates shall be borne by the Publishers to the extent of 10% of the cost of original composition, but beyond that amount shall be charged to the Proprietor's account. The cost of Author's Alterations in illustrations, exclusive of correction of printer's or platemaker's errors, shall be borne by the Publishers to the extent of 10% of the cost of making the original plates or negatives, as the case may be, but beyond that shall be charged to the Proprietor's account.

REVISED
EDITIONS

9. The Proprietor agrees to revise the first and subsequent editions of the work and to supply any new material necessary from time to time to keep the work up to date as may be desired by the Publishers; and in the event that the Proprietor shall neglect or be unable to make such revision or to supply such new material then to permit the Publishers to engage some other person or persons to revise the said editions or to supply such new material and to deduct the expense thereof from royalties accruing to the Proprietor on such revised and enlarged editions.

~~INSURANCE~~

12. Proprietor
10. The Publishers shall take the same care of any manuscript, illustration, or other material placed in their hands by the Author as they would of their own property, but they shall not be responsible for its loss or damage beyond the amount (if any) for which the Author requests in writing that it be insured at his expense. Proprietor

~~ROYALTIES~~

13.
11. Six months after first publication of the work, the Publishers shall prepare a royalty statement covering sales of the work to that date, and within 60 days thereafter shall pay the Proprietor the amount due. Thereafter the Publishers shall pay the Proprietor in the months of March and September of each year the royalty payable as of the preceding February 1 and August 1, respectively, covering sales during the preceding six months. Provided, however, that annual rather than semi-annual payments may be made if a semi-annual payment would be in an

amount less than \$25.00. No royalty shall be paid in any year in which less than five dollars (\$5.00) has accrued in royalties. The amount of royalty shall be calculated as follows:

of each volume

REGULAR
DOMESTIC
SALES

On book sales within the limits of the United States (except for the special cases listed below), the following stipulated percentage of the list price:

10% on the first 5,000 copies sold, 12-1/2% on the next 5,000 copies sold, 15% beyond 10,000 copies sold. This royalty scale will apply separately to each individual volume published.

FOREIGN
SALES

On book sales outside the limits of the United States, one-half the above stipulated percentage of the list price.

SPECIAL
DISCOUNTS

On sales of sheet stock or on book sales at special discounts of 50% or more from the list price, or on book sales of a special edition issued by the Publishers and retailing at less than two-thirds of the list price of the regular edition, the regular domestic royalty rate (as stipulated above) calculated on the net amount actually received by the Publishers.

REVISED
EDITIONS

In the event of publication of an abridged, expanded, or revised edition necessitating the resetting of twenty per cent or more of the work, the said edition shall be considered a new work and a new agreement shall be arranged on mutually agreeable terms.

ROYALTY-FREE
COPIES

No royalty shall be paid on any copies lost or destroyed, or on damaged or ^{STET}oversold copies sold at or below manufacturing cost, or given away for the purpose of aiding the sale of the work.

REDUCED
RATE OF
SALES

~~In any royalty payment period in which the sale of the work is less than 150 copies, the royalty shall be one-half the regular royalty rate as stipulated above.~~

PRINCETON
PAPERBACK
EDITION

If the Publishers should issue their own paperback edition of the work, the regular royalty rate shall be five per cent of the paperback list price, and the above-listed stipulations with respect to foreign sales, special discounts, ~~reduced rate of sale~~, revised editions, and royalty-free copies shall apply.

on the first 10,000 copies sold, 7-1/2% beyond 10,000 copies sold

OTHER
MATTERS

14. The Proprietor grants and assigns to the Publishers the full, sole, and exclusive right to arrange for the sale or licensing of the following rights relating to the said work, and constitutes the Publishers his representatives and attorneys-in-fact for that purpose. If such rights are sold or licensed, the Publishers shall pay to the Proprietor, at the time of the next royalty payment after receipt of the funds, the following portion of the net amount actually received for such sale or licensing:

(a) Translation, first and second serial rights, selection, abridgment, paperback, condensation, digest, adaptation, syndication, omnibus volumes, receipts from a license to another publisher to reprint in whole or in part, or from a license to a book club to manufacture its own edition for distribution to its members—50% of the net amount actually received by the Publishers.

(b) Dramatization, public reading, radio, television, and motion picture rights (sight and sound) or the right of reproduction by other mechanical devices—85% of the net amount actually received by the Publishers. The Publishers will make decisions on all the rights mentioned in this paragraph after consultation with the Proprietor.

ADDITIONAL
COPIES

15. each volume of
The Publishers shall give the Proprietor 10 free copies of the said work. For additional copies, not for resale, the Proprietor shall pay the list price less 40% discount, f.o.b. Princeton, New Jersey.

TERMINATION
BY
PUBLISHERS

16. If, after three years following the date of publication of the said work, the Publishers shall advise the Proprietor in writing to his last known address that they find it necessary to discontinue publication, or if the Publishers fail to keep the work in print and neglect to reprint it within six months of the Proprietor's written request that they do so, then the Proprietor shall have the right to terminate this agreement by written notice. Upon such notice of termination the Proprietor shall have the right at his option within 30 days of such notice to purchase at 25% of the actual cost (including composition) the type and/or plates of the work, should any exist, and to purchase at actual manufacturing cost any copies and/or sheets remaining in the Publishers' hands. If the Proprietor shall fail to exercise this option within 30 days, then the Publishers shall be free to destroy or dispose of the type and plates, if any, and to dispose of any copies and/or sheets in any way they see fit without payment of any royalty on such copies and/or sheets. Upon termination of the agreement, the Publishers agree to assign the copyright

of the said work to the Proprietor; thereupon all the then existing rights granted to the Publishers under this agreement shall revert to the Proprietor.

~~XXXXXXXXXX~~
~~AUTHOR'S~~
~~XXXXXXXXXX~~

~~The Proprietor agrees to make the Publishers the first offer of publication of his work full-length book; but if the Publishers fail to exercise this option by executing or publishing an agreement within 90 days of receipt of the completed manuscript, then the Proprietor shall be under no further obligation under this option, and shall be free to cause its publication elsewhere. The Proprietor is not obliged to accept the Publishers' offer under this option.~~

ADDITIONAL
PROVISIONS

17. In case of disagreements between Proprietor and Publishers for which they cannot find a solution themselves, the controversial matter will be submitted to the American Arbitration Association whose decision will be binding upon both parties.

18. The Proprietor makes and enters into this agreement in the fiduciary capacity as above described and not personally, and accordingly no liability or obligation arising hereunder shall attach or may under any circumstances be enforced against the individuals personally, but only in their trustee-ship capacity. This agreement may not be changed or terminated orally.

~~XXXXXXXXXX~~
~~XXXXXXXXXX~~
~~XXXXXXXXXX~~

19. This agreement shall be binding upon and inure to the benefit of the heirs, executors, administrators, and assigns of both parties.

This agreement may be assigned by either party with the written consent of the other, which consent must be obtained in advance, and the assignee thereof shall have all the rights and remedies of the original parties insofar as the same are assignable. But this agreement shall be assigned only as a whole and not as a part, nor as to any part interest therein.

IN WITNESS WHEREOF, the Proprietor has hereunto placed his hand and seal, and the Publishers have caused this agreement to be executed and their seal to be affixed by authority of their Board of Trustees.

.....
WITNESS TO PROPRIETOR'S SIGNATURE

..... (L.S.)
PROPRIETOR SIGN HERE

PRINCETON UNIVERSITY PRESS

.....
WITNESS TO PUBLISHER'S SIGNATURE

by (L.S.)

MEMORANDUM
OF
AGREEMENT

THE ESTATE OF ALBERT EINSTEIN

AND

PRINCETON UNIVERSITY
PRESS

THE PAPERS OF

ALBERT EINSTEIN

Insert, Paragraphs 2 - 8, on p. 1 of Appendix B

2. The work will be performed with the editorial cooperation of the Institute for Advanced Study, which houses the Einstein archives. See also Paragraph 8.

3. To assure the scientific and scholarly quality of the editorial work, the Proprietor and the Publishers agree jointly to appoint, in consultation with the Institute for Advanced Study, an Editorial Advisory Board of not less than seven persons or such larger number as may be agreed upon by the Parties from time to time. Vacancies on the Board will be filled in the same way as the original appointments to the Board.

4. On the advice of the Editorial Advisory Board, the Proprietor and the Publishers will jointly appoint the Editor, who will have the primary responsibility of organizing and preparing the material for publication, including any necessary copyright clearances. The Editor may appoint, with the consent of the Proprietor and Publishers, associate editors or assistant editors for individual volumes or series of volumes.

5. The Work is understood to include the complete writings of Albert Einstein, published and unpublished, scientific and non-scientific, including correspondence, except for such papers as the Proprietor finds it necessary to withhold for reasons of privacy. Standards of editorial selection shall be determined by the Editor in consultation with the Editorial Advisory Board.

6. All documents included in the basic edition of the Work shall be incorporated in their original languages. Other editions will be published at the discretion of the Publishers after consultation with the Editorial Advisory Board and the Proprietor. The publishers agree to grant a royalty-free license to The Hebrew University, Jerusalem, Israel, to publish a Hebrew-language edition at their own expense.

7. Publishing costs after preparation of manuscripts suitable for the printer will be borne by the Publishers. Editorial costs for preparation of manuscripts will be paid from funds raised especially for the purpose and deposited with, and administered by, the Publishers (a non-profit corporation, to which contributions are tax-deductible); the Proprietor and the Publishers agree jointly to seek contributions for this purpose. An annual budget for the editorial work will be drawn up and mutually approved by the Proprietor and the Publishers. During the budget year the Publishers will have authority to approve changes in the provisions of the budget for editorial expenses. The Publishers shall prepare an annual accounting of income and expenditure and shall submit a copy of that accounting to the Proprietor. Any surplus of the funds raised that may be left after completion of the editorial work will be used to further the ideas and ideals of Albert Einstein upon joint decision by the Proprietor and the Publishers, but such use will be restricted to tax-exempt purposes.

8. Other institutions or individuals may be enlisted in the effort to carry out this project, as sponsors or otherwise, by mutual agreement of the Proprietor and the Publishers.

Members of the Editorial Advisory Board of the Einstein Papers

Valentine Bargmann
87 S. Stanworth Drive
Princeton, NJ 08540

Peter Bergmann
Department of Physics
Syracuse University
Syracuse, NY 13210

Marshall Clagett
School of Historical Studies
Institute for Advanced Study
Princeton, NJ 08540

Freeman J. Dyson
School of Natural Sciences
Institute for Advanced Study
Princeton, NJ 08540

Banesh Hoffmann
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Gerald Holton
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Martin J. Klein
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Yale University
Box 2036 Yale Station
New Haven, CT 06520

Shmuel Sambursky
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Sciences and Humanities
P.O. Box 4040
Jerusalem 91040, Israel

Charles Scribner, Jr.
Charles Scribner's Sons
597 Fifth Avenue
New York, NY 10017

John A. Wheeler
Director, Center for Theoretical
Physics
University of Texas at Austin
Austin, TX 78712

Harry Wolf
Director, The Institute for
Advanced Study
Princeton, NJ 08540

Princeton University Press PRINCETON, NEW JERSEY 08540 (TEL. 609-452-4900)

President, HAROLD W. MC GRAW, JR. *Trustees*, CYRIL E. BLACK, JOHN TYLER BONNER,
WILLIAM G. BOWEN, ROBERT C. DARNTON, ROBERT G. GILPIN, WU-CHUNG HSIANG,
ALVIN B. KERNAN, DONALD W. KOEPP, AARON LEMONICK, RICARDO A. MESTRES,
JOHN F. PECKHAM, ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT

September 10, 1981

Professor John Stachel
Institute for Advanced Study
Princeton, New Jersey 08540

Dear Professor Stachel:

1. Purpose

The purpose of this letter is to set forth the terms of your appointment as Editor of The Papers of Albert Einstein.

The appointment was made jointly by the Trustees under the Will of Albert Einstein (Einstein Trustees) and Princeton University Press (Press). The terms of your appointment are governed by the provisions of this contract as well as by the agreement between the Einstein Trustees and the Press, dated February 22, 1971, and by the Last Will and Testament of Albert Einstein dated March 18, 1950. You have received copies of both documents and are familiar with their contents.

2. The Nature of the Edition and Your Duties and Responsibilities

You will have the primary responsibility for collecting, organizing, and preparing the material for publication of The Papers of Albert Einstein, comprising the complete works of Albert Einstein, published and unpublished,



scientific and non-scientific, including correspondence. As Editor, you will be the manager of the Einstein Office (see paragraph 4). You are to prepare typewritten manuscripts or suitable printer's copy for volumes for a complete, accurate and scholarly edition, with sufficient annotation to make the work clear and maximally useful to scholars and scientists and, where appropriate, to the general public, and you will cooperate with the Einstein Trustees and the Press, and do all things reasonably necessary, to enable them to carry out their agreement of February 22, 1971.

Under the agreement of February 22, 1971 between the Press and the Einstein Trustees, the Proprietor (the Einstein Trustees) and the Publishers (the Press) have appointed an Editorial Advisory Board to assure the scientific and scholarly quality of the editorial work. It is understood that you will, after consultation with the Einstein Trustees and the Press, appoint an Editorial Committee to be available for consultation at your request. You will select the members of the Editorial Committee yourself with the proviso, however, that no person can serve simultaneously on the Editorial Advisory Board and the Editorial Committee. Any agreements between you and members of the Editorial Committee concerning but not limited to, matters such as compensation and acknowledgements for work to be performed, must be approved by the Press, as the administrator of the project.

The Edition is to be in the original languages in which the material was written. The Press, with your advice and the advice of the Editorial Advisory Board, and upon consultation with the Einstein Trustees, will decide what material should be translated into English. The preparation of English translations for inclusion integrally, or in separate volumes, will be your responsibility.

The format of the printed volumes will be the responsibility of the Press, which will consult with you on questions of design and typography. You will read proofs, check diagrams, and perform other customary editorial duties. The volumes prepared under your Editorship will not be printed without your approval of page proof; if you should be unable or unavailable to approve proof, the Press will take the responsibility of doing so.

Notwithstanding the foregoing, you will not be legally responsible for any claims or actions brought by third parties, and the Einstein Trustees and the Press agree to indemnify you against all expenses, including reasonable attorneys fees, resulting from claims and actions of any kind by third parties (except for material which you have yourself written), based upon the publication of The Papers of Albert Einstein during the term of this agreement and thereafter.

3. Submission of Reports and Selection of
Materials

(a) At the end of each annual period during the term of your appointment, you will prepare and submit to the Einstein Trustees, the Editorial Advisory Board and the Press a memorandum summarizing your work on the project during such annual period, a brief discussion of your plans for work during the ensuing year and a summary of any proposed change in your general plan of the intended Edition, the foregoing to be subject to discussion with the Einstein Trustees, the Press, and the Editorial Advisory Board.

(b) The Einstein Trustees and the Press desire that The Papers of Albert Einstein contain as complete a collection of Einstein's writings as possible. However, the Einstein Trustees shall have the right to withhold from publication such papers as they find, in their discretion, should be withheld for reasons of privacy. Except for such reasons, the determination of material to be included in the volumes shall be within your province, except that nothing shall be included that libels or infringes on the rights (such as rights of privacy and copyright) of others. It shall be your duty to obtain publication rights of all materials to be included in the Edition, with the cooperation of the Press and the Einstein Trustees. You will bring to the attention of the Press any material about which there are doubts

regarding publication rights. If legal problems arise, you will consult the Press and the Press will take final responsibility as to what shall be printed. Legal expenses shall be part of the expenses of the Einstein Office.

4. The Einstein Office

It is understood that the editorial work will be done as far as possible on the basis of the duplicate archive and not by using the original material, which, when he deems it necessary, and if available, shall be examined only by the Editor. In addition, at the Institute for Advanced Study (the "Institute") at Princeton University, at the Press, or elsewhere, an Einstein Office will be established to facilitate the work. The location of the Einstein Office shall be selected jointly by you and the Press, as administrator of the project. The duplicate archive will be kept in the Einstein Office. As Editor, you will be the manager of the Einstein Office. It is the responsibility of the Einstein Trustees and the Press, under their basic agreement of February 22, 1971, to provide funds to be sought from foundations and private donors. You will, however, when reasonably requested to do so, assist in the preparation of applications for financial grants and funding. The application for and management of such funds shall be the responsibility of the Press or the joint responsibility of the Institute and the

Press under arrangement to be made between them, such arrangement being subsidiary to the basic contract between the Einstein Trustees and the Press. Thus the staff of the Einstein Office, under grants received, will be employees of either the Institute or the Press, depending on arrangements for specific grants. The employment of such staff will be in accordance with budgets submitted to the granting agencies; such applications will be reviewed in advance by the Institute (if a participant in this project), the Press, and the Einstein Trustees. The appointment of associate editors and assistant editors shall be subject to the approval of the Einstein Trustees and the Press: If the Institute is the employing institution, its approval shall also be required. It is further understood that you will draw up an annual budget for the editorial expenses to be submitted for approval to the Einstein Trustees and the Press. This annual budget will include relevant portions of all grants-budgets and will constitute a comprehensive budget for the project.

5. The Term of your Appointment

You assumed your functions under this appointment on January 15, 1977. Your appointment will continue until completion of the project, and shall be subject to termination after January 1, 1982, at the joint option of the Einstein Trustees and the Press upon not less than six (6)

months prior written notice to you or, at your option, upon not less than six (6) months prior written notice to the Einstein Trustees and the Press.

6. Miscellaneous

(a) The Papers of Albert Einstein, including all the products of your own work and writings, as well as those of the editorial staff, will be copyrighted in the United States and abroad, in the name of the Estate of Albert Einstein which will be responsible for any renewal of copyrights. This provision does not apply to such professional writings as you may do on Einstein or related subjects, for publication elsewhere than in The Papers of Albert Einstein. You will cooperate in effecting copyright and copyright renewals and, whenever requested, you will execute and provide further instruments as may become necessary to obtain copyright or copyright renewals.

(b) The rights of the Press to publish, in addition to the basic Einstein edition, an abridged edition, translations, anthologies and other derivative works are herewith confirmed as stipulated in the agreement between the Einstein Trustees and the Press. You will be consulted on all these derivative works, together with the Editorial Advisory Board and the Einstein Trustees. Separate arrangements between yourself, the Press and the Einstein Trustees will

be made in regard to the distribution of royalties on all derivative works, with due consideration to the pertinent provisions of Article 14 of the agreement between the Press and the Einstein Trustees. No royalties will be payable to you on the basic Einstein edition.

(c) You will cooperate with the Einstein Trustees and the Press in the sale, advertisement and promotion of The Papers of Albert Einstein and consent that in connection therewith, they may use your name, photograph, and biographical sketch, which you agree to supply from time to time on their request. You will be compensated for any reasonable expenses you may incur in connection with promotional activities which you may be asked by the Press to perform at mutually convenient times on behalf of The Papers of Albert Einstein.

7. The Financial Obligations of the Project

The Einstein Trustees make and enter into this Agreement only in their fiduciary capacity as Trustees under the Will of Albert Einstein, and not personally, and accordingly no liability or obligation arising hereunder may attach or may, under any circumstances, be enforced against them personally. Your salary will be equal to that which you would have been paid for a twelve-month year by Boston University, were you not on leave. In addition, since you will be on leave

from Boston University, your fringe benefit program will be paid to the same extent that Boston University would pay you were you on active duty there. If and when you return to your teaching duties at Boston University on a part-time basis, your salary and fringe benefits will be paid in proportion to the time spent on The Papers of Albert Einstein. If you should change your academic affiliation, similar arrangements on salary and fringe benefits will be made, but such change shall not result in any other change in the terms of this agreement. It is understood that you are to be engaged in editing The Papers of Albert Einstein on a full-time basis, with one month's vacation annually, regardless of the terms or payment periods of your academic employer.

8. Arbitration

If we should be unable to reach agreement upon any controversy or problem arising out of or relating to your appointment hereunder, the matter shall be settled by arbitration in accordance with the rules, then obtaining, of the American Arbitration Association. If, at the time an arbitration proceeding is commenced pursuant to this Agreement, you have resumed your teaching duties at Boston University, your testimony at such proceeding may be taken by oral deposition in Boston.

9. Third Party Grants

In the event any outside financial assistance is obtained relating to any of the matters herein, including but not limited to, assistance by grant of private parties or government agencies, the parties to this agreement will investigate the terms on which such aid is offered and will take no action inconsistent with the terms of this agreement.

10. Other Understandings

(a) In the event the Einstein Trustees do not sign this agreement, it is expressly understood that the Press does not assume their obligations nor warrant the performance thereof as set forth herein.

(b) It is expressly understood that in the event the award of the arbitrator dated July 18, 1980 is set aside or modified in any respect, this agreement shall be deemed null and void.

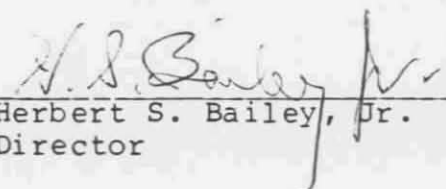
(c) We have attempted, in the above paragraphs, to set forth the terms of your appointment as Editor of The Papers of Albert Einstein, in a way that will be satisfactory and clear to everyone, with the full appreciation that this is a great project in which the Editor must be the primary shaping force. We realize that it is impossible to anticipate all problems that may arise and we expect to rely heavily on

your judgment, and at the same time have attempted to provide reasonable methods for resolution of any disagreement.

If you agree to the terms set forth above, will you please sign the enclosed copies of this letter and return them to us.


Sincerely yours,

PRINCETON UNIVERSITY PRESS

By 
Herbert S. Bailey, Jr.
Director

(_____
(Helena Dukas
(_____
(_____
(_____
(Otto Nathan
(_____
(as Trustees under the Last
(Will of Albert Einstein, deceased

AGREED:


John Stachel

SEPT. 10, 1981
Date

JOHN STACHEL
VITA

EDUCATION

- B.S.: City College of the C.U.N.Y., 1956
M.S.: Stevens Institute of Technology, 1959
Ph.D.: Stevens Institute of Technology, 1962

PROFESSIONAL HISTORY

- Lehigh University: Instructor of Physics, 1959-61
University of Pittsburgh: Instructor of Physics, 1961-62
Research Associate, 1962-64
Boston University: Assistant Professor of Physics, 1964-69
Associate Professor of Physics, 1969-72
Professor of Physics, 1972-
Director, Institute for Relativity Studies, 1972-

VISITING POSTS

- Institute for Theoretical Physics, Warsaw: Visiting Research Associate,
one half-year, 1962.
Temple University Relativity Group: Research Associate, Summers of 1965,
1966, and 1968.
Centro de Investigacion y de Estudios Avanzados del I.P.N., Mexico:
Visiting Professor, summers of 1966, 1967, 1980 and 1981.
King's College, University of London: Visiting Professor, 1970-71 academic
year, and summer 1981.
Institut Henri Poincaré, Paris: Visiting Professor as guest of the C.N.R.S.,
April-May 1971.
International Center for Theoretical Physics, Trieste: Visiting Scientist,
summer, 1972.
Institute for Theoretical and Applied Mechanics, University of Paris VI:
Exchange Professor, January 1974.
Institut des Hautes Etudes Scientifiques, Bures, France: Visiting Professor,
March 1974.
Princeton University: Visiting Senior Research Fellow, Department of Physics,
Joseph Henry Laboratories, 1977-

PUBLICATIONS

Articles:

- "Cylindrical Gravitational News," J. Math. Phys., 7, 1321 (1966).
- "Einstein Tensor and Spherical Symmetry," J. Math. Phys., 9 (1968), with J. Plebanski
- "Structure of the Curzon Metric," Phys. Letters, 27A, 60 (1968).
- "Comments on 'Causality Requirements and the Theory of Relativity'" in R.S. Cohen and M.W. Wartofsky (eds.), Boston Studies in the Philosophy of Science, V, p.96 (Reidel, 1969).
- "Behavior of Weyl-Levi Civita Coordinates for a Class of Solutions Approximating the Schwarzschild Metric," Nature, 219, 1346 (1968).
- "Perturbations of an Arbitrary Spherically Symmetric Metric," Nature, 220, 5169 (1968).
- "The Pure Radiation News Function in General Relativity," Phys. Rev., 179, 1251 (1969).
- Covariant Formulation of the Cauchy Problem in Generalized Electrodynamics and General Relativity," Acta Physica Polonica, 35, 689 (1969).
- "Specifying Sources in General Relativity," Phys. Rev., 180, 1256 (1969).
- "Invariances of Approximately Relativistic Lagrangians and the Center-of-Mass Theorem I," with P. Havas, Phys. Rev. 185, 1636 (1969).
- "Einstein Tensor and 3-Parameter Groups of Isometries with 2-Dimensional Orbits," with H. Gönner, J. Math. Phys., 11, 3358 (1970).
- "External Sources in General Relativity," GRG Journal, 3, 257 (1972).
- "Comments on Two Papers in Quantum Mechanics," in R.S. Cohen and M.W. Wartofsky (eds.), Logical and Epistemological Studies in Contemporary Physics, Boston Studies in the Philosophy of Science, XIII, p. 214, p. 309 (Reidel, 1973).
- "The Rise and Fall of Geometrodynamics," in K. Schaffner and R.S. Cohen (eds.), Proceedings of the 1972 Biennial Meeting, Philosophy of Science Association, Boston Studies in the Philosophy of Science, XX, p. 338 (Reidel, 1973).
- "Introduction to Symposium on 'Current Problems in Cosmology'" in R.S. Cohen and R.J. Seeger (eds.), AAAS Symposium on Philosophy - 1969, Boston Studies in the Philosophy of Sciences, XI (Reidel, 1974).
- "A Note on Scientific Practice," in R.S. Cohen, J. Stachel, M.W. Wartofsky (eds.), For Dirk Struik, Boston Studies in the Philosophy of Science, XV (Reidel, 1974).
- "Space-time Problems," review of General Relativity, Papers in Honor of J.L. Synge in Science, 180, 292 (1973).

- "Invariance of Approximately Relativistic Hamiltonians and the Center-of-Mass Theorem," Phys. Rev., D13, 1598 (1976).
- "The 'Logic' of Quantum Logic," in PSA 1974: Proceedings of the 1974 Biennial Meeting of the Philosophy of Science Association, Boston Studies in the Philosophy of Science, CI (Reidel, 1976). pp.515-526.
- "Comments on 'Some Logical Problems Suggested by Empirical Theories' by Professor Dalla Chiara," in Logic, Language and Method, Boston Studies in the Philosophy of Science, XXXI (Reidel, 1982), pp.91-102.
- "Center of Mass Theorem in Post-Newtonian Hydrodynamics," Phys. Rev., D14:4, 917 (1976) with T. Pascoe and P. Havas.
- "A Variational Principle Giving Gravitational 'Superpotentials,' the Affine Connection, Riemann Tensor and Einstein Field Equations," GRG Journal: General Relativity and Gravitation, 8, 705 (1977).
- "A New Lagrangian for the ^{Vacuum} Einstein Equations, and its Tetrad Form" with A. Papapetrou GRG Journal 9, No. 12 (1978), pp. 1075-1087.
- "Classical Particles with Spin. I: The WKB Approximation," with J. Plebanski, Journal of Mathematical Physics, 18, 2368 (1977).
- Review of "Ideology of/in the Natural Sciences," edited by Hilary Rose and Steven Rose, in The Sciences, October 1977.
- "String Matter: Perfect Dust and Hydrodynamics," Abstracts of Contributed Papers, 8th International Conference on General Relativity and Gravitation, August 7-12, 1977, University of Waterloo, Waterloo, Ontario, Canada.
- "Achille Papapetrou," GRG Journal 8, 541 (1977).
- "Notes on the Andover Conference," Minnesota Studies in the Philosophy of Science, vol. VIII Foundation of Space-Time Theories, (U. Minn. Press, 1977), pp.vi
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- "Conformal Two-Structure as the Gravitational Degrees of Freedom in General Relativity," with R. d'Inverno, J. Math. Phys. 19, 2447-2460 (1978).
- "Einstein's Odyssey," in The Sciences, March 1979, 19, 14,15,32-34.
- "Einstein on Civil Liberty," Rights 25, 6 (1979).
- "The Genesis of General Relativity," in H. Melkowski et al. (eds.), Einstein Symposium Berlin (Lecture Notes in Physics, vol. 100), Springer-Verlag, Berlin, Heidelberg, New York, 1980), pp. 428-442.

John Stachel - 4

- "Einstein and the Rigidly Rotating Disc," in A. Held et al. (eds.), General Relativity and Gravitation, Vol. I (Plenum, New York, 1980), pp. 1-15.
- "String Dusts, Fluids, and Subspaces," preprint to appear in Laszlo Tisza Festschrift (MIT Press, 1982).
- "Thickening the String I: String Dusts," Phys. Rev. D, Vol. 21, No. 8 (15 April 1980) pp. 2171-2181.
- "Thickening the String II: The Null String," Phys. Rev. D, Vol. 21, No. 8 (15 April 1980), pp 2182-2184.
- "The Anholonomic Cauchy Problem in General Relativity," J. Math. Phys. 21(7), (July 1980), pp. 1776-1782.
- "If Maxwell Had Worked Between Ampere and Faraday," Am. J. Phys. 48, p. 5 (1980).
- Review of Quantum Logic by Peter Mittelstaedt, Isis, 71:1:256 (1980), p. 162.
- Review of Wolfgang Pauli: Scientific Correspondence with Bohr, Einstein, Heisenberg, Nature, 285 (12 June 1980), pp. 515-516.
- Review of The Greatest Power on Earth: The Story of Nuclear Fission by Ronald Clark, Nature 290, 695 (1981)
- "Einstein's First Derivation of Mass-Energy Equivalence," with R. Torretti, to appear in American Journal of Physics.
- "Einstein and Michelson: The Context of Discovery and the Context of Justification," Astronomische Nachrichten 303, pp.47-53 (1982).
- "Do Quanta Need a New Logic?," preprint to appear in Univ. of Pittsburgh Series in the Philosophy of Science.
- "Marx's Critical Concept of Science," preprint to appear in Ciencia y Produccion, (Terranova, Mexico, 1982).

John Stachel - 5

"Globally Stationary but Locally Static Space-Times: A Gravitational Analog of the Aharonov-Bohm Effect," Physical Review D, to appear.

"The Gravitational Fields of Some Rotating and Non-Rotating Cylindrical Shells of Matter," preprint.

"Albert Einstein: The Man Beyond the Myth," Bostonia Magazine 56, pp. 8-17 (1982).

Review of General Relativity: An Einstein Centenary Survey, General Relativity and Gravitation 14, pp.107-108 (1982).

"Special Relativity From Measuring Rods," to appear in Grünbaum Festschrift (Reidel, 1983).

Theses:

- "Energy Flow in Cylindrical Gravitational Waves," (M.S. thesis, Stevens Institute of Technology, 1959).
- "The Lie Derivative and the Cauchy Problem in the General Theory of Relativity," (Ph.D. thesis, Stevens Institute of Technology, 1962).

Abstracts of APS Talks:

- "New Solutions to the Einstein Field Equations," Bull. Am. Phys. Soc., 6, 305 (1961).
- "Variational Principle and Conservation Laws in Post-Newtonian Hydrodynamics," Bull. Am. Phys. Soc., 14, 69 (1969), with T. Pascoe.
- "Bohm-Aharonov Effect and its Gravitational Analogue," Bull. Am. Phys. Soc., 14, 16 (1969).
- "Quasi-Newtonian Approximation Method in General Relativity," Bull. Am. Phys. Soc., II, 15, 881 (1970), with G. Gonzalez.
- "Variational Principles as a Basis for Approximation Methods in General Relativistic Hydrodynamics," Bull. Am. Phys. Soc. II, 15, 882 (1970).

Editorial Work:

"Selected Problems in General Relativity," by C. Møller, in Brandeis University 1960 Summer Institute in Theoretical Physics Lecture Notes, notes by J. Stachel and L. Pande.

Proceedings of the International Conference on Relativistic Theories of Gravitation, Warsaw, 30-31 July 1962, edited by J. Stachel and others [Gauthier Villars and PWN, (1964)].

For Dirk Struik, Boston Studies in the Philosophy of Science, XV , edited by J. Stachel and others (Reidel, 1974).

Selected Papers on History and Philosophy of Science, by Leon Rosenfeld in Boston Studies in the Philosophy of Science, edited by J. Stachel and R.S. Cohen (Reidel, 1978).

Foundations of Space-Time Theories, Minnesota Studies in the Philosophy of Science, 8 with J. Earman and C. Glymour (University of Minnesota Press, 1977).

Editor, Collected Works of Albert Einstein. To be published by Princeton University Press.

Conference Organization:

Organized Symposium on "Current Problems in Cosmology," at 1969 Boston Meeting of the AAAS.

Member, since 1972, of the Organizing Committee for biennial "Texas" Conferences in Relativistic Astrophysics, held in New York (1972), Dallas (1974) and Boston (1976), Munich (1978), Baltimore (1980).

Organizer, Boston University Institute of Relativity Studies Conference on "Gravitation and Quantization," held at B.U. Conference Center, Andover, Mass., October 31-November 3, 1972 (See report on Conference in Nature, 240 (Dec. 15, 1972).

Organizer, Boston University Institute of Relativity Studies Conference on "Absolute and Relational Theories of Space and Space-Time," held at B.U. Conference Center, Andover, Mass., June 3-5, 1974. (Proceedings to be published jointly with those of a similar conference at the University of Minnesota, by the University of Minnesota Press.)

Chairman, Local Organizing Committee for the Eighth "Texas" Symposium in Relativistic Astrophysics, Boston, December 13-17, 1976. (Proceedings to be published by the New York Academy of Science.)

Organizing Session of the AAAS meeting, Section L, on "The Einstein Centenary: I. Progress, Problems and Prospects in General Relativity; II. Topics in the History of General Relativity." Held January 1979 in Houston, Texas.

Courses Taught:

Undergraduate

Physics for the Life Sciences
Electricity and Magnetism
Einstein: The Man, The Times, The Achievement
Modern Physics and Political Problems
Vibrations and Waves

Graduate

Quantum Mechanics
Thermodynamics
Electrodynamics
Special and General Relativity
Seminar in Relativity
Classical Mechanics

Reviewer for:

Articles: Annals of Physics, American Journal of Physics, Physical Review,
GRG Journal, Nuclear Physics.

Research Proposals: NSF Division of Theoretical Physics, Division of History
and Philosophy of Science, Latin American Cooperative Science Program;
CUNY Faculty Research Award Program, Guggenheim Fellowships Program.

Member

Governing Committee, International Society on General Relativity and Gravitation.

APPENDIX G

RESUMÉ

Robert John Schulmann
Date of birth: March 8, 1942
Place of birth: Bacolod, Philippines
Address: 103 Moore St., Princeton, N.J. 08540
Telephone: (609) 921-6452 (Home)
(609) 452-5408 (Office)

Current position:

Staff Historian, Albert Einstein Papers, 1981-

Teaching Experience:

Assistant Professor, University of Pennsylvania
History Dept., Modern Germany, 1980-1981
Assistant Professor, California State University,
Chico History Dept., French Revolution, Napoleon
and 19th-century France, Spring 1971
Lecturer in History, University of California,
Riverside History Dept., Modern Europe, 1969-1970

Editing Experience:

Associate Editor, General von Steuben Papers
project located at University of Pennsylvania,
1976-1981
Intern, University of South Carolina, Institute
for Historical Editing, Summer 1976

Archival Experience:

Extensive search in American and European archives,
collecting material for Steuben Papers project;
devised control system for and guide to Steuben
duplicate archive at the University of Pennsylvania

Education:

University of Chicago; 1965-1967 and Spring 1973
Ph.D., June 1973

Primary field: Early Modern European Social History
with emphasis on comparison of bureaucracies in
Europe and America, 18th and 19th centuries

Dissertation: Tradition and Reform in German Klein-
staaten and the Response to Industrialization
(1790-1840)

Honors: Fellow of the University of Chicago, 1966-1967
German Academic Exchange Fellow, 1967-1968
Fellow of Institute for European History in
Mainz, 1973-1975

Resumé (cont.)

University of California, Riverside; 1959-1965
Master of Arts, June 1965
Bachelor of Arts, June 1964

Primary field: History Minor field: Politics
Honors Thesis: The Politics of Indecision: Walther
Rathenau and the Weimar Republic

Languages:

Bilingual in German and English; excellent knowledge
of written French and good working knowledge of Latin

Publications:

An article, based on a chapter in my dissertation,
entitled "The Impact of Military Recruitment on
German Labor and Emigration in the 19th Century,"
scheduled to appear in The Journal of Modern History,
1983

The Zeitschrift für Sozialgeschichte has asked me to
submit an article on industrialization, emigration
and the military in Germany, by the end of 1983

"Conservatives as Innovators: The Case of General von
Steuben and the American Military in the Revolutionary
War," Acta of the XV International History Conference,
vol. 4 (Bucharest, August 1980)

"The Question of Innovation in American Strategic
Doctrine during the Revolutionary War," Paper presented
to the U.S. Commission on Military History, Washington,
D.C., October 1980

"Enlightened Bureaucracies in the European and American
Military in the Early 19th Century," Paper presented to
the U.S. Commission on Military History, October 1979

Editor (with Prof. Edith von Zemenszky), The Papers of
General Friedrich Wilhelm von Steuben in America,
7 reels of microfilm, to be published in the fall of 1982

Olga M. Griminger
325 North 4th Ave., Highland Park
New Jersey 08904
(201) 249-0556

Education

BS- University of Illinois, Major: French; 1954
MS- University of Illinois, School of Library Science, 1955
Additional:
Rutgers University, Graduate School of Library & Information Studies:
Courses in Multimedia Instructional Materials, 1975
Courses in Reference and Cataloging, 1979
Introductory Computer Course, Hill Center, 1981

Experience

1980-1981 Research Assistant, Center of Alcohol Studies, Rutgers University (proof-reading, classifying, indexing, abstracting, copy-editing and editing for The Journal of Studies of Alcohol on paper and on a word processor, occasional computer searches)

1980 Bibliographer, Institute on Aging, Rutgers University (prepared two major bibliographies which were subsequently published by the Institute)

1972-78 Assistant Librarian, Highland Park High School

1960-62 Translator, scientific articles, free-lance and government agencies

1957-present organizer, scientific reprint collection of ca 15,000 items, Rutgers University

1955-57 Director, Base Library, US Air Force Base, Lincoln, Nebraska (staff supervision, budget, technical services, circulation, reference, book selection)

1953-55 Assistant Librarian, Illinois State Natural History Survey Library (bibliographies, research, reference, technical services, circulation)

1952-53 Cataloger, Russian Materials, University of Illinois Library

Languages

Russian - fluent
German - fluent
French - working knowledge

Professional Affiliations

American Library Association
NJ Boards of Public Libraries Trustees Association

Honorary Positions

Member of the Board of Trustees, Highland Park Public Library
Member of the Executive Council, Center of Alcohol Studies, Rutgers
University

Publications

Cultural Perspectives on Aging; an annotated bibliography. Rutgers
University, Institute on Aging, 1980.

Menopause; an annotated bibliography. Rutgers University, Institute
on Aging, 1980

The Collected Papers and Correspondence of Albert Einstein
 Research Grant Proposal Budget for
The Five Years Ending October 31, 1987

	Notes	Year Ending October 31					Total
		1983	1984	1985	1986	1987	
A. Senior Personnel							
1. Editor (Professor Stachel)--	1						
Salary		\$ 50,000	\$ 54,500	\$ 59,400	\$ 64,700	\$ 70,500	\$ 299,100
Fringe Benefits		10,500	11,400	12,500	13,600	14,800	62,800
B. Other Personnel							
1. Associate Editor--	2						
Salary		45,000	49,100	53,500	58,300	63,500	269,400
Fringe Benefits		9,000	9,800	10,700	11,700	12,700	53,900
2. Assistant Editors (2)--							
Salary		60,000	65,400	71,300	77,700	84,700	359,100
Fringe Benefits		12,000	13,100	14,300	15,500	16,900	71,800
3. Editorial Assistant--							
Salary		18,000	19,600	21,400	23,300	25,400	107,700
Fringe Benefits		3,600	3,900	4,300	4,700	5,100	21,600
		<u>\$ 208,100</u>	<u>\$226,800</u>	<u>\$247,400</u>	<u>\$269,500</u>	<u>\$293,600</u>	<u>\$1,245,400</u>
D. Permanent Equipment	3	\$ 65,000	\$ --	\$ --	\$ --	\$ --	\$ 65,000
E. Travel--	4						
Domestic		\$ 4,500	\$ 1,100	\$ 1,200	\$ 1,300	\$ 1,500	\$ 9,600
Foreign		10,000	--	--	--	--	10,000
		<u>\$ 14,500</u>	<u>\$ 1,100</u>	<u>\$ 1,200</u>	<u>\$ 1,300</u>	<u>\$ 1,500</u>	<u>\$ 19,600</u>
G. Other Direct Costs--							
Computer Services	5	\$ 1,000	\$ 6,600	\$ 7,300	\$ 8,000	\$ 8,800	\$ 31,700
Other--							
Office Rent	6	14,400	15,800	17,400	19,200	21,100	87,900
Office Utilities	6	2,500	2,800	3,000	3,300	3,600	15,200
Other Office Expenses	7	7,300	5,800	6,400	7,100	7,800	34,400
Fire Alarms System	8	5,000	1,100	1,200	1,300	1,500	10,100
Editorial Committee Expenses	9	9,400	5,700	3,700	4,100	4,500	27,400
		<u>\$ 39,600</u>	<u>\$ 37,800</u>	<u>\$ 39,000</u>	<u>\$ 43,000</u>	<u>\$ 47,300</u>	<u>\$ 206,700</u>
I. Indirect Costs (24%)	10	<u>\$ 41,500</u>	<u>\$ 45,300</u>	<u>\$ 49,300</u>	<u>\$ 53,800</u>	<u>\$ 58,600</u>	<u>\$ 248,500</u>
Total Budget		<u>\$ 368,700</u>	<u>\$311,000</u>	<u>\$336,900</u>	<u>\$367,600</u>	<u>\$401,000</u>	<u>\$1,785,200</u>
Less Institutional Cost Sharing (Editor)		<u>60,500</u>	<u>65,900</u>	<u>71,900</u>	<u>78,300</u>	<u>85,300</u>	<u>361,900</u>
Amount Requested From NSF		<u>\$ 308,200</u>	<u>\$245,100</u>	<u>\$265,000</u>	<u>\$289,300</u>	<u>\$315,700</u>	<u>\$1,423,300</u>

PRINCETON UNIVERSITY PRESS

Notes To Budget

1. The salary and fringe benefits of Professor Stachel, the Editor, will be paid from a one million dollar endowment received from Mr. Harold McGraw.
2. The budget allows for a 9% salary increase annually for the Associate Editor, the two Assistant Editors, and the Editorial Assistant. Fringe benefits are budgeted at 20% of salary, the current average percent applicable to Princeton University Press personnel, and is comprised of the following:

Pension and social security	15%
Medical Insurance	4
Group Life Insurance, Long-Term Disability Insurance	1
	<u>20%</u>

3. Permanent equipment expenditures include:
 - 1) the estimated cost (\$60,000) of the word processing system discussed in the section of the proposal on Word Processing Requirements.
 - 2) \$5,000 for the purchase of five four-drawer fireproof file cabinets to house the editorial duplicate copy of the Einstein Archive.
4. The major part of the travel costs within the United States as well as all the travel abroad budgeted for 1982/83 covers trips in search of documents to add to the Einstein Archive.
5. Beginning in the second year, computer services include the cost of a maintenance contract for the word processing system, estimated at \$5,500 in 1983/84.
6. Beginning in the Fall of 1982, the Einstein Office is expected to be housed in newly renovated quarters located on the grounds of The Institute for Advanced Study. Annual rent for the Project offices - consisting of 1,200 square feet - has been set at \$14,400 by the Institute for the first year. Utilities- heat, light, and water - will be additional.
7. The "Other Office Expenses" budget for 1982/83 includes the following:

Office supplies	\$ 400
Postage (regular)	700
Postage (special)	2,000
Photocopying	1,500
Telephone and telegraph	1,200
Books, Subscription, etc.	500
Fire insurance on contents of Einstein Office	<u>1,000</u>
	<u>\$7,300</u>

"Special" postage (budgeted for 1982/83 only) covers an extensive mail search for additional documents to add to the Einstein Archive.

8. Smoke and heat sensing devices are expected to be installed in the rented space, and wired to an outside alarm service (ADT).
9. Budgeted Editorial Committee expenses were computed as follows:

	<u>No.</u> <u>Meetings</u>	<u>No.</u> <u>Attending</u>	<u>No. of</u> <u>Man Days</u>	<u>Per</u> <u>Diem</u>	<u>Travel Cost</u> <u>Per Meeting</u>
1982/83	4	6	24	\$250	\$600
1983/84	2	6	12	275	660
1984/85	1	6	6	300	726
1985/86	1	6	6	330	799
1986/87	1	6	6	365	879

In addition, four days of special consultation with Editorial Committee members were included annually, at the same per diem rates.

10. The indirect cost allocation percentage (equal to 24% of salaries) was developed out of historical and projected experience at Princeton University Press (space costs are excluded since it is expected that the Project will be located at the Institute for Advanced Study). Here is a broad breakdown of the composition of the 24%:

Administrative and Accounting Salaries	14.5%
All Other General and Administrative Expenses (excluded stationery and supplies, postage, telephone, which are all treated as direct costs. Also, excludes non-allowable expenses: interest expense and contributions	<u>9.5</u>
	<u>24.0%</u>

Since our Press has never established an indirect cost rate, the National Science Foundation is being requested to make arrangements with the appropriate federal negotiating agency so one can be established. Accordingly, we would like to be audited as soon as possible.

Note: Throughout the budget, a 10% annual inflation factor has been taken into account (except that a 9% inflation factor was used for salaries and fringe benefits).

NYT June 29, 1982

file

Einstein's Papers Near Publication

By WALTER SULLIVAN

AFTER more than a decade of preparation, controversy and costly litigation, the project to publish all of Albert Einstein's papers in 20 volumes is moving ahead, thanks in part to a \$1 million donation from Harold W. McGraw Jr., chairman and chief executive officer of McGraw-Hill Inc., the publishers.

Income from that fund will be used to pay the project's chief editor, but more money is needed for the editorial staff and for seeking out further material. For example, the project is on the track of a 72-page unpublished manuscript, written in 1912, in which Einstein discussed his special theory of relativity.

The project has long been awaited by physicists seeking to understand how one of the great revolutions in human understanding of nature came about. The documents bear, for example, on the evolution of Einstein's thinking from early childhood to the climactic years when he proposed his two theories of relativity.

Material for the first volume, covering Einstein's life from birth until his graduation in 1900 from the Federal Technical Institute in Zurich, has been assembled by John J. Stachel, a science historian who is editor in chief of the project at Princeton University Press.

Biographical and scientific material will be combined and organized chronologically in

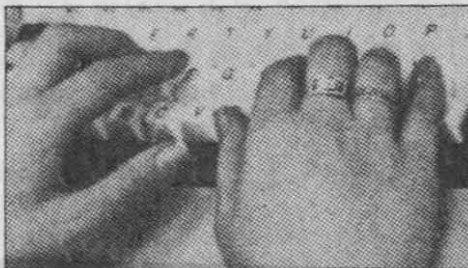
each volume. Dr. Stachel is working from photocopies of the collection. The originals remain at the Institute for Advanced Study in Princeton, where Einstein spent his later years. In his lifetime and after his death in 1955 the documents were gradually assembled there by his secretary, Helen Dukas.

Einstein bequeathed his papers to the Hebrew University of Jerusalem but left them in the trust of Miss Dukas and Dr. Otto Nathan, an associate of Einstein and a literary executor of his estate, during their lifetimes. His will, however, provided that the papers could be transferred to Hebrew University "upon the written direction" of Miss Dukas. She approved that transfer Jan. 1, less than six weeks before her death.

The documents' publication was long delayed by litigation between Dr. Nathan and Princeton University Press. In 1971 a contract was signed between the press and the estate for publication of the papers.

Although Dr. Stachel was provided with an advisory board of distinguished specialists, Dr. Nathan challenged his selection as sole editor. Instead, Dr. Nathan wanted a board of

PERSONAL COMPUTERS



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Continued From Page C1

editors, noting, for example, that five coequal editors had handled the papers of Bertrand Russell.

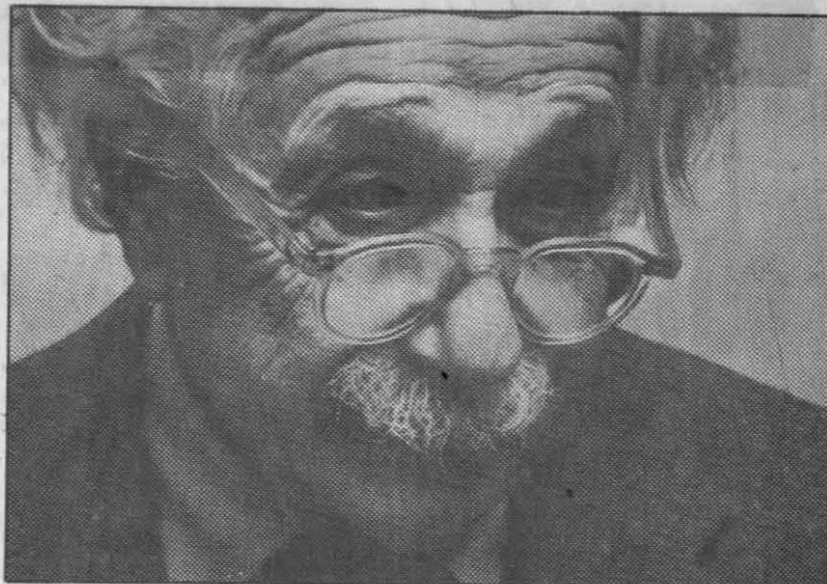
The university press argued that the appointment of Dr. Stachel conformed to the contract. An arbitrator agreed and, despite successive challenges by Dr. Nathan in New York State courts, the choice of a single chief editor was finally upheld last summer.

Herbert Bailey, who heads Princeton University Press, said recently that he hoped the first volume could be sent to the printer by the end of next year. The documentation has been assembled, but extensive notation remains to be added, he said. A number of possible sources must still be explored, such as places where Einstein was educated — the cantonal school in Aarau, Switzerland, and the Federal Institute in Zurich — as well as the patent office in Bern, he said.

A Hard Hand to Read

It was while working in that office that Einstein developed his first, or "special," theory of relativity, the one that uses the speed of light to define the relationship between matter and energy. His subsequent general theory dealt with gravitation.

To decipher some of the manuscripts, Mr. Bailey said in a telephone



Albert Einstein, 1953

The New York Times / Patrick A. Burns

interview, the project has had to find people skilled at reading the German script in which Einstein wrote his notes and manuscripts. Even such experts may puzzle long over a few words, but in the end, he said, they can determine what Einstein meant.

The National Science Foundation

provided some grants during planning stages of the project but halted the support while the project was in litigation. Funds from the Alfred P. Sloan Foundation helped in that period, but now a new application to the science foundation is being prepared and private donations are also being sought.



Handwritten: Xerox: H Woolf

AMERICAN FRIENDS OF THE HEBREW UNIVERSITY, INC.

130 EAST 47TH STREET • NEW YORK, N.Y. 10017 • TEL. (212) 475-8800

June 14, 1982

Mr. Allen Rowe
Associate Director
Institute for Advanced Studies
Princeton University
Princeton, New Jersey 08540

Dear Mr. Rowe:

With the transfer of the Estate of Albert Einstein to the Hebrew University, we, the American Friends on behalf of the University, have also assumed the grave responsibility of the safety of the archives.

In this regard, I wish to emphasize that under no circumstances should anyone be granted access to the archives other than an authorized representative of the Hebrew University, or by written permission from me.

I am sure that this has been the prevailing policy, and I would appreciate your continued cooperation in this respect.

I'd like to extend, on behalf of the American Friends and the Hebrew University, our gratitude for the invaluable services you have provided over the years protecting the Einstein papers. Their value to us go beyond the monetary aspects since Albert Einstein was one of the Hebrew University's founding fathers. We, therefore, are most appreciative to you for insuring the safety of his papers.

Sincerely,

Handwritten signature of Charles E. Bloom

Charles E. Bloom

CEB/kn

Faint vertical text on the left margin, possibly a list of names or a contact list.

Rec'd 24 May 1982

gfw

האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

OFFICE OF THE PRESIDENT
Sherman Building - Mount Scopus
Jerusalem 91905

לשכת הנשיא
בנין שרמן - הר הצופים
ירושלים 91905

6 May 1982

Dr. Harry Woolf
Director
Institute of Advanced Studies
Princeton
N.J. 08540
U.S.A.

Dear Dr. Woolf,

I wish to advise you that Professor Milton Handler has been designated as the representative of the Hebrew University in all matters connected with the Einstein Papers.

Professor Handler's address is:

Messrs. Kaye, Scholer, Fierman, Hays & Handler
425 Park Avenue
New York, N.Y. 10022. Telephone (212) 407-8000.

I would appreciate the help and cooperation you would be kind enough to extend to Professor Handler or any person designated by him.

I am most grateful for all your cooperation.

Sincerely yours,



Avraham Harman
President

AH:hb

HW

Princeton University Press

41 WILLIAM STREET
PRINCETON, NEW JERSEY 08540

(TEL. 609-452-4900)
(TELEX 181160)

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Einstein Project

April 19, 1982

To: Editorial Advisory Board
From: John Stachel



Enclosed please find sample edited documents, together with notes on Editorial Method, which have been prepared for submission with the Grant Proposal to the National Science Foundation. Questions or comments on this material, or the NSF Draft Proposal sent to you in February, will be greatly appreciated. We plan to submit the final version of the Proposal to the NSF in late spring.

Informal response to the Draft Proposal from the NSF has raised the following question:

Do you agree with the decision that documents should appear in their original language in this edition? Would you favor the inclusion of English translations of all documents? I feel strongly that the documents should be in the original language, because any translation represents an interpretive intrusion by the editorial staff. Inclusion of English translations would delay the work and increase the cost immensely. But I would like further comments and advice from the Board.

In annotating the Einstein 1901 paper, the following question arose: Should we append a list of selected references to each paper, listing relevant work by historians and philosophers of science; should such a list be appended to each volume or period covered? Or would the publication of a separate bibliographical volume as a "spin-off" from the Collected Papers be sufficient? We are leaning toward the latter solution. Such a bibliography would be published fairly soon, and up-dated from time to time.

Copies to:

Mr. Herbert S. Bailey, Jr.
Dr. Avraham Harman
Dr. Charles E. Bloom



COLLECTED PAPERS OF ALBERT EINSTEIN

Sample Documents

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EDITORIAL METHOD

The Collected Papers of Albert Einstein will be published in two series of volumes: 1) correspondence and other documents (referred to hereafter as "correspondence"); 2) published papers and manuscripts of unpublished papers (referred to hereafter as "papers"). Each series will be arranged chronologically.

A literal method of transcription is used with the following exceptions: The dateline is always placed above the text. Information added in the dateline is placed in square brackets. The first word in a sentence is always capitalized and a period put at the end of a sentence. Written double consonants "m̄" and "n̄" are given as "mm" and "nn". Obvious and insignificant omissions and errors in the spelling or formulas are silently corrected. Omissions and errors of substance are annotated, as well as unclear or uncommon abbreviations. A conjectural reading for significant omissions, gaps or illegible parts of the text is inserted in square brackets, with a question mark if doubtful, and the nature of the problem annotated. Deletions are ignored unless significant, in which case they are inserted in angle brackets after the corrected text and any peculiarities annotated. Addresses on envelopes or postcards are not reproduced.

In the correspondence volumes, letters and other untitled documents are given a title (e.g., "To WILHELM OSTWALD") placed

immediately above the text. If no precise date can be assigned to a letter or other document, its place in the chronological sequence is determined by the beginning of the nearest unit of time which can be assigned (e.g., month, year, decade). Descriptive symbols used to designate its source directly follow the text. In the examples submitted, only the following occur:

ALS Autograph letter signed
APS Autograph postcard signed

If no indication of the provenance of the document follows the descriptive symbol, the original is in the Einstein Archive, currently at the Institute for Advanced Study in Princeton, New Jersey (ultimately to be moved to the Hebrew University, Jerusalem). Otherwise, the location of the original, if known, follows in parenthesis. Symbols for document repositories are used. American repositories are designated by the symbols used in the National Union Catalogue of the Library of Congress. In the examples submitted, the following symbols occur:

ZAAW: Zentrales Archiv der Akademie der Wissenschaften
der DDR, Berlin
RGN: Rijksmuseum voor de Geschiedenis der Natuurwetenschappen, Leiden

If the current location of the original is not known to us, the source of the copy in the Einstein Archive is indicated. Comments on noteworthy textual features of the document or of the address follow the information on provenance. References to books or articles providing further bibliographical information about the document

follow on a separate line.

In the papers volumes, the original title of a paper is used, if one exists, but reference to Einstein's authorship (e.g., "von Albert Einstein") is deleted. The first published text of previously published books and papers is used as a basis of the published text unless a contrary indication is given in a headnote. The original pagination is indicated in the right-hand margin. Information on the date of completion, submission, acceptance and publication, if available, is provided just below the title. The earliest of these dates that can be assigned to a published paper determines its place in the sequence. If no precise date can be assigned to an unpublished manuscript, its place in the chronological sequence is determined by the beginning of the nearest unit of time which can be assigned (e.g., month, year, decade). Significant variants in manuscripts of the paper (if any exist) or in later printings of the text during Einstein's lifetime are annotated. Manuscripts unpublished during Einstein's lifetime are discussed in headnotes. Information about subsequent republication during Einstein's life follows the document, as well as information about the provenance of any manuscripts or typescripts, if known.

In both series, footnotes in the original text of a document are indicated by superscript symbols, such as * and †, and printed at the foot of the page on which they occur. Editorial footnotes to the text are indicated by superscript numerals and printed after the document.

References to published writing by Einstein in the editorial apparatus are prefixed by "Einstein" (if not obvious from the context) followed by the year of publication and lower-case letter (if more than one item was published in that year) in italics. For example, Einstein 1902b denotes: "Kinetische Theorie des Wärmegleichgewichtes und des zweiten Hauptsatzes der Thermodynamik," Annalen der Physik 9 (1902): 417-433. A list of cited papers appears at the end of each volume. Reference to other items appearing in the Collected Papers is by document title and date (e.g., ETH Abgangs-Zeugnis, August 2, 1900). An appendix to each volume lists a printed source for any previously published documents cited in the volume which have not yet appeared in the Collected Papers.

Short titles will be used after the first full citation within a volume. For example: Körber, "Biographie" stands for Hans-Günther Körber, "Zur Biographie des jungen Albert Einstein," Forschungen und Fortschritte 38 (1964). Some books will be cited throughout in the following abbreviated form: author's last name followed by year of publication of the edition cited and lower-case letter (if more than one book by the author in that year is cited), all in italics. For example, Seelig 1956 stands for Carl Seelig, Helle Zeit-Dunkle Zeit: In Memoriam Albert Einstein (Zürich-Stuttgart-Wien: Europa Verlag, 1956). A list of books so cited appears at the end of each volume.

If a short biography is included in the biographical appendix to a volume (or reference given there to one in an earlier volume) this is indicated by printing the person's last name in small capitals wherever it appears in the editorial apparatus. (This does not apply to names which appear in a document title). No biographies are given of individuals having entries in the Dictionary of Scientific Biography (New York: Charles Scribner, 1981).

With reference to the attached documents note that:

1) A relevant letter of Hermann Einstein to Wilhelm Ostwald, April 13, 1901, is not included because we are not in possession of a photocopy of the original. The text of the letter is printed in Körber, "Biographie".

2) Although the text of Einstein 1901 is reproduced here from the Annalen der Physik, with minor corrections made and footnotes added, the entire paper will be reset in the printed version of the Collected Papers.

3) Commenting on Einstein to Kamerlingh Onnes, April 12, 1901, Clark states "....the reply-page second half of the card, self-addressed to 'A. Einstein, via Bigli 21, Milano,' remains blank in the museum's archives" [Ronald W. Clark, Einstein: The Life and Times (New York and Cleveland: The World Publishing Co., 1971) p.43]. No copy of this "reply-page second half" is in the photocopy in the Einstein Archive. Clark's information will be checked on the original in the National Museum for the History of Science, Leiden and, if correct, added to the published version of the letter.

LETTERS

To WILHELM OSTWALD¹

Zürich den 19. März 1901.

Sehr geehrter Herr Professor!

Da ich durch Ihr Werk über allgemeine Chemie zu der beiliegenden Abhandlung angeregt worden bin, bin ich so frei, Ihnen ein Exemplar davon zu schicken.² Bei dieser Gelegenheit erlaube ich mir auch, Sie zu fragen, ob Sie vielleicht für einen mathematischen Physiker, der mit absoluten Messungen vertraut ist, Verwendung hätten.³ Ich nehme mir nur darum die Freiheit zu einer solchen Anfrage, weil ich unbemittelt bin, und mir nur eine derartige Stelle die Möglichkeit weiterer Ausbildung bieten könnte.

Mit vorzüglicher Hochachtung zeichne ich

Albert Einstein

Via Bigli 21.

Milano

Italia.

ALS (ZAAW: Wilhelm-Ostwald-Archiv)
Hans-Günther Körber, "Zur Biographie des jungen Albert Einstein,"
Forschungen und Fortschritte 38 (1964):74-78.

1. Wilhelm Ostwald (1853-1932), one of the foremost physical chemists at the turn of the century, was a professor at the University of Leipzig.

2. Ostwald's Lehrbuch der allgemeinen Chemie, 2nd rev. ed., 2 vols. (Leipzig: Verlag von Wilhelm Engelmann, 1891-1906) served as the major reference work for Einstein 1901, a reprint of which is still in the Ostwald collection, ZAAW (see Körber, "Biographie"). If Ostwald read it, it is unlikely he was favorably impressed by Einstein's use of the atomic-molecular hypothesis to discuss capillary phenomena. As an anti-atomist, Ostwald attacked such explanations of capillarity in the introduction to vol. 2 of his Lehrbuch. He gave up his anti-atomism about 1909, partly in response to Einstein's work on Brownian motion.

3. Einstein took WEBER's course on "System der absoluten elektrischen Messungen" at the ETH (ETH Abgangs-Zeugnis, August 2, 1900).

To WILHELM OSTWALD

Mailand den 3. April 1901

Hoch geehrter Herr Professor!

Vor einigen Wochen erlaubte ich mir, Ihnen von Zürich aus eine kleine Abhandlung zu übersenden, die ich in Wiedemanns Annalen veröffentlichte.¹

Da mir an Ihrem Urteil darüber sehr viel gelegen ist, und ich nicht sicher bin, ob ich damals meine Adresse beigefügt habe, erlaube ich mir, dieselbe Ihnen nachträglich zu übermitteln.

Mit vorzüglicher Hochachtung

ergebenst

Albert Einstein

cand. phys.²

Milano

Via Bigli 21.

APS (ZAAW: Wilhelm-Ostwald-Archiv)

Hans-Günther Körber, "Zur Biographie des jungen Albert Einstein,"
Forschungen und Fortschritte 38 (1964):74-78.

1. See Einstein to Ostwald, March 14, 1901. Einstein should have referred to Drude's Annalen. Upon Gustav Wiedemann's death in 1899, Paul Drude assumed editorship of the Annalen der Physik.

2. candidatus physicae. At this time, Einstein was planning to submit his work on molecular forces to the University of Zürich for a doctorate in physics (Einstein to Grossmann, April 14, 1901, note 9).

To HEIKE KAMERLINGH ONNES¹

Mailand d. 12. April 1901

Sehr geehrter Herr Professor!

Durch einen Studienfreund² erfahre ich, daß bei Ihnen eine Assistentenstelle frei ist. Ich erlaube mir, mich um dieselbe zu bewerben. Ich studierte 4 Jahre an der Abteilung für Mathematik und Physik des Polytechnikums in Zürich, wobei ich mich für Physik spezialisierte. Dort erwarb ich mir letzten Sommer das Diplom. Meine Zeugnisse stehen Ihnen natürlich gerne zu Diensten.³

Auch beehre ich mich, Ihnen mit gleicher Post einen Abdruck meiner jüngst in den Annalen der Physik erschienenen Abhandlung⁴ zu unterbreiten.

Mit vorzüglicher Hochachtung

Albert Einstein

APS (RGN)

B.A. van Proosdij, "Some Letters from Albert Einstein to Heike Kamerlingh Onnes," Janus 48 (1959):41-43.

1. Kamerlingh Onnes (1853-1926) held the chair of experimental physics at the University of Leiden.

2. This friend has not been identified. Einstein to Grossmann, April 14, 1901, suggests that it may have been GROSSMANN or EHRAT.

3. ETH Abgangs-Zeugnis, August 2, 1900.

4. Einstein 1901.

To MARCEL GROSSMANN¹

Mailand den 14. April. [1901]

Lieber Marcel!

Als ich gestern Deinen Brief fand, war ich wirklich gerührt über Deine Treue und Menschenfreundlichkeit, die Dich an Deinen alten Freund und Pechvogel noch nicht hat vergessen lassen. Ich glaube wirklich, daß nicht so leicht einer bessere Kollegen gehabt hat wie ich in Dir und Ehrat.² Ich brauche Dir wohl kaum zu sagen, daß ich glücklich wäre, wenn ich einen so schönen Wirkungskreis erhalten könnte, und daß ich alles aufbieten würde, um Eurer Empfehlung keine Unehre zu machen.³ Seit drei Wochen bin ich hier bei meinen Eltern, um von hier aus eine Stelle als Assistent in einer Universität zu suchen.⁴ Ich hätte auch längst eine solche gefunden, wenn Weber⁵ nicht ein falsches Spiel gegen mich spielte. Trotzdem lasse ich kein Mittel unversucht und laß mir auch den Humor nicht verderben ... Gott schuf den Esel und gab ihm ein dickes Fell.

Wir haben hier den herrlichsten Frühling, und die ganze Welt hierlacht einen so glücklich an, daß man ganz von selbst den alten Hypochonder⁶ abstreift. Zudem schützen mich hier musikalische Bekannte vor dem Versauern.⁷

In wissenschaftlicher Beziehung sind mir ein paar herrliche

Ideen in den Kopf gekommen, die nur noch gehörig ausgebrütet werden müssen. Ich glaube nun sicher, daß meine Theorie der Attraktionskräfte der Atome⁸ auch auf Gase ausgedehnt werden kann, und daß die charakteristischen Konstanten für fast alle Elemente ohne erhebliche Schwierigkeit zu ermitteln sein werden. Dann wird auch die Frage nach der innern Verwandtschaft der Molekularkräfte mit den Newtonschen Fernkräften ihrer Entscheidung um einen großen Schritt näher rücken. Vielleicht werden die schon von andern zu andern Zwecken angestellten Untersuchungen zur Prüfung der Theorie hinreichen. In diesem Fall werde ich dann alles bis jetzt Erreichte über molekulare Anziehung zur Doktordissertation verwenden.⁹ Es ist ein herrliches Gefühl, die Einheitlichkeit eines Komplexes von Erscheinungen zu erkennen, die der direkten sinnlichen Wahrnehmung als ganz getrennte Dinge erscheinen.

Ich bitte Dich, Deine werten Angehörigen freundlichst von mir zu grüßen, und Deinem Papa herzlichst für seine Bemühung zu danken, sowie für das Vertrauen, das er mir dadurch entgegenbrachte, daß er mich empfohlen hat.¹⁰ Dir einen freundschaftlichen Gruß

von Deinem

Albert Einstein

Via Bigli 21

Milano.

ALS: Copy provided by Miss Elsbeth Grossmann

1. GROSSMANN (1878-1936), after graduating from the ETH in 1900, spent the following year there as assistant to the mathematics professor Wilhelm Fiedler.

2. Jakob EHRAT (1876-1960). After graduating from the ETH in 1900, he spent the following three years there as assistant to mathematics professor Ferdinand Rudio.
3. Jules Grossmann, Marcel's father, recommended Einstein to Friedrich HALLER (1844-1936), Director of the Swiss Patent Office, with whom he was on friendly terms.
4. See Einstein to Ostwald, March 19 and April 3, 1901 and Einstein to Kamerlingh Onnes, April 12, 1901.
5. Heinrich Friedrich WEBER (1843-1912). After leading Einstein to believe he would receive an assistantship upon graduation, Weber chose two engineers as his assistants in 1900 (Kayser 1930, pp.59-60 and Seelig 1952, p.49).
6. Einstein's chronic stomach troubles may already have begun. Kayser 1930, pp.53-54, attributes their origin to undernourishment while Einstein was a student at the ETH.
7. Probably the Ansbacher family (see Einstein to Alfred STERN, May 3, 1901).
8. See Einstein 1901.
9. Nothing came of this plan. In November 1901 Einstein submitted his third paper (Einstein 1902b) to the University of Zürich in an unsuccessful attempt to get a doctorate (see Einstein to Swiss Patent Office, December 18, 1901). In early 1903 he temporarily abandoned attempts to get a doctorate (see Einstein to BESSO, [January 1903]). He finally obtained it from Zürich for Einstein 1905a.
10. See note 2.

PAPER

Einstein 1901 and 1902a were part of an investigation of the "attractive forces between atoms" (Einstein to Grossmann, April 14, 1901) in the mechanistic tradition of explaining physical phenomena by means of central forces between particles. 1901 uses thermodynamic methods to evaluate postulated molecular characteristic constants from experimental data.¹ The first indication of Einstein's interest in the problem of molecular forces is his comment "Investigate! Vacation" in Weber Notebook II [1896-1900], where WEBER refers to the unknown form of the intermolecular force law in fluids. The explanation of capillary phenomena by means of short-range molecular forces had been actively pursued since Laplace and a lecture on capillarity by Minkowski (ETH, summer 1900) drew Einstein's praise.² Einstein to Ostwald, March 19, 1901 states that 1901 was stimulated by the latter's Lehrbuch der allgemeinen Chemie, vol.1 of which is the only reference cited.³ Einstein to Grossmann, April 14, 1901 indicates he hoped to use 1901 as the basis of a doctoral dissertation but after 1902a he abandoned the subject of molecular forces (except for 1911a), referring (Einstein to Stark, December 7, 1907) to his "two worthless beginner's works." Attempts to use 1901 in a renewed search for an academic position (Einstein to Ostwald, March 19 & April 3, 1901; to Kamerlingh Onnes, April 12, 1901; H. Einstein to Ostwald, April 13, 1901) were no more successful.

1. It was not uncommon to combine the thermodynamic and molecular approaches to capillarity. For contemporary surveys mentioning Einstein 1901, see F. Pockel's "Kapillarität" in Winkelmann 1908, pp. 1119-1234; Herbert Freundlich, Kapillarchemie (Leipzig: Akademische Verlagsgesellschaft, 1909).

2. Louis KOLLROS, "Erinnerungen eines Kommilitonen" (Seelig 1956, pp. 17-31) reports Einstein's comment after the lecture: "That is the first lecture on mathematical physics that we have heard at the Poly!"

3. Wilhelm Ostwald, Lehrbuch der allgemeinen Chemie, 2nd rev. ed., vol.1 (Leipzig: Verlag von Wilhelm Engelmann, 1891). Ostwald became an energeticist about this time. The Introduction to vol.2, part 1 of the Lehrbuch (1893) contains an attack on molecular theories and advocates a purely thermodynamic treatment of capillarity (pp.27-29).

FOLGERUNGEN AUS DEN CAPILLARITÄTSPHÄNOMENEN

Zürich, den 13. December 1900.

(Eingegangen 16. December 1900.)

[Published in Annalen der Physik, vol.4, no.3, March 1, 1901]

Bezeichnen wir mit γ diejenige Menge mechanischer Arbeit, welche wir der Flüssigkeit zuführen müssen, um die freie Oberfläche um die Einheit zu vergrössern, so ist γ nicht etwa die gesamte Energiezunahme des Systems, wie folgender Kreisprocess lehrt. Sei eine bestimmte Flüssigkeitsmenge vorliegend von der (absoluten) Temperatur T_1 und der Oberfläche O_1 . Wir vermehren nun isothermisch die Oberfläche O_1 auf O_2 , erhöhen die Temperatur auf T_2 (bei constanter Oberfläche), vermindern dann die Oberfläche auf O_1 und kühlen dann die Flüssigkeit wieder auf T_1 ab. Nimmt man nun an, dass dem Körper ausser der ihm vermöge seiner specifischen Wärme zukommenden keine andere Wärmemenge zugeführt wird, so ist bei dem Kreisprocess die Summe der dem Körper zugeführten Wärme gleich der Summe der ihm entnommenen. Es muss also nach dem Princip von der Erhaltung der Energie auch die Summe der zugeführten mechanischen Arbeiten gleich Null sein.

Es gilt also die Gleichung:

$$(O_2 - O_1)\gamma_1 - (O_2 - O_1)\gamma_2 = 0 \quad \text{oder} \quad \gamma_1 = \gamma_2.$$

Dies widerspricht aber der Erfahrung.¹

Es bleibt also nichts anderes übrig als anzunehmen, dass mit der Aenderung der Oberfläche auch ein Austausch der Wärme verbunden sei, und dass der Oberfläche eine eigene specifische Wärme zukomme. Bezeichnen wir also mit U die Energie, mit S die Entropie der Flächeneinheit der Flüssigkeit, mit s die specifische Wärme der Oberfläche, mit w_0 die zur Bildung der Flächeneinheit erforderliche Wärme in mechanischem Maass, so sind die Grössen:

$$dU = s \cdot O \cdot dT + \{\gamma + w_0\} dO$$

und

$$dS = \frac{s \cdot O \cdot dT}{T} + \frac{w_0}{T} dO$$

vollständige Differentiale. Es gelten also die Gleichungen:

$$\frac{\partial (s \cdot O)}{\partial O} = \frac{\partial (\gamma + w_0)}{\partial T}, \quad 514$$
$$\frac{\partial}{\partial O} \left(\frac{s \cdot O}{T} \right) = \frac{\partial}{\partial T} \left(\frac{w_0}{T} \right).$$

Aus diesen Gleichungen folgt:

$$\gamma + w_0 = \gamma - T \frac{\partial \gamma}{\partial T}.$$

Dies aber ist die gesamte Energie, welche zur Bildung der Einheit der Oberfläche nötig ist.

Bilden wir noch:²

$$\frac{d}{dT} (\gamma + w_0) = -T \frac{d^2 \gamma}{dT^2}.$$

Die Experimentaluntersuchungen haben nun ergeben, dass sich stets sehr nahe γ als lineare Function der Temperatur darstellen lässt,³ d. h.:

Die zur Bildung der Flächeneinheit einer Flüssigkeit nötige Energie ist unabhängig von der Temperatur.

Ebenso folgt:

$$s = \frac{d\gamma}{dT} + \frac{dw_0}{dT} = \frac{d\gamma}{dT} - \frac{d\gamma}{dT} - T \frac{d^2 \gamma}{dT^2} = 0,$$

also: Der Oberfläche als solcher ist kein Wärmeinhalt zuzuschreiben, sondern die Energie der Oberfläche ist potentieller Natur.⁴ Man sieht schon jetzt, dass

$$\gamma - T \frac{d\gamma}{dT}$$

eine zu stöchiometrischen Untersuchungen sich geeigneter Grösse ist, als das bisher benutzte γ bei Siedetemperatur. Die Thatsache, dass die zur Bildung der Flächeneinheit erforderliche Energie kaum mit der Temperatur variirt, lehrt uns aber auch, dass die Configuration der Moleüle in der Oberflächenschicht mit der Temperatur nicht variiren wird (abgesehen von Aenderungen von der Grössenordnung der thermischen Ausdehnung).

Um nun für die Grösse

$$\gamma - T \frac{d\gamma}{dT}$$

eine stöchiometrische Beziehung aufzufinden, ging ich von den einfachsten Annahmen über die Natur der molecularen An-

ziehungskräfte aus, und prüfte deren Consequenzen auf ihre Uebereinstimmung mit dem Experiment hin. Ich liess mich dabei von der Analogie der Gravitationskräfte leiten.

Sei also das relative Potential zweier Molecüle von der Form:

$$P = P_{\infty} - c_1 \cdot c_2 \cdot \varphi(r),$$

wobei c eine für das betreffende Molecül charakteristische Constante ist, $\varphi(r)$ aber eine vom Wesen der Molecüle unabhängige Function ihrer Entfernung.⁵ Wir nehmen ferner an, dass

$$\frac{1}{2} \sum_{\alpha=1}^n \sum_{\beta=1}^n c_{\alpha} c_{\beta} \varphi(r_{\alpha, \beta})$$

der entsprechende Ausdruck für n Molecüle sei. Sind speciell alle Molecüle gleich beschaffen, so geht dieser Ausdruck in

$$\frac{1}{2} c^2 \sum_{\alpha=1}^n \sum_{\beta=1}^n \varphi(r_{\alpha, \beta})$$

über. Wir machen ferner noch die Annahme, dass das Potential der Molecularkräfte ebenso gross sei, wie wenn die Materie homogen im Raume verteilt wäre; es ist dies allerdings eine Annahme, von der wir nur angenähert die Richtigkeit erwarten dürfen. Mit ihrer Hülfe verwandelt sich der obige Ausdruck in:

$$P = P_{\infty} - \frac{1}{2} c^2 N^2 \iint d\tau \cdot d\tau' \varphi(r_{d\tau, d\tau'}),$$

wobei N die Anzahl der Molecüle in der Volumeneinheit ist. Ist das Molecül unserer Flüssigkeit aus mehreren Atomen zusammengesetzt, so soll analog wie bei den Gravitationskräften $c = \sum c_{\alpha}$ gesetzt werden können, wobei die c_{α} den Atomen der Elemente charakteristische Zahlen bedeuten. Setzt man noch $1/N = v$, wobei v das Molecularvolum bedeutet, so erhält man die endgültige Formel:

$$P = P_{\infty} - \frac{1}{2} \frac{(\sum c_{\alpha})^2}{v^2} \iint d\tau \cdot d\tau' \varphi(r_{d\tau, d\tau'}).$$

Setzen wir nun noch voraus, dass die Dichte der Flüssigkeit bis zu deren Oberfläche constant ist, was ja durch die Thatsache wahrscheinlich gemacht wird, dass die Energie der Oberfläche von der Temperatur unabhängig ist, so sind wir nun im stande die potentielle Energie der Volumeneinheit im

Inneren der Flüssigkeit und die der Oberflächeneinheit zu berechnen. ⁶ 516

Setzen wir nämlich

$$\frac{1}{2} \int_{z=-\infty}^{+\infty} \int_{y=-\infty}^{+\infty} \int_{x=-\infty}^{+\infty} dx dy dz \cdot \varphi(\sqrt{x^2 + y^2 + z^2}) = K,$$

so ist die potentielle Energie der Volumeneinheit

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v^2}.$$

Denken wir uns eine Flüssigkeit vom Volumen V und von der Oberfläche S , so erhalten wir durch Integration ⁷

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v^2} \cdot V + K' \frac{(\sum c_a)^2}{v^2} \cdot S,$$

wobei die Constante K' bedeutet: ⁸

$$\int_{x'=0}^{x'=1} \int_{y'=0}^{y'=1} \int_{z'=0}^{z'=0} \int_{x=-\infty}^{x=\infty} \int_{y=-\infty}^{y=\infty} \int_{z=0}^{z=\infty} dx \cdot dy \cdot dz \cdot dx' \cdot dy' \cdot dz' \cdot \varphi(\sqrt{(x-x')^2 + (y-y')^2 + (z-z')^2}).$$

Da über φ nichts bekannt ist, bekommen wir natürlich keine Beziehung zwischen K und K' .

Dabei ist zunächst im Auge zu behalten, dass wir nicht wissen können, ob das Flüssigkeitsmolecul nicht die n -fache Masse des Gasmolecöles besitzt, doch folgt aus unserer Herleitung, dass dadurch unser Ausdruck der potentiellen Energie der Flüssigkeit nicht geändert wird. Für die potentielle Energie der Oberfläche bekommen wir, auf Grund der eben gemachten Annahme, den Ausdruck: ⁹

$$P = K' \frac{(\sum c_a)^2}{v^2} = \gamma - T \frac{d\gamma}{dT},$$

oder

$$\sum c_a = v \cdot \sqrt{\gamma - T \frac{d\gamma}{dT}} \cdot \frac{1}{\sqrt{K'}}.$$

Da die rechts stehende Grösse für Siedetemperatur für viele Stoffe aus den Beobachtungen von R. Schiff berechenbar ist, so bekommen wir reichlichen Stoff zur Bestimmung der Grössen c_a . Ich entnahm das gesamte Material dem Buch

über Allgemeine Chemie von W. Ostwald.¹⁰ Ich gebe hier zunächst das Material an, mittels dessen ich das c_a für C, H, O nach der Methode der kleinsten Quadrate berechnete. In der mit $\sum c_{a\text{ber.}}$ überschriebenen Columne sind die $\sum c_a$ angegeben, wie sie mit Hilfe der so gewonnenen c_a aus den chemischen Formeln sich ergeben. Isomere Verbindungen wurden zu einem Wert vereinigt, weil die ihnen zugehörigen Werte der linken Seite nur unbedeutend voneinander abwichen. Die Einheit wurde willkürlich gewählt, weil, da K' unbekannt ist, eine absolute Bestimmung der c_a nicht möglich ist.

Ich fand:

$$c_H = -1,6, \quad c_C = 55,0, \quad c_O = 46,8.$$

Formel	$\sum c_a$	$\sum c_{a\text{ber.}}$	Name der Verbindung
$C_{10}H_{16}$	510	524	Citronenterpen
CO_2H_2	140	145	Ameisensäure
$C_2H_4O_2$	198	197	Essigsäure
$C_3H_6O_2$	250	249	Propionsäure
$C_4H_8O_2$	309	301	Buttersäure und Isobuttersäure
$C_5H_{10}O_2$	365	352	Valeriansäure
$C_6H_{12}O_2$	350	350	Acetanhydrid
$C_6H_{10}O_4$	505	501	Aethyloxalat
$C_6H_8O_2$	494	520	Methylbenzoat
$C_6H_{10}O_2$	553	562	Aethylbenzoat
$C_6H_{10}O_3$	471	454	Acetessigäther
C_7H_8O	422	419	Anisol
$C_6H_{10}O$	479	470	Phenetol und Methylcresolat
$C_6H_{10}O_2$	519	517	Dimethylresorcin
$C_5H_4O_2$	345	362	Furfurol
C_5H_8O	348	305	Valeraldehyd
$C_{10}H_{14}O$	587	574	Carvol

Man sieht, dass die Abweichungen in fast allen Fällen die Versuchsfehler wohl kaum übersteigen und keinerlei Gesetzmässigkeit zeigen.

Hierauf berechnete ich gesondert die Werte für Cl, Br und J, welchen Bestimmungen natürlich eine geringere Sicherheit zukommt, und fand:

$$c_{Cl} = 60, \quad c_{Br} = 152, \quad c_J = 198.$$

Ich lasse nun in gleicher Weise wie oben das Material folgen:

Formel	$\sum c_a$	$\sum c_{a\text{ber.}}$	Name der Verbindung
C_6H_5Cl	385	379	Chlorbenzol
C_7H_7Cl	438	484	Chlortoluol
C_7H_7Cl	450	434	Benzylchlorid
C_3H_5OCl	270	270	Epichlorhydrin
C_2OHCl_2	358	335	Chloral
C_7H_5OCl	462	484	Benzoylchlorid
$C_7H_6Cl_2$	492	495	Benzylidenchlorid
Br_2	217	304	Brom
C_2H_5Br	251	254	Aethylbromid
C_3H_7Br	311	306	Propylbromid
C_3H_7Br	311	306	Isopropylbromid
C_3H_5Br	302	309	Allylbromid
C_4H_9Br	353	354	Isobutylbromid
$C_5H_{11}Br$	425	410	Isoamylbromid
C_6H_5Br	411	474	Brombenzol
C_7H_7Br	421	526	o-Bromtoluol
$C_2H_4Br_2$	345	409	Aethylenbromid
$C_3H_6Br_2$	395	461	Propylenbromid
C_2H_5J	288	300	Aethyljodid
C_3H_7J	343	352	Propyljodid
C_3H_7J	357	352	Isopropyljodid
C_3H_5J	338	355	Allyljodid
C_4H_9J	428	403	Isobutyljodid
$C_5H_{11}J$	464	455	Isoamyljodid

Es scheint mir, dass grössere Abweichungen von unserer Theorie bei solchen Stoffen eintreten, welche verhältnismässig grosse Molecularmaasse und kleines Molecularvolum haben.

Wir haben aus unseren Annahmen gefunden, dass die potentielle Energie der Volumeneinheit den Ausdruck besitzt:

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v^2},$$

dabei bedeutet K eine bestimmte Grösse, welche wir aber nicht berechnen können, da es überhaupt erst durch die Wahl der c_a vollkommen defnirt wird. Wir können daher $K = 1$ setzen und gewinnen so eine Definition für die absoluten Werte der c_a . Berücksichtigen wir dies von nun an, so erhalten wir für die Grösse des Potentials, welche dem Aequivalent (Molekül) zukommt, den Ausdruck:¹¹

$$P = P_{\infty} - K \frac{(\sum c_a)^2}{v},$$

wobei natürlich P_{∞} eine andere Constante bedeutet. Nun könnten wir aber das zweite Glied der rechten Seite dieser Gleichung der Differenz $D_m J - A v_d$ gleich setzen — wobei D_m die moleculare Verdampfungswärme (Dampfwärme \times Molecularmasse), J das mechanische Aequivalent der Calorie, A den Atmosphärendruck in absolutem Maass und v_d das Molecularvolum des Dampfes ist —, wenn die potentielle Energie des Dampfes Null wäre und wenn für Siedetemperatur der Inhalt an kinetischer Energie beim Uebergang vom flüssigen in den Gaszustand ungeändert bliebe.¹² Die erste dieser Annahmen scheint mir unbedenklich. Da wir aber zu der letzteren Annahme keinen Grund haben, aber auch keine Möglichkeit die fragliche Grösse abzuschätzen, so bleibt uns nichts anderes übrig, als die obige Grösse selbst zur Rechnung zu benutzen.

In die erste Spalte der folgenden Tabelle habe ich die Grössen $\sqrt{D'_m \cdot v}$ im Wärmemaass eingetragen, wobei D'_m die um die äussere Verdampfungsarbeit (in Wärmemaass) verminderte Verdampfungswärme bedeutet. In die zweite setzte ich die Grössen $\sum c_{\text{per}}$, wie sie aus den Capillaritätsversuchen ermittelt sind; in der dritten finden sich die Quotienten beider Werte. Isomere Verbindungen sind wieder zu einer Zeile vereinigt.¹³

Name der Verbindung	Formel	$\sqrt{D'_m \cdot v}$	$\sum c_{\text{per}}$	Quotient
Isobutylpropionat	$C_7H_{14}O_2$	1157	456	2,54
Isoamilacetat	"			
Propylacetat	"			
Isobutylisobutytrat	$C_8H_{16}O_2$	1257	510	2,47
Propylvalerat	"			
Isobutylbutytrat	"			
Isoamylpropionat	"			
Isoamylisobutytrat	$C_9H_{18}O_2$	1367	559	2,45
Isobutylvalerat	"			
Isoamylvalerat	$C_{10}H_{20}O_2$	1464	611	2,51
Benzol	C_6H_6	795	310	2,57
Toluol	C_7H_8	902	372	2,48
Aethylbenzol	C_8H_{10}	1005	424	2,37
m-Xylol	"			
Propylbenzol	C_9H_{12}	1122	475	2,36
Mesitylen	"			
Cymol	$C_{10}H_{14}$	1218	527	2,30
Aethylformiat	$C_3H_6O_2$	719	249	2,89
Methylacetat	"			

Name der Verbindung	Formel	$\sqrt{D_m} \cdot v$	$\sum c_{a_{ber}}$	Quotient	520
Aethylacetat	$C_4H_8O_2$	837	301	2,78	
Methylpropionat	"				
Propylformiat	"				
Methylisobutyrat	$C_5H_{10}O_2$	882	353	2,50	
Isobutylformiat	"				
Aethylpropionat	"				
Propylacetat	"				
Methylbutyrat	"				
Aethylisobutyrat	$C_6H_{12}O_2$	971	405	2,40	
Methylvalerat	"				
Isobutylacetat	"				
Aethylbutyrat	"				
Propylpropionat	"				
Isoamylformiat	"				

Trotzdem der in der fünften Columne eingetragene Quotient keineswegs eine Constante ist, sondern vielmehr deutlich von der Constitution der Stoffe abhängt, so können wir das vorliegende Material doch dazu benutzen, diejenige Zahl, wenigstens der Grössenordnung nach, zu ermitteln, mit der unsere c_a multiplicirt werden müssen, damit wir sie in der von uns gewählten absoluten Einheit erhalten. Der gesuchte Multipliator ergibt sich im Mittel:

$$2,51 \cdot \sqrt{4,17 \cdot 10^7} = 1,62 \cdot 10^4.$$

Da die vorhergehende Betrachtung zeigt, dass sich bei der Verdampfung die kinetischen Verhältnisse der Molecüle verändern (wenigstens wenn unser Ausdruck für die potentielle Energie richtig ist), unternahm ich es die absolute Grösse c_a noch auf eine andere Weise aufzusuchen. Dabei ging ich von der folgenden Idee aus:

Comprimirt man eine Flüssigkeit isothermisch und ändert sich dabei ihr Wärmehalt nicht, was wir nun voraussetzen wollen, so ist die bei der Compression entweichende Wärme gleich der Summe der Compressionsarbeit und der von den Molecularkräften geleisteten Arbeit. Wir können also letztere Arbeit berechnen, wenn wir die bei der Compression entweichende Wärmemenge eruiren können. Dazu aber verhilft uns das Carnot'sche Princip.

Sei nämlich der Zustand der Flüssigkeit durch den Druck p in absoluten Einheiten und die absolute Temperatur T bestimmt; ist nun bei einer unendlich kleinen Zustandsänderung dQ die dem Körper zugeführte Wärme in absolutem Maass, dA die ihm zugeführte mechanische Arbeit, und setzen wir

$$\begin{aligned}dQ &= X dp + S. dT, \\dA &= -p. dv = -p \left\{ \frac{\partial v}{\partial p} dp + \frac{\partial v}{\partial T} dT \right\} \\&= p. v. \kappa dp - p. v. \alpha dT,\end{aligned}$$

so liefert uns die Bedingung, dass dQ/T und $dQ + dA$ vollständige Differentiale sein müssen, die Gleichungen

$$\frac{\partial}{\partial T} \left(\frac{X}{T} \right) = \frac{\partial}{\partial p} \left(\frac{S}{T} \right)$$

und

$$\frac{\partial}{\partial T} (X + p\kappa) = \frac{\partial}{\partial p} (S - p\alpha)$$

hierbei bedeuten, wie man sieht, X die bei isothermischer Compression durch den Druck $p = 1$ dem Körper zugeführte Wärme in mechanischem Maass, S die spezifische Wärme bei constantem Druck, κ den Compressibilitätscoefficienten, α den thermischen Ausdehnungscoefficienten. Aus diesen Gleichungen findet man:

$$X dp = -T \left\{ \alpha + p \frac{\partial \alpha}{\partial p} + p \frac{\partial \kappa}{\partial T} \right\} dp.$$

Nun ist daran zu erinnern, dass der Atmosphärendruck, unter dem sich unsere Körper gewöhnlich finden, für Compressionserscheinungen von Flüssigkeiten unbedenklich als unendlich klein zu betrachten ist; ebenso sind die Compressionen in unseren Experimenten sehr nahe proportional den angewandten Compressionskräften. Die Erscheinungen gehen also so vor sich, wie wenn die Compressionskräfte unendlich klein wären. Berücksichtigt man dies, so geht unsere Gleichung über in:

$$X. dp = -T. \alpha. dp.$$

Wenden wir nun die Voraussetzung an, dass bei isothermischer Compression die kinetische Energie des Systems nicht geändert wird, so erhalten wir die Gleichung

$$X. dp + \text{Compressionsarbeit} + \text{Arbeit der Molecularkräfte} = 0.$$

Ist P das Potential der Molecularkräfte, so ist die letzte Arbeit:

$$\frac{\partial P}{\partial v} \cdot \frac{\partial v}{\partial p} \cdot dp.$$

Setzt man unseren Ausdruck für die Grösse des Potentials der Molecularkräfte hierin ein und berücksichtigt, dass die Compressionsarbeit von der Ordnung dp^3 ist, so erhält man bei Vernachlässigung dieser unendlich kleinen Grösse zweiter Ordnung

$$\frac{T_a}{\kappa} = \frac{(\sum c_a)^2}{v^2},$$

wobei κ den Compressibilitätscoefficienten in absolutem Maasse bezeichnet. Wir erhalten so abermals ein Mittel, den gesuchten Proportionalitätscoefficienten für die Grössen c_a zu bestimmen. Die Grössen α und κ für die Temperatur des Eises entnahm ich den Tabellen von Landolt und Börnstein.¹⁴ Man erhält so für den gesuchten Factor die Werte:

Xylol	1,71 . 10 ⁴	Aethylalkohol	1,70 . 10 ⁴
Cymol	1,71 . 10 ⁴	Methylalkohol	1,74 . 10 ⁴
Terpentinöl	1,73 . 10 ⁴	Propylalkohol	1,82 . 10 ⁴
Aethyläther	1,70 . 10 ⁴	Amylalkohol	2,00 . 10 ⁴

Zunächst ist zu bemerken, dass die beiden durch verschiedene Methoden erlangten Coefficienten recht befriedigend übereinstimmen, trotzdem sie aus ganz verschiedenen Phänomenen hergeleitet sind.¹⁵ Die letzte Tabelle zeigt sehr befriedigende Uebereinstimmung der Werte, nur die kohlenstoffreicheren Alkohole weichen ab. Es ist dies auch zu erwarten, denn aus den Abweichungen, welche die Alkohole von dem thermischen Ausdehnungsgesetz von Mendelejew und von dem stöchiometrischen Capillaritätsgesetz von R. Schiff zeigen, hat man schon früher geschlossen, dass bei diesen Verbindungen mit Temperaturänderungen Aenderungen der Grösse der Flüssigkeitsmolecüle verbunden sind.¹⁶ Es ist also auch zu erwarten, dass bei isothermischer Compression solche moleculare Veränderungen auftreten, sodass für solche Stoffe bei gleicher Temperatur der Wärmeinhalt Function des Volums sein wird.

Zusammenfassend können wir also sagen, dass sich unsere fundamentale Annahme bewährt hat: Jedem Atom entspricht

ein moleculares Anziehungsfeld, welches unabhängig von der Temperatur und unabhängig von der Art ist, wie das Atom mit anderen Atomen chemisch verbunden ist.

Schliesslich ist noch darauf hinzuweisen, dass mit steigendem Atomgewicht im allgemeinen auch die Constanten c_a steigen, doch nichts stets und nicht in proportionaler Art. Die Frage, ob und wie unsere Kräfte mit den Gravitationskräften verwandt sind, muss also noch vollkommen offen gelassen werden.¹⁷ Es ist auch hinzuzufügen, dass die Einführung der Function $\varphi(r)$, welche unabhängig von der Natur der Molecüle sein sollte, nur als Näherungsannahme aufzufassen ist, ebenso die Ersetzung der Summen durch Integrale; in der That scheint sich unsere Theorie für Stoffe von kleinem Atomvolum nicht zu bewähren, wie das Beispiel des Wassers darthut. Ueber diese Fragen sind erst von eingehenden Specialforschungen Aufschlüsse zu hoffen.

1. Surface tension is a (decreasing) function of temperature. Essentially the same argument was first given by Kelvin: William Thomson, Proceedings of the Royal Society 9 (1858):255-256.
2. The following equation has been called Einstein's equation: R. Defay and I. Prigogine, Surface Tension and Adsorption (New York: John Wiley and Sons, 1966), p.46. Ordinary derivatives are used since, if the curvature of the surface is neglected, γ is a function of T only.
3. Ostwald, Lehrbuch, vol.1, pp.523-525.
4. This is Einstein's justification for computing the surface energy from a static model, neglecting motion of the molecules, even though the mechanical theory of heat is based on a kinetic model. Einstein uses heat content (Wärmeinhalt) in the sense of internal kinetic energy.
5. The potential should also depend on another constant: the range of the intermolecular force, as noted in Pais 1982, p.47. Einstein in effect assumes the same range for all molecules, resulting in an incorrect dependence of unit surface and volume potential energies on the specific volume of the fluid. Einstein 1911a (without mentioning 1901) shows such an assumption to be untenable. The difficulty can be overcome if the potential energy is taken as a universal function of r/R , where R is the range of the force.
6. The expression given for the total potential energy can be transformed into the sum of volume and surface energy terms with certain assumptions about the nature of molecular forces (see, e.g., Hermann Minkowski, "Kapillarität," in Gesammelte Abhandlungen von Hermann Minkowski, ed. David Hilbert (Leipzig and Berlin: B.G. Teubner, 1911) vol.2, pp.333-336). Einstein, however, seems to have calculated the volume and surface energies directly. He may already have read Boltzmann 1898, cited in Einstein 1902b, which contains similar calculations in a discussion of capillary forces (pp.55-62).
7. After designating surface area by S , Einstein reverts to 0 in the following equation. The sign of the last term in this equation has been corrected.
8. Dimensional considerations show the following formula for K' to be incorrect. Einstein 1911a gives the correct formula for this constant, without mention of 1901.
9. The following expression is actually the surface potential energy per unit area.

10. Ostwald, Lehrbuch, vol.1, pp.528-530.
11. As indicated, K should be set equal to unity in the following formula.
12. The volume of the liquid is neglected in comparison with that of the vapor. This discussion of latent heat of vaporization is very similar to one in Weber Notebook II [1896-1900].
13. Ostwald, Lehrbuch, vol.1, pp.354-356 for Schiff's data, on which the following table is based.
14. Hans Landolt and Richard Börnstein, Physikalisch-chemische Tabellen, 2nd enl. ed. (Berlin: Julius Springer, 1894), pp.107-109 and 265-269.
15. The two results are not independent, however. The Clausius-Clapeyron equation with the approximations used may be written:
 $(\partial P/\partial T)_V = D_m'/Tv$. Using the identity $(\partial P/\partial T)_V (\partial V/\partial P)_T (\partial T/\partial V)_P = -1$ gives $D_m' = Tv\alpha/\kappa$. The Clausius Clapeyron equation is derived (without name) in Weber Notebook II [1896-1900] in the discussion of latent heat of vaporization. The existence of a thermodynamic relationship between Einstein's two results was noted in a review of 1901 by Otto Wiedeburg in Zeitschrift für physikalische Chemie 39 (1902): 378.
16. Ostwald, Lehrbuch, vol.1, pp.279, 398-399 for Mendeleev's formula. Einstein seems to be referring to the use of Schiff's data to test Eötvös' law, pp.541-543.
17. See Einstein to Grossmann, April 14, 1901.

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- 1902a "Ueber die thermodynamische Theorie der Potential-
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ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

April 12, 1982

Dr. Harry Woolf, Director
The Institute for Advanced Study
Princeton, NJ 08540

Dear Harry,

I was glad to hear that progress on remodeling the building has been going forward. I am of course aware, going back through our discussions over several years, that any programmatic content of the Einstein project would come under the jurisdiction of the Institute faculty, and that at our meeting in your office on February 10 you mentioned taking up the question with Professors Dyson and Clagett. I am eager to hear the result of your deliberations with them, since the institutional and academic setting of the project must be part of our long-range plans, now that we are free to make them. The institutional arrangements will no doubt be as important to the staff as the physical arrangements, and so we must take everything into account. I appreciate very much your looking into these matters.

With best wishes,

Sincerely,



Herbert S. Bailey, Jr.

/ba



March 31, 1982

C
O
P
Y

Professor Marshall Clagett
School of Historical Studies
Institute for Advanced Study

Dear Marshall:

The attached is for your information,
and perhaps you and Freeman will want to
talk to me about it at your convenience.
I leave the matter in your collective hands.

Sincerely yours,

Harry Woolf

Enclosures

March 31, 1982

Professor Freeman J. Dyson
School of Natural Sciences
Institute for Advanced Study

Dear Freeman:

The attached is for your information,
and perhaps you and Marshall will want to
talk to me about it at your convenience.
I leave the matter in your collective hands.

Sincerely yours,

Harry Woolf

Enclosures

COPY

cc. Freeman Dyson
Marshall Clagett

March 31, 1982

Mr. Herbert S. Bailey, Jr.
Princeton University Press
41 William Street
Princeton, New Jersey 08540

Dear Herb:

Thank you very much for yours of 24 March 1982. I am happy to report that progress continues in the remodeling of the building in which we will house the Einstein editorial project. I shall let you know when the process is complete and the offices are available for occupancy.

With regard to the second paragraph of your letter and the idea of having some programatic content within the framework and ongoing activities of the Einstein editorial project, I need to inform you that such endeavors come under the jurisdiction of the Faculty and that, as you know, Professors Dyson and Clagett represent the supervisory committee for the academic dimensions of the editorial project at the Institute. I am sharing your letter with them and I shall await their counsel in this matter.

As for the status of the staff with respect to the Institute, I see no ambiguity at all. They are employees of the project to whom we have extended the courtesy of our facilities, which means the use of the dining hall, and a ready welcome to them for attendance in the public affairs or activities of the Institute, such as concerts, public lectures and the like. Any other status, membership, Faculty status or the like is a matter for the Schools and shall be so placed before them.

Sincerely yours,

Harry Woolf

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President, HAROLD W. MCGRAW, JR. *Trustees*, JOHN TYLER BONNER,
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DONALD W. KOEPP, AARON LEMONICK, JOHN F. PECKHAM, GILBERT F. ROZMAN,
ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

March 24, 1982

Dr. Harry Woolf
The Institute for Advanced Study
Princeton, NJ 08540

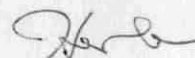
Dear Harry,

I have been thinking and talking with John Stachel about the future of the Einstein project. Our past difficulties seem to be clearing up, though we are still in process of working out the details of new arrangements with The Hebrew University. Also of course I am still looking for operating funds.

Another matter of concern, in accordance with our recent discussion, is the relationship of the Institute to the project. At one time we talked about other relationships beyond that of landlord, and I gather that that is something you are discussing further with Freeman Dyson and Marshall Clagett. I believe that the long-range health of the project does depend on having the right kind of organizational as well as intellectual environment, and the idea we once discussed of having something like a Program in Einstein Studies is still attractive. The main thing, of course, is to get on with the Edition, but it has proved helpful in other editions to have a certain amount of closely related scholarly activity. There is also the question of the status of the staff with respect to the Institute, which could make a difference both to the editor and to prospective associate editors and others. I shall hope to hear from you when you have had a chance to consider these matters further.

With best wishes,

Sincerely,



Herbert S. Bailey, Jr.

/ba

cc: John Stachel



The Complete Writings of Albert Einstein:
Research Grant Proposal Budget for
The Five Years Ending June 30, 1987

	Notes	<u>Year Ending June 30,</u>					<u>Total</u>
		<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	
A. Senior Personnel							
1. Editor (Professor Stachel)--	1						
Salary		\$ 50,000	\$ 54,500	\$ 59,400	\$ 64,700	\$ 70,500	\$ 299,100
Fringe Benefits		10,500	11,400	12,500	13,600	14,800	62,800
B. Other Personnel							
1. Associate Editor--	2						
Salary		45,000	49,100	53,500	58,300	63,500	269,400
Fringe Benefits		9,000	9,800	10,700	11,700	12,700	53,900
2. Assistant Editors (2)--							
Salary		60,000	65,400	71,300	77,700	84,700	359,100
Fringe Benefits		12,000	13,100	14,300	15,500	16,900	71,800
3. Editorial Assistant--							
Salary		18,000	19,600	21,400	23,300	25,400	107,700
Fringe Benefits		3,600	3,900	4,300	4,700	5,100	21,600
		<u>\$ 208,100</u>	<u>\$226,800</u>	<u>\$247,400</u>	<u>\$269,500</u>	<u>\$293,600</u>	<u>\$1,245,400</u>
D. Permanent Equipment	3	\$ 60,000	\$ --	\$ --	\$ --	\$ --	\$ 60,000
E. Travel--	4						
Domestic		\$ 4,500	\$ 1,100	\$ 1,200	\$ 1,300	\$ 1,500	\$ 9,600
Foreign		10,000	--	--	--	--	10,000
		<u>\$ 14,500</u>	<u>\$ 1,100</u>	<u>\$ 1,200</u>	<u>\$ 1,300</u>	<u>\$ 1,500</u>	<u>\$ 19,600</u>
G. Other Direct Costs--							
Computer Services	5	\$ 1,000	\$ 6,600	\$ 7,300	\$ 8,000	\$ 8,800	\$ 31,700
Other--							
Office Rent	6	14,400	14,400	14,400	14,400	14,400	72,000
Office Utilities	6	2,500	2,800	3,000	3,300	3,600	15,200
Other Office Expenses	7	6,300	4,700	5,200	5,700	6,300	28,200
Editorial Committee Expenses	8	7,000	4,400	3,000	3,300	3,600	21,300
		<u>\$ 31,200</u>	<u>\$ 32,900</u>	<u>\$ 32,900</u>	<u>\$ 34,700</u>	<u>\$ 36,700</u>	<u>\$ 168,400</u>
I. Indirect Costs (24%)	9	<u>\$ 41,500</u>	<u>\$ 45,300</u>	<u>\$ 49,300</u>	<u>\$ 53,800</u>	<u>\$ 58,600</u>	<u>\$ 248,500</u>
Total Budget		<u>\$ 355,300</u>	<u>\$306,100</u>	<u>\$330,800</u>	<u>\$359,300</u>	<u>\$390,400</u>	<u>\$1,741,900</u>
Less Institutional Cost Sharing (Editor)		60,500	65,900	71,900	78,300	85,300	361,900
Amount Requested From NSF		<u>\$ 294,800</u>	<u>\$240,200</u>	<u>\$258,900</u>	<u>\$281,000</u>	<u>\$305,100</u>	<u>\$1,380,000</u>

**ACTIONS ON
 BEFORE
 (ING)**

**SUMMARY
 PROPOSAL BUDGET**

FOR NSF USE ONLY

ORGANIZATION <i>Princeton University Press</i>				PROPOSAL NO.		DURATION (MONTHS)	
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR <i>John Stachel</i>				AWARD NO.		Proposed	Granted
SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A.B. show number in brackets)				NSF FUNDED PERSON-MOS.		FUNDS REQUESTED BY PROPOSER	
				CAL.	ACAD	SUMR	FUNDS GRANTED BY NSF (IF DIFFERENT)
							\$
) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)							
• () TOTAL SENIOR PERSONNEL (1-5)							
OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)							
) POST DOCTORAL ASSOCIATES							
4) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				1Y			124,000
) GRADUATE STUDENTS							
) UNDERGRADUATE STUDENTS							
) SECRETARIAL-CLERICAL							
) OTHER							
TOTAL SALARIES AND WAGES (A+B)							
FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)							24,600
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)							147,600
PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$1,000; ITEMS OVER \$10,000 REQUIRE CERTIFICATION)							
<i>Word Processing System</i>							60,000
TOTAL PERMANENT EQUIPMENT							60,000
TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)							4500
2. FOREIGN							10,000
PARTICIPANT SUPPORT COSTS							
1. STIPENDS \$ _____							
2. TRAVEL _____							
3. SUBSISTENCE _____							
4. OTHER _____							
TOTAL PARTICIPANT COSTS							
OTHER DIRECT COSTS							
1. MATERIALS AND SUPPLIES							
2. PUBLICATION COSTS/PAGE CHARGES							
3. CONSULTANT SERVICES							
4. COMPUTER (ADPE) SERVICES							1,000
5. SUBCONTRACTS							
6. OTHER							30,200
TOTAL OTHER DIRECT COSTS							31,200
TOTAL DIRECT COSTS (A THROUGH G)							273,500
INDIRECT COSTS (SPECIFY) <i>34% of Salaries</i>							
TOTAL INDIRECT COSTS							41,500
TOTAL DIRECT AND INDIRECT COSTS (H + I)							315,000
RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS GPM 252 AND 253)							
AMOUNT OF THIS REQUEST (J) OR (J MINUS K)							294,000
PI TYPED NAME & SIGNATURE*				DATE	FOR NSF USE ONLY		
ST. REP. TYPED NAME & SIGNATURE*				DATE	INDIRECT COST RATE VERIFICATION		
					Once Checked	Date of Rate Sheet	Initials - DGC

PRINCETON UNIVERSITY PRESS

The Complete Writings of Albert Einstein:
Research Grant Proposal Budget For
The Five Years Ending June 30, 1987--

Notes To Budget

1. The salary and fringe benefits of Professor Stachel, the Editor, are expected to be paid from a one million dollar endowment received from Mr. Harold McGraw.
2. Budget allows for a 9% salary increase annually for the Associate Editor, the two Assistant Editors, and the Editorial Assistant. Fringe benefits are budgeted at 20% of salary, the current average percent applicable to Princeton University Press personnel, and is comprised of the following:
 - Pension and social security 15%
 - Medical Insurance 4
 - Group Life Insurance, Long-Term Disability Insurance 1

20%
3. The \$60,000 equipment expenditure represents the estimated cost of the word processing system noted in the "Project Description."
4. A substantial part of the travel costs budgeted for 1982/83 covers trips within the United States as well as abroad in search of documents to add to the Einstein Archive.
5. Computer services includes a maintenance contract for the word processing system (beginning in the second year), estimated to cost \$5,500 in 1983/84.
6. Beginning in the Spring of 1982, the Einstein Project staff is expected to be housed in newly renovated quarters located on the grounds of The Institute for Advanced Study. Annual rent for the Project offices--consisting of 1,200 square feet--has been set at \$14,400 by the Institute. Utilities--heat, light, and water--will be additional.
7. The "Other Office Expenses" budget for 1982/83 is comprised of the following components:

Office Supplies	\$ 400
Postage (regular)	700
Postage (special)	2,000
Photo-copying	1,500
Telephone and telegraph	1,200
Books, Subscription, etc.	500
	<u>\$6,300</u>

"Special" postage (budgeted for 1982/83 only) covers an extensive mail search to uncover documents to add to the Einstein Archive.

8. Budgeted Editorial Committee expenses were computed as follows:

	<u>No.</u> <u>Meetings</u>	<u>No.</u> <u>Attending</u>	<u>No. of</u> <u>Man Days</u>	<u>Per</u> <u>Diem</u>
1982/83	4	6	24	\$ 250
1983/84	2	6	12	275
1984/85	1	6	6	300
1985/86	1	6	6	330
1986/87	1	6	6	365

In addition, the budget includes four days of special consultation with Editorial Committee members in each of the five years, at the foregoing per diem rates.

9. The indirect cost allocation percentage (equal to 24% of salaries) was developed out of historical and projected experience at Princeton University Press (space costs are excluded since as noted the Project will be located at the Institute for Advanced Study). Here is a broad breakdown of the composition of the 24%:

Administrative and Accounting Salaries	14.5%
All Other General and Administrative Expenses (excluded stationery and supplies, postage, telephone, which are all treated as direct costs. Also, excludes non-allowable expenses: interest expense and contributions	<u>9.5</u>
	<u>24.0%</u>

Since our Press has never established an indirect cost rate, the National Science Foundation is being requested to make arrangements with the appropriate federal negotiating agency so one can be established. Accordingly, we would like to be audited as soon as possible.

Note: Throughout the budget, a 10% annual inflation factor has been taken into account (except that a 9% inflation factor was used for salaries and fringe benefits).

Princeton University Press

41 WILLIAM STREET
PRINCETON, NEW JERSEY 08540

(TEL. 609-452-4900)
(TELEX 181160)

President, HAROLD W. MC GRAW, JR. *Trustees*, JOHN TYLER BONNER,
WILLIAM G. BOWEN, ROBERT G. GILPIN, WU-CHUNG HSIANG, ALVIN B. KERNAN,
DONALD W. KOEPP, AARON LEMONICK, JOHN F. PECKHAM, GILBERT F. ROZMAN,
ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

TO: The Editorial Advisory Board DATE: March 18, 1982
 of the Einstein Papers
 Project COPIES: Avraham Harman
 Milton Handler
FROM: H. S. Bailey, Jr. John Stachel

SUBJECT: A Change in Responsibilities

Shortly before Helen Dukas's death, an arrangement had been completed between the Estate of Albert Einstein (Otto Nathan and Helen Dukas, Trustees) and the Hebrew University of Jerusalem transferring ownership of the original Einstein Archive, along with copyrights and all other rights in relation to the Papers, to the Hebrew University. Thus the Hebrew University takes the place of the Einstein Estate in the contract with Princeton University Press for preparation and publication of the Einstein Papers, with the single exception that the Hebrew University will not share in the responsibility for raising funds for the project. Princeton University Press now assumes sole responsibility for fund-raising; indeed nearly all the funds already raised have been raised by the Press.

The Press will continue to be the administrator of the project, with general supervision exercised jointly by the Press and the Hebrew University. For this purpose the Hebrew University will appoint a representative to consult with the Press on any problems that may arise.

I want to express my personal satisfaction at the new arrangements.

H. S. Bailey Jr.



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Einstein Project

February 26, 1982

To: Editorial Advisory Board
From: John Stachel
Subject: Correction to Draft NSF Proposal

Peter Bergmann kindly pointed out that I had inadvertently omitted the name of Professor Nathan Rosen from the list of living co-workers of Einstein on p. 26 of the Draft. I have recently visited Dr. Rosen at the Technion in Haifa, and discussed with him a number of questions about his correspondence with Einstein. My apologies to Professor Rosen for this oversight.



HW

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February 10, 1982

TO: The Editorial Advisory Board

FROM: H. S. Bailey, Jr.

Since writing the enclosed memo I learned that Helen Dukas died last night. Many of you, I know, were friends of hers. Her death is a real loss to all her friends. We are sorry also that her special knowledge about Einstein will not be available to help us with the Edition.



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February 10, 1982

TO: Members of the Editorial Advisory
Board of The Papers of Albert Einstein

COPY: Dr. Otto Nathan

FROM: Herbert S. Bailey, Jr.

I want to thank those of you who replied to my memorandum of October 28, 1981. Professor Stachel joins me in expressing appreciation; your comments will be taken into account as we proceed with the work.

I am enclosing a copy of Professor Stachel's annual report.

I think you should know that recently we received an anonymous letter with a thinly veiled threat to attack the project publicly, saying that John Stachel is unfit to be the Editor because (1) his father was once a leader of the American Communist Party and (2) because in 1955 Stachel wrote an article in a Communist journal (Professor Stachel cannot identify the article). It is said that on these grounds, and presumably on the grounds of Stachel's acknowledged Marxist political views, he is not a suitable Editor of Einstein's writings on Zionism or on Soviet science.

This could perhaps lead to an imbroglio reminiscent of the McCarthy days. However, on the basis of your recommendation, Professor Stachel's record as a scholar, and our observation of his work here, our Trustees stand firmly behind him as an appropriate, able, and objective Editor. Moreover it has been planned from the beginning, at Professor Stachel's request, that he would have appropriate associate and assistant editors in the field of modern European history, politics, and other areas in which he is not a specialist. Thus, considering both Professor Stachel's stated intentions and the expected reviews of manuscripts before publication, it seems extremely unlikely to us that the Edition would be improperly biased in any way.

We thought you should have this information because of your recommendation for the selection of Professor Stachel as Editor and your continuing support of him at the meeting of May 6, 1978. We also want to be sure that you understand our position.



EDITORIAL WORK ON THE EINSTEIN PAPERS

Annual Report for 1981
to the

Einstein Estate and Princeton University Press

Until mid-October of this year, editorial work on the Einstein papers was made difficult by the fact that the duplicate Archive prepared for editorial purposes was under seal in the Princeton Library, pending final resolution of the issues under arbitration between the Press and the Estate. During this period I prepared a preliminary catalogue of materials to be included in the first volumes of papers (up to the 1914 move to Berlin). I also continued research on various aspects of Einstein's work during the period to be covered in these volumes. Topics studied included the origins of special relativity theory, the early stages of the development of the general theory, and Einstein's work on the quantum theory. I give a number of invited talks based on this work, have written several articles and am working on others on these topics. I continued to expand and update the Einstein bibliography originally prepared in 1977. I secured copies of many new items to add to the collection of material on Einstein's life and work (and related topics) which I have been collecting over the last few years as an editorial resource library, and spent a good deal of time reading this material as necessary background information for the editorial work. I have also been in contact with a number of scholars in this country and

abroad working on aspects of Einstein's life and work, exchanging information with them.

A study was begun of the feasibility of utilizing word-processing equipment to facilitate the editorial work on the papers, with the ultimate aim of preparing copy on magnetic tapes in a form that can be directly handled by the Press' computerized typesetting equipment. A recent report to the NHPRC ("Documentary Editing in Crisis: Some Reflections and Recommendations") recommended that all major historical editing projects use word processors as a method of significantly reducing the time and expense of such projects. The Einstein papers present some special problems, however, compared to those usually encountered by projects dealing with the papers of major American historical figures, such as the Jefferson papers, which has already made the transition to word processing equipment. First of all, material in several languages must be handled simultaneously. Even more of a problem is presented by the need to handle a large number of equations and other expressions involving many unusual mathematical symbols. The Princeton University Computing Center has been investigating word processors, and we were able to look at some of the models currently available and to discuss our needs with their personnel. We have drawn up a list of optimal requirements for such a system (copy attached); but finding a system that meets all these requirements may not be possible. It was decided to wait until we had done more actual editorial work, and were thus in a better position to assess priorities, before deciding which system might represent the

best compromise between our needs and the state of the art.

The signing of the Editorial Contract in mid-September permitted the initiation of a new phase in the editorial work. Dr. Robert Schulmann, a German historian who had previously been working on the editing of the Steuben papers, was hired as Project Historian for one year initially. Since there was a need for more space than the Institute for Advanced Study could immediately supply, the Einstein Office (see Clause 4 of the contract) has been established temporarily in the Press building. It is hoped that we shall be able to move the Einstein Office to the Institute when space becomes available and a suitable agreement has been worked out with the Institute (see Clause 4 of the contract).

In early October, at the time of the move to the Press building, the duplicate Archive was transferred to the Einstein Office and unsealed. This allowed work on transcription and annotation of documents to begin. In keeping with the basically chronological plan for publication of the papers (see the Bailey letter of October 28, 1981 to the Editorial Advisory Board, copy enclosed) we began work on the early documents. First of all, a standardized method of transcription of hand-written documents had to be developed. Dr. Schulmann and I worked on this problem, and have now developed what we feel to be a satisfactory system. It is basically a literal transcription of the text, with expansions of abbreviations; some corrections are also indicated, but changes of the text to conform to a uniform editorial style are being left until a later stage of the editorial work.

Mrs. Olga Griminger has been hired as a part-time Editorial

Assistant, and (in addition to secretarial work) she and Dr. Schulmann have begun work on transcription of documents. Their work is greatly facilitated by the availability of earlier transcriptions of many documents made by Miss Dukas, on the basis of her unparalleled familiarity with Einstein's handwriting. Not being familiar with Gothic script, in which most of the early documents are written, I have not so far done any of the actual transcriptions. But all three of us consult on difficult points and I am able to be of some help, particularly when physical or mathematical symbols and terminology is involved. I should like to pay special tribute here to Dr. Schulmann's skill, patience and perseverance in this arduous but important work. He returns over and over to puzzling features of the text, sometimes coming up with the correct interpretation of a squiggle weeks after we first encountered the problem.

I have started to work on the annotation of the first two papers published by Einstein. No manuscripts exist for these early papers (1901-02) and one must work from the published text. Very little in the way of commentary on these papers has been published, in contrast to the situation for many of Einstein's later works. So I have to do a great deal of searching in turn-of-the-century scientific journals and books to find background material needed to annotate the papers. I will soon have an annotated version of the first paper available, including headnote and footnotes, which I will send to several Einstein scholars to get some critical feedback on my approach.

Clearly, a large-scale search for additional Einstein

documents will have to be made to supplement the already formidable resources of the Einstein Archive before the Collected Papers can appear. We had originally hoped to start such a search this year; this hope was based on the original estimate that the results of the Berkeley project on "Sources for the History of Twentieth-Century Physics" would be available by the end of 1980. This project has gathered information on the whereabouts of over 600,000 letters from or to about 6000 physicists; and it would seem wise to have this information available in planning our search. We have been in regular contact with Dr. Bruce Wheaton, Director of the "Sources" project, who recently informed us that the project will be unable to supply us with the needed information on Einstein letters until mid-1982. Dr. Schulmann is making a preliminary visit to Berkeley this January to see if it might be possible to get some of this information earlier if he were to spend some time there. If not, we shall start looking for Einstein documents in places not likely to have been covered by the Berkeley search, e.g., the Swiss Patent Office.

I have been at work on a new grant application to the National Science Foundation. This will expand and fill in the details of the plan outlined in the Bailey letter of October 28, 1981 to the Editorial Advisory Board. Assuming that we are successful in getting the needed funding from this or some other source, I hope that several Associate and/or Assistant Editors (as appropriate to seniority and experience) can be appointed in the coming year, with the approval of the Estate and Press (see Clause 4 of the contract). The annual budget

called for in the Contract will be included in the NSF application, a draft of which is now nearly completed. A copy of this draft will be submitted to the Estate and Press for comments as soon as it is ready.

I also hope to appoint an Editorial Committee soon (see Clause 2 of the contract and the Bailey letter of October 28, 1981 to the Editorial Advisory Board), to assist me in completing plans for the edition, and to consult on details of the actual editorial work.

Now that the duplicate Archive is available again, it is possible to resume contacting living correspondents of Einstein. In particular, it seems important to contact the living co-workers of Einstein, even though their contacts with him occurred during a later period than that currently being edited. This group includes Drs. Valentine Bargmann, Peter Bergmann, Banesh Hoffmann, Bruria Kaufmann and Ernst Straus. Comments on their correspondence and published and unpublished papers with Einstein will be secured by mail or personal interviews, as appropriate, during the coming year.

Mr. John Norton, an Australian philosopher of science who has just completed a Thesis on "The Historical Foundation of Einstein's General Theory of Relativity" at the University of New South Wales, has come to Princeton to do further work on the origins of the general theory. He will be spending about a year here, at no expense to the Einstein Office beyond the provision of office space and related facilities. This is a gratifying first instance of my hope that the Collected Papers project will become a center for research on topics

related to Einstein's life and work. The results of such work will serve to benefit the editorial work proper, both directly and indirectly. Dr. Michel Biezunski, a French physicist who presented a Thesis on "La diffusion de la théorie de la relativité en France" to the University of Paris VII in 1981, will be coming to Princeton for a short visit in January to explore the possibility for future cooperation. He is interested in documenting Einstein's 1921 visit to the United States, in particular the reaction in the Yiddish press. This work would clearly be of great direct benefit to the editorial work.

It is an old pleasure to again acknowledge the financial assistance of the Sloan Foundation during the last year. Its support over the last few years enabled the project to continue during a period when no other source of support was available.

It is a new pleasure to acknowledge the endowment of the editorship of the Einstein papers by Mr. Harold W. McGraw. His enthusiasm for the project has been gratifying. My colleagues and I will do everything possible to justify the confidence he has placed in us.

EINSTEIN PROJECT:

WORD PROCESSING REQUIREMENTS

POTENTIAL USES

Transcription of documents

Writing and editing of letters, articles and book copy

Printing acceptable copies of documents, letters, articles

Storing up to one volume of Einstein papers in memory of small CPU

Draw upon information stored in larger (mainframe) computer memory:
e.g., Control Index, volumes already published

Prepare and search through indices for each volume, bibliographies, etc.

Produce, file, store and search through correspondence

Prepare tapes for automatic typesetting

CAPABILITIES DESIRED

Produce and store:

Characters of English, German (most used) and occasionally
French, Russian, Greek, Hebrew alphabets

Mathematical symbols, numbers, etc., combined in complicated formulae

Various typefaces: italics, boldface, etc.; sizes of type; subscripts,
superscripts, etc.

Display copy on screen and make changes in displayed copy while holding the
original version in CPU, e.g., the usual copy editing functions: transpose
words, sentences, paragraphs; insert and delete material, add footnotes, etc.,

Prepare and store documents in standard format, while variations are inserted
as copies are produced (e.g., basic letter with various names and addresses)

Print-out copies with legibility comparable to typed copies

CPU capable of holding at least one volume of Einstein papers, with quick
access to all material in internal and external storage (floppy disks?)

Automatic reformatting of material (e.g., transform line-by-line transcription
into ordinary, justified copy)

Store and search through alphabetically and numerically arranged material

Maintain filing system for correspondence

Capabilities Desired - Continued

Be able to display and print-out different character sets simultaneously (e.g., words and formulae)

Ability to use printer and editing terminal simultaneously on different jobs

Capability for expansion to shared-logic system in future (probably 2 or 3 terminals maximum)

Ability to communicate easily with mainframe computer

Ability to prepare material in form that can be used directly for type-setting

HARDWARE NEEDED

Video display terminal(s)

CPU with sufficient internal memory

External memory

Printer

Interface for communication with larger computer and output to typesetter

SOFTWARE NEEDED

Text Editor

Document Formatter

Data Base Management System

Back-up System

ON SITE MAINTENANCE

Princeton University Press PRINCETON, NEW JERSEY 08540 (TEL. 609-452-4900)

President, HAROLD W. MC GRAW, JR. Trustees, CYRIL E. BLACK, JOHN TYLER BONNER,
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ALVIN B. KERNAN, DONALD W. KOEPP, AARON LEMONICK, RICARDO A. MESTRES,
JOHN F. PECKHAM, ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT

TO: The Editorial Advisory Board of DATE: October 28, 1981
THE PAPERS OF ALBERT EINSTEIN
FROM: Herbert S. Bailey, Jr. COPIES: Otto Nathan
John Stachel

Now that the legal obstacles to work on THE PAPERS OF ALBERT EINSTEIN are out of the way, we would like views of members of the Board on the following questions, as well as any others that may occur to them.

Plan to have a staff of four:

Editor (Stachel, physicist) with principal overall responsibility as well as major responsibility for physics annotations

Associate or Assistant Editor (historian of science) with major responsibility for history of science annotations, search for documents

Associate or Assistant Editor (historian) with major responsibility of archival aspects of project, general historical annotations

Editorial Assistant to be responsible for day-to-day running of office, transcription of documents

Naturally such a small staff can not operate on rigid, hierarchical principles. There will be discussion of many editorial decisions, and a sharing of responsibility for their execution. Some reassignment of particular tasks based upon the special talents of the individuals filling these posts is also possible. Suggestions of names for the unfilled positions are solicited.

The basic plan of the edition is chronological, with work to proceed sequentially on various periods:

- A. Youth and Swiss Years 1879-1914
- B. Berlin Years 1914-1933
- C. American Years 1933-1955



Work has already started on transcription and annotation of material from the first period. Question: Should the volumes be strictly chronological; or should (for example) published and unpublished papers on the one hand, and correspondence on the other, appear in separate but coordinated volumes?

For the first period, it is planned to include all of the few letters to Einstein that have been uncovered, as well as, naturally, all of Einstein's letters. For later periods, where a much greater volume of material has been preserved, more selectivity may be necessary in dealing with letters to Einstein. It is also planned to document Einstein's appointment to and activity at the Swiss Patent Office, as well as his academic positions at Bern, Zürich, Prague, the ETH and Berlin. This will involve the search for and inclusion of a number of third party documents. Some other third party documents, such as letters describing significant contacts with Einstein, will also be referenced or included.

A major search for new documents is planned. Contact with the Berkeley project "Inventory of Sources for the History of Twentieth Century Physics" suggests that the main effort wait until the results of their extensive search for letters become available in mid of late 1982. However, it is already clear that a number of archives will have to be contacted and probably visited; work on these contacts can begin before then. Leads or other suggestions for this search are solicited.

It is planned to appoint a small Editorial Committee, to be available for steady consultation with the staff on problems arising in the planning and editing of the edition. The composition of the committee might well vary with the period being edited. For example, in the first period there is no documentation of any political or social activity by Einstein, while questions of his relationship to the 19th century physics tradition are of major importance. For the second period, questions of Einstein's relationship with the pacifist movement, the Zionist movement, and of his place in the Weimar milieu are of major importance. The membership of the Committee--envisaged to be about half a dozen--could reflect these changing emphases. Suggestions of names for the Committee are solicited.

It is generally agreed now that documentary editing must take full advantage of the latest technological innovations. It is planned to use word-processing equipment extensively in the project, from the initial stage of transcription of documents to the final stages or preparation of camera-ready copy and indexing. Our project has several unique problems compared to other recent historical editing projects that have been using word-processing equipment with success. For example, we have documents in a number of languages, and involving a great many scientific symbols. Any advice on choosing suitable equipment from the growing array of word processors is welcome.

We shall be grateful for your advice on these matters.

W.S. Bailey Jr.

February 11, 1982

Professor Marshall Clagett
School of Historical Studies

Professor Freeman Dyson
School of Natural Sciences

Gentlemen:

Thank you very much for agreeing to serve as a Faculty committee for the academic supervision of the editing of the Einstein papers, whose activities will return to our campus when the remodeling of the building at 320 Olden Lane is completed.

Sincerely yours,

Harry Woolf

THE INSTITUTE FOR ADVANCED STUDY

HR

February 3, 1982

To: Harry Woolf
From: Allen Rowe
Subject: Einstein Papers

I spoke with Herb Bailey today and told him that the rent for 320 Olden would be \$ 1,200 per month plus utilities. I estimated utilities at \$ 2,500/year.

He said you had mentioned last summer that we were installing a computer that might be able to handle their word processing needs. I told him we had such a computer and perhaps something could be worked out. I gave him Jim Gettys' phone number to investigate the feasibility of using the system.

We have a meeting with Herb Bailey and John Stachel on Friday, February 12 at 11:00 a.m.

Am

AIR:mw

*meeting changed to 2:00 p.m., 10 Feb 1982
HR*

THE INSTITUTE FOR ADVANCED STUDY

February 3, 1982

To: Harry Woolf
From: Allen Rowe
Subject: Rent - 320 Olden

I have looked at the rental of 320 Olden from several angles to get a sense of what rent to charge. The total net usable space (including entrance foyer and common room but excluding bathrooms) is 1177 square feet.

1. I asked Robert Dougherty of Stewardson & Dougherty what the space might rent for commercially. He had Toby Laghlin of his office call me since Toby is their commercial rental expert. He said that the going rate is \$ 12 to \$ 14 per square foot, but unique space such as ours might go for \$ 15. The rate is sans utilities.
2. I depreciated the improvements (\$ 110,000) over twenty years and added that to the rental we received prior to the improvements. This resulted in a rate of \$ 10 per square foot.
3. I took the total cost of operating the Academic buildings (less utilities) and divided by the total square footage of usable space and a rate of \$ 8.76 resulted.

If we round the square footage to 1200 for ease of calculating, the monthly rate of \$1 per square foot would be equal to \$100 per month. Therefore, twelve dollars per square foot would equal twelve hundred dollars per month. The range within which we could work is \$ 900 to \$ 1500 per month (provided they pay for the utilities).

The choice is yours.



Princeton University Press

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ARTHUR H. THORNHILL, JR., THOMAS H. WRIGHT, THEODORE J. ZIOLKOWSKI

January 26, 1982

Dr. Harry Woolf, Director
The Institute for Advanced Study
Princeton, NJ 08540

Dear Harry,

Here is the draft grant proposal to NSF for the Einstein Papers project. I am particularly anxious for you to see it before it is sent out to make sure that the references to the Institute are satisfactory. You will note page 2 especially. Of course you will be seeing it also in its final form, complete with budget, as a member of the Editorial Advisory Board. We will be working on the budget next week, when John Stachel returns from his trip.

I was delighted to hear that work is going ahead well on the new office space that will be available for the project. We still have to work out detailed arrangements for this, and I would like to discuss such arrangements with you in the near future. John is of course also very interested in the way in which the Einstein office would fit in to the Institute.

Please give me a ring as soon as you have had a chance to read this, since we should get in our application to NSF quite soon.

With many thanks for your continuing interest and help.

Sincerely,



Herbert S. Bailey, Jr.

/ba

cc: John Stachel



DRAFT - GRANT PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

This proposal is a request for financial assistance from the National Science Foundation over the next five years for partial support of the editorial work on the first series of volumes of the Collected Papers of Albert Einstein (hereafter denoted "Papers"). This first series will cover the period from Einstein's birth in 1879 up to his move to Berlin in April, 1914.

History and Governance of the Project

In 1971 the Trustees of the Einstein Estate (hereafter "Estate") and the Princeton University Press (hereafter "Press") entered into an agreement jointly to sponsor the preparation of the Papers for publication by the Press. They envisaged a complete, letterpress edition of the works of Albert Einstein, published and unpublished, including his correspondence, as well as such other documents and editorial material as were deemed important for the understanding of these writings. It is estimated that the Papers will comprise twenty or more volumes.

An Editorial Advisory Board was established, with members appointed jointly by the Estate and the Press, to assist in assuring the scholarly quality of the edition. This Board has already been consulted on such questions as the appointment of an editor and the general plan of the edition, and will continue to be consulted on matters of general policy.

In June 1976 Dr. John Stachel was appointed Editor of the Papers, and started work in January 1977. Differences that soon arose between the Estate and the Press over how to proceed impeded work on

editing the Papers for some time. Pending resolution of these differences, Dr. Stachel prepared a complete duplicate of the Einstein Archive for use in the editorial work, and a Control Index to the 43,000 documents in the Archive. A second duplicate of the Archive was made and placed in Seeley G. Mudd Library on the campus of Princeton University, together with a copy of the Control Index, for the use of scholars. A Guide to the Duplicate Archive was also prepared (Copy appended). This work was supported by grants from the NSF and the Sloan Foundation.

The issues between Estate and Press were brought to arbitration in 1979. The Arbitrator found in favor of the Press position, and confirmed Dr. Stachel in his position as sole Editor (Copy of the Decision appended). This decision was upheld in the courts of New York State, final action being taken by the Court of Appeals in 1981.

As directed in the Arbitrator's decision, Dr. Stachel signed a contract with the Press in September 1981 setting forth the terms of the editorship (Copy of Contract appended). The Estate has declined to sign this contract. Editorial offices (hereafter "Einstein Office") were temporarily set up in the Press Building, pending the availability of sufficient office space at the Institute for Advanced Study (hereafter "Institute"), and negotiation of suitable, detailed cooperative arrangements between the Press and the Institute.

The editorial copy of the Einstein Archive has been placed in the Einstein Office. Pending the securing of sufficient funding for the appointment of a permanent staff, Dr. Robert Schulmann, an historian specializing in German history who had previously worked on the Steuben papers, has been appointed to the temporary position of Staff Historian

(vita appended); and Mrs. Olga Griminger has been appointed a part-time Editorial Assistant (vita appended). Both are completely bilingual in German and English. Work was started on the transcription and annotation of texts for the early volumes of the Papers.

As noted above, the Editorial Advisory Board will continue to function in a general advisory capacity (current membership list appended). In addition, the Editor is mandated by his Contract to appoint a small Editorial Committee to work closely with him on formulation of detailed editorial policy and to provide expert advice in various fields. In addition to the Editor, the permanent staff will include several Associate or Assistant Editors, and Editorial Assistants; the exact title will depend on the experience and the level of seniority of each individual chosen. (For a more detailed discussion see the Sections on the Editorial Committee and the Permanent Staff).

Once it has been set up, this editorial structure will function with the guarantees of normal editorial freedom provided by the Editor's Contract. Supervision of the editorial work of the permanent staff will be exercised by the Editorial Committee; the Estate and Press with the advice of the Editorial Advisory Board; and the Institute (should current plans be carried out).

Currently, the editorial work is receiving funding from two sources. Mr. Harold McGraw has donated one million dollars to the Press, the income from which serves to endow the editorship and help meet other expenses of the project. The Sloan Foundation has also given a series of short-term grants over the last four years, the latest of which is for \$120,000 to cover the period from May 1, 1981 until June 30, 1982.

The Editorial Committee

The Editorial Committee will consist of a small group of people (about half a dozen) with expert knowledge in areas of particular importance to the editorial work. Its function will be to provide a forum for detailed collective discussion of editorial plans with the permanent staff, as well as a resource for individual consultation on particular problems arising in the course of the editorial work. It is anticipated that its composition may change as the work proceeds from one phase to another. For example, it seems important at an early stage of the work to have regular advice on general editorial policy questions from someone with a great deal of editorial experience on some other collected papers project; such advice will be needed more rarely once the details of editorial policy have been set. On the other hand, when the editorial work reaches the period when Einstein started to express himself and receive correspondence on political and social issues, expert advice will be needed from historians familiar with the Weimar period, the pacifist movement, the Zionist movement, the New Deal period, etc.; but such advice will rarely if ever be needed for the period before the First World War.

For the period covered by this grant proposal, the Committee should include experts in the following areas:

editorial work on a major collected papers project

history of science, especially late nineteenth and early twentieth-century physics

theoretical physics, especially statistical physics,
relativity theory and quantum theory

philosophy of science, especially philosophy of physics
and the early positivist movement.

Persons with qualifications in one or more of these areas who have
also done work on Einstein would be especially desirable, of course.

To give an idea of the caliber of people desired, the following
names might be mentioned:

Editors: Nathan Reingold, Arthur Link, Mary Jo Kline,

Historians of Science: Russell McCormach, Paul Forman, Martin Klein,
Gerald Holton,

Physicists: Peter Bergmann, Abraham Pais, Valentine Bargmann,

Philosophers of Science: Adolf Grünbaum, Robert S. Cohen, Carl Hempel.

It is planned to convene the Committee as a whole several
times in the early stages of the work, and thereafter at least once a
year. Consultations with individual members would take place by tele-
phone or mail; or by visits when necessary.

Permanent staff

It is planned to build up a permanent staff which will include the Editor, three Assistant or Associate Editors (title to depend on level of experience and seniority of the individual), and one or two Editorial Assistants (who would not be expected to have an advanced academic degree). In a small group like this, any "table of organization" cannot be too rigidly applied in the selection of personnel. The actual work done by each individual will depend on his or her particular skills and other strengths and weaknesses, and will also change with the changing requirements of the project. Thus (except for the Editor), the following descriptions should not be interpreted as an immutable blueprint, but rather as an indication of the range of skills that we hope to have represented on the staff, and the range of functions to be performed by this staff.

Editor: overall leadership of the entire project, and ultimate responsibility for all decisions. Major background in special and general relativity theory; good knowledge of quantum theory, and philosophical problems of modern physics. Primary responsibility for editorial annotation in physics. Aid in transcription of handwritten documents.

Associate Editor: will assume a major share of the executive responsibility. Major background in the history of science, primarily late nineteenth and twentieth-century physics. Primary responsibility for editorial annotations bearing on history of science. Aid in transcription of handwritten documents.

Assistant Editor: major background in general history, primarily late nineteenth and twentieth-century German history. Some experience on a large historical editing project desirable. Primary responsibility for general historical annotation, the search for new documents, and transcription of handwritten documents.

Assistant Editor: major background in philosophy of science, particularly in late nineteenth and twentieth century philosophy of physics. Some background in statistical physics also desirable. Primary responsibility for editorial annotations bearing on philosophy of science. Aid in transcription of handwritten documents.

Editorial Assistants: management of Einstein Office, including secretarial duties; primary responsibility for word processing and computer work. Assist in transcription of handwritten documents. Primary responsibility for preparation of indices.

All of the staff members should have at least a passive knowledge of German, and bilingual fluency is desirable. Some knowledge of French, Spanish or Italian is also useful.

Plan of the Edition

The aim of this edition of the Einstein Papers is to document fully Einstein's thought and activities as they emerge from his writings and correspondence. The edition will include all available published articles, unpublished manuscripts, notebooks and letters by Einstein; as well as all significant letters to him that have been preserved. Third party documents which shed significant light upon his activities will also be included. This edition is aimed at a scholarly audience, but one drawn from a wide variety of fields. Although Einstein's creative work was primarily in the area of physics, his writings and activities had a far-reaching impact in such fields as philosophy, politics, education, and Jewish affairs, to name only a few. Physicists, historians and philosophers of science, psychologists interested in the creative process, and historians of the Zionist and pacifist movements are some likely users of the Papers. An edition of the documents in their original languages, including all significant textual variations, will best meet the needs of such readers. Sufficient annotation to facilitate reading of the texts by such a scholarly audience will be provided.

In keeping with the aim and intended audience of this edition, as well as recent practice in editing the papers of major historical figures, the documents will be organized chronologically. To facilitate use of the material, it will be issued in two parallel series: The first series will include Einstein's published articles,

unpublished manuscripts and notebooks. The second series will include his correspondence as well as third party letters and documents of significant bearing on his career and public activities. Each series will appear in separate volumes, apart from a single volume of juvenilia; but all material from the same chronological period will be edited together so that volumes from both series can be issued in parallel with cross-references. It has been suggested that the first series be further subdivided into separate volumes of scientific and non-scientific papers. There are significant arguments for and against such a subdivision. Since there are no non-scientific articles or manuscripts by Einstein preserved from the period covered by this proposal (1879-1914) - nor is there any reason to think that any will be uncovered - it seems prudent to postpone a decision on this question until the permanent staff and Editorial Committee have discussed it.

Within the basically chronological plan of organization of the Einstein Papers it is convenient to subdivide the chronology into several periods. Any such subdivision will always be somewhat arbitrary, and the editorial work will basically be a continuous process. However, a consideration of Einstein's career suggests a fairly clear subdivision into four broad periods:

- I The Student Years (1879-1900)
- II The Swiss Years (1900-1914)
- III The Berlin Years (1914-1933)
- IV The Princeton Years (1933-1955)

It may prove advantageous to further subdivide the last two periods because of the large amount of material preserved from the Berlin and Princeton years.

This proposal covers editorial work on the first two periods. The editing of the material from these periods is discussed in the Sections on The Student Years and The Swiss Years.

Editorial Method

Since Julian Boyd's pioneering work on the Jefferson papers, historical editing projects have developed a number of editorial methods to cope with their particular needs.¹ Our aim is to present original texts with as little editorial encumbrance as possible and with an eye to explanation rather than interpretation.

In the present phase of transcription, prior to selection of a word-processing system, and before we have the input of the permanent staff and Editorial Committee on editorial method, we have adopted a literal method of transcription, with a few exceptions: interlineations are brought down the line, the first word in a sentence is always capitalized and the last word followed by a period, no matter what the writer does. To facilitate conversion to the final transcription style, we are noting slips of the pen, expanding abbreviations, and indicating points in need of annotation at the foot of the transcripts. Copies of several sample pages of manuscript together with transcription are appended.

In preparing the texts for publication we plan to use an expanded method. This will involve expanding non-standard abbreviations, and silently correcting trivial slips of the pen. Uncertain items in the text will be indicated. We will develop a style sheet, listing all our conventions, during the coming year.

¹ Frank Freidel (ed.), Harvard Guide to American History, Rev. Ed., I, pp.27-36 (The Belknap Press of Harvard U. Press, 1974).

Annotation of documents will include general introductory material, as well as headnotes and footnotes for individual documents where needed. Headnotes will provide additional information about the document. Footnotes will comment on names, places and other obscure points in the text, explain problems in transcription, and give bibliographical references. In addition, there will be a general introduction to the edition, including a discussion of editorial method, as well as introductory material for the larger subdivisions of the Papers. Chronologies will be included for the volumes in the second (correspondence and document) series. Each volume will contain detailed name and subject indices. Cumulative indices covering all the preceding volumes will be included from time to time.

We have appended an annotated version of Einstein's first published paper and several of his letters, as a sample of the proposed editorial method.

The Student Years

The material from the Student Years (1879-1900) should fit into one volume, barring the highly unlikely discovery of a large number of new documents from this period.

The known documents include the following items by Einstein:

- 1) "Über die Untersuchung des Aetherzustandes im magnetischen Felde,"
an essay of six ms. pp. written in 1895;
- 2) Essays and Exercises from the Aargau Kantonschule:
"Mes projets d'avenir," "Tangentenbussole und Galvanometer,"
"Inhaltsangabe von Goethes Götze von Berlichingen,"
"Nachweis der früheren Vergletscherung unseres Landes,"
three geometry exercises and one chemistry exercise.
21 ms. pp. written in 1895-6.
- 3) Two notebooks, containing notes on Prof. Heinrich Weber's physics
lectures at the Eidgenössische Technische Hochschule (ETH),
175 ms. pp. written between 1896-1900.
- 4) Eight letters from Einstein, written between 1895 and 1899, comprising
21 ms. pp.; and excerpts from two other letters which exist only
in a transcription by Maja Einstein (his sister), 2 pp.
- 5) A verse written for the album of Anneli Schmid, 1 ms. p. written in 1899.
In addition there are:
 - 6) Two letters from Marie Winteler to Einstein, 8 ms. pp. written in 1896.
 - 7) Three letters from Hermann and Pauline Einstein (his parents) to the
Winteler family, 7 ms. pp. written in 1895.
 - 8) Documents relating to Einstein's life, such as

A copy of his birth certificate, March 15, 1879

Release from German citizenship, Jan.28, 1896

Personalakte, Aargau Kantonschule, including excerpts from
records of teachers' conferences, grades, etc., 1895-6

Graduation Certificate, Aargau Kantonschule, Oct.3, 1896

Grades and excerpts from minutes of teachers' conferences,
ETH, 1898-1900

Graduation Certificate, ETH, August 2, 1900

Grant of Permission from Swiss Confederation for Einstein to
become a citizen of Zürich, March 8, 1900

Declaration of Hermann Einstein agreeing to his son becoming
a Swiss citizen, July 4, 1900.

A search of the records of the Luitpold Gymnasium in Munich, the Aargau Kantonschule and the ETH may turn up further school records; and a search of the Swiss Federal and Zürich Cantonal records may turn up further documents relating to Einstein's Swiss citizenship. But the number of such documents is not expected to be large, if any are uncovered. These searches will be initiated in 1982.

Transcription of these documents is well under way, and should be completed by mid-1982. Annotation has started and should be finished by mid-1983. Thus, it is expected that this volume will be ready for publication by the end of 1983.

The Swiss Years

As discussed above, it is planned to publish the material from the Swiss Years (1900-1914) in two series: the first will include Einstein's published and unpublished papers, and his notebooks (all scientific) from this period; the second will include his correspondence and other documents about his life and career.

First Series

The published material includes sixty papers (a list of which is appended) comprising about 700 printed pages in their original journal form. Related manuscripts are known to exist for only two of these:

A photocopy of a manuscript entitled "Zum Relativitäts-problem" is in the Jewish National and University Library, Jerusalem. It is the manuscript of an article "Zum Relativitäts-problem," published in Scientia in 1914. The text of the manuscript will be compared with the published paper and significant corrections, deletions, additions, etc. will be noted.

A 4 pp. manuscript entitled "Eine Methode zur statistischen Verwertung von Beobachtungen scheinbar unregelmässig quasiperiodisch verlaufender Vorgänge" is in the Einstein Archive. Its contents are related to that of the paper "Méthode pour la détermination des valeurs statistiques d'observations concernant des grandeurs soumises a des fluctuations irrégulières," published in Archives des sciences physiques et naturelles in 1914. But it is sufficiently different to warrant inclusion in its entirety.

The first printed versions of the texts of the published papers will be used as the bases for our texts, with typographical and other errors noted. Headnotes and footnotes will be included in those cases where it is felt that additional information will be helpful to the reader, especially cross-references to relevant items in the Correspondence. As a sample, an annotated version of Einstein's first paper "Folgerungen aus den Capillaritätserscheinungen" is appended.

One major unpublished manuscript which may be from the pre-Berlin period is known to exist. This is a 73 pp. ms., written as a review article on the special theory of relativity for Marx's Handbuch der Radiologie before the First World War.¹ This item is in private hands, and efforts to secure a copy are continuing. If they are successful, and if it appears that the manuscript was indeed written before the move to Berlin, it will be published in its entirety in the appropriate volume of the Swiss Years.

In addition to these papers, published material includes:

Reviews of 19 journal articles and four books (notably a long review of the first edition of Planck's Vorlesungen über die Theorie der Wärmestrahlung) published in the Beiblätter zu den Annalen der Physik between 1904 and 1907, in all comprising about 20 printed pages in the journal.

Printed versions of comments by Einstein on the discussion of papers by others at the Salzburg Naturforscherversammlung in 1909, the Karlsruhe Naturforscherversammlung in 1911, as printed in the Physikalische Zeit-

¹It is described in Auction Catalogue 191 of Hauswedell & Nolte, Hamburg, which reproduces one page in facsimile and includes a table of contents.

schrift; and at the First Solvay Congress in 1911, as printed in the proceedings of that Congress. These together comprise about 25 printed pages. Autograph texts of Einstein's comments at the Solvay Congress have been discovered in the Library of the French Académie des Sciences. These will be compared with the printed proceedings of the Congress (which appeared in both French and German) and any significant differences noted.

Other manuscripts now known but unpublished during Einstein's lifetime include:

"Antwort auf Planck's MS," a 4 pp. ms. in Mileva Einstein's hand from about 1910.

"Bemerkungen über eine fundamentale Schwierigkeit in der theoretischen Physik," a 2pp. ms written for the Darmstädter Manuscript Collection of the Prussian State Library, dated January 2, 1911.

Five of Einstein's notebooks, consisting of lecture and research notes, and one pocket notebook, with research notes and miscellaneous notations, have been preserved from the Zürich and Prague years (1909-1913). They include about 400 ms. pp., much of it consisting of carefully prepared notes for Einstein's university lectures on such topics as mechanics, electricity and magnetism and kinetic theory. But a good part of it consists of research notes on such topics as statistical mechanics, quantum theory and general relativity; some of these notes are related to published papers by Einstein. These notebooks will be published in full.

In addition to this material by Einstein, there exists a set of seven notebooks in Walter Daellenbach's hand; they consist of notes he

took while attending all the courses given by Einstein during the time he was teaching at the ETH (1912-14). With the partial support of the Einstein project, most of one of these notebooks (Heft 5) was transcribed by Drs. Gorgé and O. Hänni, with the help of Dr. Daellenbach. A small number of copies of the transcription has been made, entitled:

"Statistische Mechanik Prof. Einstein <Vorlesungsnachschrift von>
Walter Daellenbach <Sommersemester 1913 <2>-Stuendig>."

The entire set of notebooks consists of about 1000 ms. pp., including some sections in shorthand (Stolze-Schrey system). The transcribed section of Heft 5 consists of about 50 pp. of typed material resulting from about 100 pp. of ms; which suggests that the notebooks will result in about 500 typed pages when transcribed. Thus, they will require a separate volume of the Papers.

Including the Daellenbach notebooks, the material listed above should fill three or four volumes of the Papers. Since the manuscripts and notebooks all come from the latter part of the period, work on the first volume (or two) will involve only the annotation of printed papers. Some of the papers have already been extensively studied by physicists and historians of science, and their annotation should be relatively simple. Others, for example Einstein's first two papers, have been little studied and will require a good deal more work. Assuming that the permanent staff can be hired by the end of 1982, it is expected that the first volume of this section of the Papers can be ready for publication early 1984, the second by early 1985 and the third by early 1986.

Swiss Years

Second Series

The second series of papers from the Swiss Years, consisting of correspondence and other documents, will include the following material already in hand:

Correspondence: over 200 letters from Einstein and over 100 to Einstein; about a dozen letters from other family members to third persons; and about a half-dozen third party letters about Einstein.

Documents about Einstein's life and career:

Swiss Military Service Book, first entry dated March 13, 1901

Marriage Certificate and printed wedding announcement of his wedding to Mileva Maric, dated January 6, 1903

Advertisement of vacant post in Swiss Patent Office, from

Schweizerisches Bundesblatt, Dec.11, 1901

Request by Dean of Philosophical Faculty (Mathematical-scientific Section) of the University of Zürich for a vote on Einstein's doctorate, July 24, 1905; verso includes records of a favorable vote; opinions favorable to granting doctorate by Profs.

Kleiner and Burkhardt enclosed.

Doctor's Diploma, University of Zürich, granted January 15, 1906

Recommendation from the Dean of the Philosophical

Faculty, II Section, University of Zürich to the Cantonal

Education Department, Zürich for creation of Chair of

Theoretical Physics at the University and appointment of

Einstein to the Chair, March 4, 1909, 11 pp. ms.

Appointment of Einstein as Professor of Theoretical Physics
at University of Zürich, May 7, 1909

Einstein's Honorary Doctorate from the University of Geneva,
July 27, 1909 (several documents)

Appointment of Einstein as Professor of Theoretical Physics
at the ETH, January 30, 1912

Draft letter recommending Einstein's appointment to the
Prussian Academy of Sciences, Berlin, signed by Planck,
Nernst, Rubens, and Warburg, c. June, 1913.

In addition to these documents, the originals or photocopies of
which are in the Einstein Archive, a number of letters and other documents
bearing on Einstein's appointments to the German University in Prague,
the ETH, and the Prussian Academy of Sciences have been published. An
attempt to obtain photocopies of the originals of these documents will
be made.

Only one of Einstein's patent opinions has been available so far,
dated December 11, 1907. It is quite likely that a search of the Swiss
Patent Office records will yield a large number of these opinions and
other documents bearing on Einstein's activities at the Patent Office
between 1902 and 1909. Depending on the number found, and their interest,
all of them or a representative sample will be included in the Papers.

It is hoped that the search for additional documents described
elsewhere in the proposal will yield a substantial number of documents
bearing on Einstein's academic activities as well. It is less
likely that a substantial number of additional letters from this
early period will be uncovered, but it is possible (a small number of
such early letters, as well as many later ones were recently found
in the Brandeis University Library, for example). Depending on the

amount of additional material uncovered, the correspondence and other documents from the Swiss Years will fill one or two volumes. Since a complete search should be conducted before these volumes are issued, and since extensive editorial annotation of the letters and documents will often be needed, it is not anticipated that the first volume of this series will be ready before 1985, at the earliest. Letters and documents will be arranged in chronological order, and a chronology of Einstein's life will also be included in the volumes of this series. In addition to indices for each volume of the Swiss Years, a cumulative index of all earlier volumes of the Papers will be included in the final volume of the Swiss Years.

Search for Additional Documents

Although a large amount of material has been added to the Einstein Archive in the quarter of a century since Einstein's death, it is evident from the number of documents still being discovered that a substantial number remain to be added. In addition to continuing efforts to secure copies of documents known to exist but so far not in the Archive, a systematic search of archives and libraries in this country and abroad to uncover new documents is planned.

The major effort in this search has been delayed, pending availability of an inventory of the material found by the Berkeley project on "Sources for the History of Twentieth-Century Physics", directed by Dr. Bruce Wheaton. Since he has undertaken a major search of European and American repositories, uncovering about 750,000 letters to or from about 5500 physicists, it would seem pointless to undertake a broadcast inquiry now when more specific requests can be made once the inventory is available. Dr. Wheaton now estimates that it will be available in the fall of 1982. However, pending its availability, certain parts of our search can begin. For example, a search of the archives of the Swiss Patent Office for Einstein's patent opinions and other documents relating to his career at the Patent Office should be carried out. This part of the search will initially concentrate on places likely to have documents relevant to the early period of Einstein's life (i.e., 1879-1914) in accordance with the basically chronological plan of publication (see Section on Plan of the Edition).

In addition to the Patent Office, these include the Luitpold Gymnasium in Munich, the Aargau Cantonal School, the ETH (the Swiss Polytechnic University), and the Universities of Zürich and Prague. The documentary inventory already published for DDR Archives lists a number of documents relevant to the negotiations for Einstein's move to Berlin which we will attempt to secure.¹

A number of archives known to have significant holdings of Einstein documents already have been or soon will be contacted, and efforts made to ensure that copies of all documents not already in the Einstein Archive are obtained. In some cases, visits to archives with very extensive holdings will be necessary.

All leads suggested by the Berkeley "Sources" inventory will be followed up by mail inquiry, and visits, if necessary. In addition, major auction and dealer catalogues will be regularly followed to locate and obtain copies of new items as they come on the market, as well as tracing those that have come on the market since Einstein manuscripts became collectors' items.

Finally, a broadcast request for information on relevant holdings will be sent to all major libraries, archives, etc., which have not otherwise been contacted. Advertisements or notices requesting information on privately-held items of interest will be inserted in a number of scholarly journals, professional society newsletters, and newspapers. Several new documents were obtained as a result of such a notice inserted in Nature a few years ago.

¹C. Kirsten and H.-J. Treder (eds.), Albert Einstein in Berlin 1913-1933 Teil II Spezialinventar (Akademie-Verlag Berlin, 1979).

Word Processing Requirements

A recent report to the NHPRC has emphasized the importance of incorporating modern technological developments, such as computers and word processors, into the editorial work of large-scale editing projects in order to effect substantial savings of time and money. The Control Index to the Einstein Archive was prepared in computerized form, enabling rapid extraction of chronological and alphabetical listings. The Princeton University Press has already adopted a computerized typesetting system. Thus, it seems advisable to do as much of the editorial work as the present state of the art allows, as well as many other office housekeeping jobs, using word processing equipment. The optimal goal we have set is to prepare final copy for the volumes in the form of magnetic tapes which are compatible with the Press' typesetting system.

Our project presents several unique problems when compared with such projects as the Jefferson papers, which have already converted to word processing equipment. While the large majority of the documents to be published are in German (particularly in the early volumes), there will be some in other languages such as French, Spanish, Italian, and English. The editorial apparatus, on the other hand, will be entirely in English. Thus, we need a system that can handle all of these languages simultaneously, including the ability to print them out. An even greater problem is the need to store and print a large number of unusual mathematical and physical symbols, and to easily format them in equations and other mathematical expressions.

Not only should the equipment we get be capable of meeting these needs, but (unless we were to get a computer with a memory capable of storing the information in all of the volumes) it must be readily compatible with some available main-frame computer, which will be used for storage and processing of larger batches of information.

We have been studying these problems with the help of the Princeton University Computer Center. It appears at the moment no existing system meets all of our optimal requirements (a detailed list is appended). We have decided to accumulate some further experience in transcribing and annotating documents, in order to get a feeling for priorities, before making what will almost surely be an irrevocable decision (given the mutual incompatibility of most word processing systems) as to what requirements can be sacrificed in choosing a system.

Once we have chosen a reasonably satisfactory system, it is expected that it can be used for transcription of documents, editing of texts, including annotation, and indexing. We shall then be able to operate with minimal secretarial help as well, since most normal office procedures, such as handling correspondence, preparation of reports, arrangement of lists, etc., can be done with the help of a word processor.

Living Co-Workers of Einstein

Before the editorial copy of the Einstein Archives was placed under seal, a number of living correspondents of Einstein were contacted and comments on their correspondence secured. This work will now be resumed. In particular, the living co-workers of Einstein have not yet been interviewed. This group includes Drs. Valentine Bargmann, Peter Bergmann, Banesh Hoffmann, Bruria Kaufman and Ernst Straus. Even though their contacts with Einstein occurred at a much later date than the period covered in the initial phase of publication, it is advisable, in view of their age and the importance of the material, to get comments on their correspondence and published papers as soon as possible. As much of this contact as possible will be done by mail, but in some cases personal interviews may also prove useful.

Princeton University Press

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Einstein Project

February 4, 1982

To: Editorial Advisory Board, Einstein Papers
From: John Stachel

As mentioned in my recent Annual Report for 1981, we are planning to apply soon to the National Science Foundation for a grant to help support the editorial work on the Einstein Papers for the next five years. Enclosed is a draft of the grant proposal. (Note that it does not include copies of the documents which will be appended to the final version). I shall be very grateful for any comments on this version, and/or additional suggestions for the final text. It will be most helpful if I can have your comments within the next two weeks, by mail or telephone: (609) 452-5407.

With thanks in advance, and best wishes,

yours,



John Stachel



DRAFT - Not for Quotation
GRANT PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

This proposal is a request for financial assistance from the National Science Foundation over the next five years for partial support of the editorial work on the first series of volumes of the Collected Papers of Albert Einstein (hereafter denoted "Papers"). This first series will cover the period from Einstein's birth in 1879 up to his move to Berlin in April, 1914.

History and Governance of the Project

In 1971 the Trustees of the Einstein Estate (hereafter "Estate") and the Princeton University Press (hereafter "Press") entered into an agreement jointly to sponsor the preparation of the Papers for publication by the Press. They envisaged a complete, letterpress edition of the works of Albert Einstein, published and unpublished, including his correspondence, as well as such other documents and editorial material as were deemed important for the understanding of these writings. It is estimated that the Papers will comprise twenty or more volumes.

An Editorial Advisory Board was established, with members appointed jointly by the Estate and the Press, to assist in assuring the scholarly quality of the edition. This Board has already been consulted on such questions as the appointment of an editor and the general plan of the edition, and will continue to be consulted on matters of general policy.

In June 1976 Dr. John Stachel was appointed Editor of the Papers, and started work in January 1977. Differences that soon arose between the Estate and the Press over how to proceed impeded work on

editing the Papers for some time. Pending resolution of these differences, Dr. Stachel prepared a complete duplicate of the Einstein Archive for use in the editorial work, and a Control Index to the 43,000 documents in the Archive. A second duplicate of the Archive was made and placed in Seeley G. Mudd Library on the campus of Princeton University, together with a copy of the Control Index, for the use of scholars. A Guide to the Duplicate Archive was also prepared (Copy appended). This work was supported by grants from the NSF and the Sloan Foundation.

The issues between Estate and Press were brought to arbitration in 1979. The Arbitrator found in favor of the Press position, and confirmed Dr. Stachel in his position as sole Editor (Copy of the Decision appended). This decision was upheld in the courts of New York State, final action being taken by the Court of Appeals in 1981.

As directed in the Arbitrator's decision, Dr. Stachel signed a Contract with the Press in September 1981 setting forth the terms of the editorship (Copy of Contract appended). The Estate has declined to sign this Contract. Editorial offices (hereafter "Einstein Office") were temporarily set up in the Press Building, pending the availability of sufficient office space at the Institute for Advanced Study (hereafter "Institute"), and negotiation of suitable, detailed cooperative arrangements between the Press and the Institute.

The editorial copy of the Einstein Archive has been placed in the Einstein Office. Pending the securing of sufficient funding for the appointment of a permanent staff, Dr. Robert Schulmann, an historian specializing in German history who had previously worked on the Steuben papers, has been appointed to the temporary position of Staff Historian

(vita appended): and Mrs. Olga Griminger has been appointed a part-time Editorial Assistant (vita appended). Both are completely bilingual in German and English. Work has started on the transcription and annotation of texts for the early volumes of the Papers.

As noted above, the Editorial Advisory Board will continue to function in a general advisory capacity (Current membership list appended). In addition, the Editor is mandated by his Contract to appoint a small Editorial Committee to work closely with him on formulation of detailed editorial policy and to provide expert advice in various fields. In addition to the Editor, the permanent staff will include several Associate or Assistant Editors, and Editorial Assistants; the exact title will depend on the experience and the level of seniority of each individual chosen. (For a more detailed discussion see the Sections on the Editorial Committee and the Permanent Staff).

Once it has been set up, this editorial structure will function with the guarantees of normal editorial freedom provided by the Editor's Contract. Supervision of the editorial work of the permanent staff will be exercised by the Editorial Committee; the Estate and Press with the advice of the Editorial Advisory Board; and the Institute (should current plans be carried out).

Currently, the editorial work is receiving funding from two sources. Mr. Harold McGraw has donated one million dollars to the Press, the income from which serves to endow the Editorship. The Sloan Foundation has also given a series of short-term grants over the last four years, the latest of which is for \$120,000 to cover the period from May 1, 1981 until June 30, 1982.

The Editorial Committee

The Editorial Committee will consist of a small group of people (about half a dozen) with expert knowledge in areas of particular importance to the editorial work. Its function will be to provide a forum for detailed collective discussion of editorial plans with the permanent staff, as well as a resource for individual consultation on particular problems arising in the course of the editorial work. It is anticipated that its composition will change as the work proceeds from one phase to another. For example, it seems important at an early stage of the work to have regular advice on general editorial policy questions from someone with a great deal of editorial experience on some historical editing project; such advice will be needed less often once the details of editorial policy have been set. On the other hand, when the editorial work reaches the period when Einstein started to speak out and correspond on political and social issues, expert advice will be needed from historians familiar with the Weimar period, the pacifist movement, the Zionist movement, the New Deal period, etc.; but such advice will rarely if ever be needed for the period before the First World War.

For the period covered by this grant proposal, the Committee should include experts in the following areas:

- editorial work on a major historical editing project;
- history of science, especially late nineteenth and early twentieth-century physics;
- theoretical physics, especially statistical physics, relativity theory and quantum theory;

philosophy of science, especially philosophy of physics
and the early positivist movement.

Persons with expertise in one or more of these areas who have also
done work on Einstein will be especially desirable, of course.

To give an idea of the caliber of people desired, the following
names might be mentioned:

Editors: Nathan Reingold, Arthur Link, Mary Jo Kline,

Historians of Science: Russell McCormmach, Paul Forman, Martin Klein,
Gerald Holton,

Physicists: Peter Bergmann, Abraham Pais, Valentine Bargmann,

Philosophers of Science: Adolf Grünbaum, Robert S. Cohen, Carl Hempel.

It is planned to convene the Committee as a whole several
times in the early stages of the work, and thereafter at least once a
year. Consultations with individual members would take place by tele-
phone or mail; or by visits when necessary.

Permanent staff

It is planned to assemble a permanent staff which will include the Editor, three Assistant or Associate Editors (title to depend on level of experience and seniority of the individual), and one or two Editorial Assistants (who would not be expected to have an advanced academic degree). In a small group like this, any "table of organization" cannot be too rigidly applied in the selection of personnel. The actual work done by each individual will depend on his or her particular skills and other strengths and weaknesses, and will also change with the changing requirements of the project. Thus, the following descriptions should not be interpreted as an immutable blueprint, but rather as an indication of the range of skills that we hope to have represented on the staff, and the range of functions to be performed by this staff.

Editor: overall leadership of the entire project, and ultimate responsibility for all decisions. Major background in special and general relativity theory; good knowledge of quantum theory, and philosophical problems of modern physics. Primary responsibility for editorial annotation in physics. Aid in transcription of handwritten documents.

Associate Editor: will assume a major share of the executive responsibility. Major background in the history of science, primarily late nineteenth and twentieth-century physics. Primary responsibility for editorial annotations bearing on history of science. Aid in transcription of handwritten documents.

Assistant Editor: major background in general history, primarily late nineteenth and twentieth-century German history. Some experience on a large historical editing project desirable. Primary responsibility for general historical annotation, the search for new documents, and transcription of handwritten documents.

Assistant Editor: major background in philosophy of science, particularly in late nineteenth and twentieth century philosophy of physics. Some background in statistical physics also desirable. Primary responsibility for editorial annotations bearing on philosophy of science. Aid in transcription of handwritten documents.

Editorial Assistants: management of Einstein Office, including secretarial duties; primary responsibility for word processing and computer work. Major share in transcription of handwritten documents. Primary responsibility for preparation of indices.

All of the staff members should have at least a passive knowledge of German, and bilingual fluency is desirable. Some knowledge of French, Spanish or Italian is also useful.

Plan of the Edition

The aim of this edition of the Einstein Papers is to document fully Einstein's thought and activities as they emerge from his writings and correspondence. The edition will include all available published articles, unpublished manuscripts, notebooks and letters by Einstein; as well as all important letters to him that have been preserved. Third party documents which shed significant light upon his activities will also be included. This edition is aimed at a scholarly audience, but one drawn from a wide variety of fields. Although Einstein's creative work was primarily in the area of physics, his writings and activities had a far-reaching impact in such other fields as philosophy, politics, education, and Jewish affairs, to name only few. Physicists, historians and philosophers of science, psychologists interested in the creative process, and historians of the Zionist and pacifist movements are some likely users of the Papers. It will also provide materials for a full, scholarly biography of Einstein. An edition of the documents in their original languages, including all significant textual variations, will best meet the needs of such readers. Sufficient annotation to facilitate reading of the texts by such a scholarly audience will be provided.

In keeping with the aim and intended audience of this edition, as well as recent practice in editing the papers of major historical figures, the documents will be organized chronologically. To facilitate use of the material, it will be issued in two parallel series: The first series will include Einstein's published articles,

unpublished manuscripts and notebooks. The second series will include his correspondence as well as third party letters and documents of significant bearing on his career and public activities. Apart from a single volume of juvenilia, each series will appear in separate volumes. However, all material from the same chronological period will be edited together so that volumes from both series can be cross-referenced and issued in parallel. It has been suggested that the first series be further subdivided into separate volumes of scientific and non-scientific papers. There are significant arguments for and against such a subdivision. Since there are no non-scientific articles or manuscripts by Einstein preserved from the period covered by this proposal (1879-1914) - nor is there any reason to think that any will be uncovered - it seems prudent to postpone a decision on this question until the permanent staff and Editorial Committee have discussed it.

Given the basically chronological plan of organization of the Einstein Papers, it is convenient for editorial purposes to subdivide the chronology into several periods. Any such subdivision will always be somewhat arbitrary, and the editorial work will basically be a continuous process. However, a consideration of Einstein's career suggests a fairly clear subdivision into four broad periods:

- I The Student Years (1879-1900)
- II The Swiss Years (1900-1914)
- III The Berlin Years (1914-1933)
- IV The Princeton Years (1933-1955)

It may later prove advantageous to further subdivide the last two periods because of the large amount of material preserved from the Berlin and Princeton years.

This proposal covers editorial work on the first two periods. The editing of the material from these periods is discussed in the Sections on The Student Years and The Swiss Years.

Editorial Method

Since Julian Boyd's pioneering work on the Jefferson papers, historical editing projects have developed a number of editorial methods to cope with their particular needs.¹ The aim is to present original texts with as little editorial encumbrance as possible and with an eye to explanation rather than interpretation.

In the present phase of transcription, prior to selection of a word-processing system, and before we have the input of the permanent staff and Editorial Committee on editorial method, we have adopted a literal method of transcription, with a few exceptions: interlineations are brought down the line, the first word in a sentence is always capitalized and the last word followed by a period, no matter what the writer does. To facilitate conversion to the final transcription style, we are noting slips of the pen, expanding abbreviations, and indicating points in need of annotation at the foot of the transcripts. Copies of several sample pages of manuscript together with transcription are appended.

In preparing the texts for publication we plan to use an expanded method. This will involve expanding non-standard abbreviations, and silently correcting trivial slips of the pen. Uncertain items in the text will be indicated. We will develop a style sheet, listing all our conventions, during the coming year.

¹Frank Freidel (ed.), Harvard Guide to American History, Rev. Ed., I, pp. 27-36 (The Belknap Press of Harvard U. Press, 1974).

Annotation of documents will include general introductory material, as well as headnotes and footnotes for individual documents where needed. Headnotes will provide additional information about the document. Footnotes will comment on names, places and other obscure points in the text, explain problems in transcription, and give bibliographical references. In addition, there will be a general introduction to the edition, including a discussion of editorial method, as well as introductory material for the larger subdivisions of the Papers. Chronologies will be included in the volumes of the second (correspondence and document) series. Each volume will contain detailed name and subject indices. Cumulative indices covering all the preceding volumes will be included from time to time.

We have appended an annotated version of Einstein's first published paper and several of his letters, as a sample of the proposed editorial method.

The Student Years

The material from the Student Years (1879-1900) should fit into one volume, barring the highly unlikely discovery of a large number of new documents from this period.

The known documents include the following items by Einstein:

- 1) "Über die Untersuchung des Aetherzustandes im magnetischen Felde,"
an essay of six ms. pp. written in 1895;
- 2) Essays and Exercises from the Aargau Kantonschule:
"Mes projets d'avenir," "Tangentenbussole und Galvanometer,"
"Inhaltsangabe von Goethes Götz von Berlichingen,"
"Nachweis der früheren Vergletscherung unseres Landes,"
three geometry exercises and one chemistry exercise.
21 ms. pp. written in 1895-6.
- 3) Two notebooks, containing notes on Prof. Heinrich Weber's physics
lectures at the Eidgenössische Technische Hochschule (ETH),
175 ms. pp. written between 1896-1900.
- 4) Eight letters from Einstein, written between 1895 and 1899, comprising
21 ms. pp.; and excerpts from two other letters which exist only
in a transcription by Maja Einstein (his sister), 2 pp.
- 5) A verse written for the album of Anneli Schmid, 1 ms. p. written in 1899.
In addition there are:
 - 6) Two letters from Marie Winteler to Einstein, 8 ms. pp. written in 1896.
 - 7) Three letters from Hermann and Pauline Einstein (his parents) to the
Winteler family, 7 ms. pp. written in 1895.
 - 8) Documents relating to Einstein's life, such as

A copy of his birth certificate, March 15, 1879

Release from German citizenship, Jan.28, 1896

Grades and excerpts from minutes of teachers' conferences,
Aargau Kantonschule, 1895-6

Graduation Certificate, Aargau Kantonschule, Oct.3, 1896

Grades and excerpts from minutes of teachers' conferences,
ETH, 1898-1900

Graduation Certificate, ETH, August 2, 1900

Grant of Permission from Swiss Confederation for Einstein to
become a citizen of Zürich, March 8, 1900

Declaration by Hermann Einstein agreeing to his son becoming
a Swiss citizen, July 4, 1900.

A search of the records of the Luitpold Gymnasium in Munich, the Aargau Kantonschule and the ETH may turn up further school records; and a search of the Swiss Federal and Zürich Cantonal records may turn up further documents relating to Einstein's Swiss citizenship. But the number of such documents is not expected to be large, if any are uncovered. These searches will be initiated in 1982.

Transcription of the above-listed documents is well under way, and should be completed by mid-1982. Annotation has started and should be finished by mid-1983. Thus, it is expected that this volume will be ready for publication by the end of 1983.

The Swiss Years

As discussed above, it is planned to publish the material from the Swiss Years (1900-1914) in two series: the first will include Einstein's published and unpublished papers, and his notebooks (all scientific) from this period; the second will include his correspondence and other documents about his life and career.

First Series

The published material includes sixty papers (a list of which is appended) comprising about 700 printed pages in their original journal form. Related manuscripts are known to exist for only two of these:

A photocopy of a manuscript entitled "Zum Relativitäts-problem" is in the Jewish National and University Library, Jerusalem. It is the manuscript of an article "Zum Relativitäts-problem," published in Scientia in 1914. The text of the manuscript will be compared with the published paper and significant corrections, deletions, additions, etc. will be noted.

A 4 pp. manuscript entitled "Eine Methode zur statistischen Verwertung von Beobachtungen scheinbar unregelmässig quasiperiodisch verlaufender Vorgänge" is in the Einstein Archive. Its contents are related to that of the paper "Méthode pour la détermination des valeurs statistiques d'observations concernant des grandeurs soumises a des fluctuations irrégulières," published in Archives des sciences physiques et naturelles in 1914. But it is sufficiently different to warrant inclusion in its entirety.

The first printed versions of the texts of the published papers will be used as the bases for our texts, with typographical and other errors noted. Headnotes and footnotes will be included in those cases where it is felt that additional information will be helpful to the reader, especially cross-references to relevant items in the Correspondence. As a sample, an annotated version of Einstein's first paper, "Folgerungen aus den Capillaritätserscheinungen", is appended.

One major unpublished manuscript which may be from the pre-Berlin period is known to exist. This is a 73 pp. ms., written as a review article on the special theory of relativity for Marx's Handbuch der Radiologie before the First World War.¹ This item is in private hands, and efforts to secure a copy are continuing. If they are successful, and if it appears that the manuscript was indeed written before the move to Berlin, it will be published in its entirety in the appropriate volume of the Swiss Years.

In addition to these papers, published material includes:

Reviews of 19 journal articles and four books (notably a long review of the first edition of Planck's Vorlesungen über die Theorie der Wärmestrahlung) published in the Beiblätter zu den Annalen der Physik between 1904 and 1907, in all comprising about 20 printed pages in the journal.

Printed versions of comments by Einstein on the discussion of papers by others at the Salzburg Naturforscherversammlung in 1909, the Karlsruhe Naturforscherversammlung in 1911, as printed in the Physikalische Zeit-

¹It is described in Auction Catalogue 191 of Hauswedell & Nolte, Hamburg, which reproduces one page in facsimile and includes a table of contents.

schrift; and at the First Solvay Congress in 1911, as printed in the proceedings of that Congress. These together comprise about 25 printed pages. Autograph texts of Einstein's comments at the Solvay Congress have been discovered in the Library of the French Académie des Sciences. These will be compared with the printed proceedings of the Congress (which appeared in both French and German) and any significant differences noted.

Other manuscripts now known but unpublished during Einstein's lifetime include:

"Antwort auf Planck's MS," a 4 pp. ms. in Mileva Einstein's hand from about 1910.

"Bemerkungen über eine fundamentale Schwierigkeit in der theoretischen Physik," a 2pp. ms. written for the Darmstädter Manuscript Collection of the Prussian State Library, dated January 2, 1911.

Five of Einstein's notebooks, consisting of lecture and research notes, and one pocket notebook, with research notes and miscellaneous notations, have been preserved from the Zürich and Prague years (1909-1913). They include about 400 ms. pp., much of it consisting of carefully prepared notes for Einstein's university lectures on such topics as mechanics, electricity and magnetism and kinetic theory. But a good part of it consists of research notes on such topics as statistical mechanics, quantum theory and general relativity. Some of these notes are related to published papers by Einstein. These notebooks will be published in full.

In addition to this material by Einstein, there exists a set of seven notebooks in Walter Daellenbach's hand; they consist of notes he

took while attending all the courses given by Einstein during the time he was teaching at the ETH (1912-14). With the partial support of the Einstein project, most of one of these notebooks (Heft 5) was transcribed by Drs. V. Gorgé and O. Hänni, with the help of Dr. Daellenbach. A small number of copies of the transcription has been made, entitled:

"Statistische Mechanik Prof. Einstein <Vorlesungsnachschrift von>
Walter Daellenbach <Sommersemester 1913 X 2-Stuendig>."

The entire set of notebooks consists of about 1000 ms. pp., including some sections in shorthand (Stolze-Schrey system). The transcribed section of Heft 5 consists of about 50 pp. of typed material resulting from about 100 pp. of ms; which suggests that the notebooks will result in about 500 typed pages when transcribed. Thus, they will require a separate volume of the Papers.

Including the Daellenbach notebooks, the material listed above should fill three or four volumes of the Papers. Since the manuscripts and notebooks all come from the latter part of the period, work on the first volume (or two) will involve only the annotation of printed papers. Some of the papers have already been extensively studied by physicists and historians of science, and their annotation should be relatively simple. Others, for example Einstein's first two papers, have been little studied and will require a good deal more work. Assuming that the permanent staff can be hired by the end of 1982, it is expected that the first volume of this section of the Papers can be ready for publication early 1984, the second by early 1985 and the third by early 1986.

Swiss Years

Second Series

The second series of papers from the Swiss Years, consisting of correspondence and other documents, will include the following material already in hand:

Correspondence: over 200 letters from Einstein and over 100 to Einstein; about a dozen letters from other family members to third persons; and about a half-dozen third party letters about Einstein.

Documents about Einstein's life and career:

Swiss Military Service Book, first entry dated March 13, 1901

Marriage Certificate and printed wedding announcement of his wedding to Mileva Maric, dated January 6, 1903

Advertisement of vacant post in Swiss Patent Office, from

Schweizerisches Bundesblatt, Dec.11, 1901

Request by Dean of Philosophical Faculty (Mathematical-scientific Section) of the University of Zürich for a vote on Einstein's doctorate, July 24, 1905; verso includes records of a favorable vote; opinions favorable to granting doctorate by Profs. Kleiner and Burkhardt enclosed.

Doctor's Diploma, University of Zürich, granted January 15, 1906

Recommendation from the Dean of the Philosophical Faculty, II Section, University of Zürich to the Cantonal Education Department, Zürich for creation of Chair of Theoretical Physics at the University and appointment of Einstein to the Chair, March 4, 1909, 11 pp. ms.

Appointment of Einstein as Professor of Theoretical Physics
at University of Zürich, May 7, 1909

Einstein's Honorary Doctorate from the University of Geneva,
July 27, 1909 (several documents)

Appointment of Einstein as Professor of Theoretical Physics
at the ETH, January 30, 1912

Draft letter recommending Einstein's appointment to the
Prussian Academy of Sciences, Berlin, signed by Planck,
Nernst, Rubens, and Warburg, c. June, 1913.

In addition to these documents, the originals or photocopies of
which are in the Einstein Archive, a number of letters and other documents
bearing on Einstein's appointments to the German University in Prague,
the ETH, and the Prussian Academy of Sciences have been published. An
attempt to obtain photocopies of the originals of these documents will
be made.

Only one of Einstein's patent opinions has been available so far,
dated December 11, 1907. It is quite likely that a search of the Swiss
Patent Office records will yield a large number of these opinions and
other documents bearing on Einstein's activities at the Patent Office
between 1902 and 1909. Depending on the number found, and their interest,
all of them or a representative sample will be included in the Papers.

It is hoped that the search for additional documents described
elsewhere in the proposal will yield a substantial number of documents
bearing on Einstein's academic activities as well. It is less
likely that a substantial number of additional letters from this
early period will be uncovered, but it is possible (a small number of
such early letters, as well as many later ones were recently found
in the Brandeis University Library, for example). Depending on the

amount of additional material uncovered, the correspondence and other documents from the Swiss Years will fill one or two volumes. Since a complete search should be conducted before these volumes are issued, and since extensive editorial annotation of the letters and documents will often be needed, it is not anticipated that the first volume of this series will be ready before 1985, at the earliest. Letters and documents will be arranged in chronological order, and a chronology of Einstein's life will also be included in the volumes of this series. In addition to indices for each volume of the Swiss Years, a cumulative index of all earlier volumes of the Papers will be included in the final volume of the Swiss Years.

Search for Additional Documents

Although a large amount of material has been added to the Einstein Archive in the quarter of a century since Einstein's death, it is evident from the number of documents still being discovered that a substantial number remain to be found. In addition to continuing efforts to secure copies of documents known to exist but so far not in the Archive, a systematic search of archives and libraries in this country and abroad to uncover new documents is planned.

The major effort in this search has been delayed, pending availability of an inventory of the material found by the Berkeley project on "Sources for the History of Twentieth-Century Physics", directed by Dr. Bruce Wheaton. Since he has undertaken a major search of European and American repositories, uncovering about 750,000 letters to or from about 5500 physicists, it would seem pointless to undertake a broadcast inquiry now when more specific requests can be made once the inventory is available. Dr. Wheaton now estimates that it will be available in the fall of 1982. However, pending its availability, certain parts of our search can begin. For example, a search of the archives of the Swiss Patent Office for Einstein's patent opinions and other documents relating to his career at the Patent Office should be carried out. This part of the search will initially concentrate on places likely to have documents relevant to the early period of Einstein's life (i.e., 1879-1914) in accordance with the basically chronological plan of publication (see Section on Plan of the Edition).

In addition to the Patent Office, these include the Luitpold Gymnasium in Munich, the Aargau Cantonal School, the ETH (the Swiss Polytechnic University), and the Universities of Zürich and Prague. The documentary inventory already published for DDR Archives lists a number of documents relevant to the negotiations for Einstein's move to Berlin which we will attempt to secure.¹

A number of archives known to have significant holdings of Einstein documents already have been or soon will be contacted, and efforts made to ensure that copies of all documents not already in the Einstein Archive are obtained. In some cases, visits to archives with very extensive holdings will be necessary.

All leads suggested by the Berkeley "Sources" inventory will be followed up by mail inquiry, and visits if necessary. In addition, major auction and dealer catalogues will be regularly followed to locate and obtain copies of new items as they come on the market, as well as tracing those that have come on the market since Einstein manuscripts became collectors' items.

Finally, a broadcast request for information on relevant holdings will be sent to all major libraries, archives, etc., which have not otherwise been contacted. Advertisements or notices requesting information on privately-held items of interest will be inserted in a number of scholarly journals, professional society newsletters, and newspapers. Several new documents were obtained as a result of such a notice inserted in Nature a few years ago.

¹C. Kirsten and H.-J. Treder (eds.), Albert Einstein in Berlin 1913-1933 Teil II Spezialinventar (Akademie-Verlag Berlin, 1979).

Word Processing Requirements

A recent report to the NHPRC has emphasized the importance of incorporating modern technological developments, such as computers and word processors, into the editorial work of large-scale editing projects in order to effect substantial savings of time and money.¹ The Control Index to the Einstein Archive was prepared in computerized form, enabling rapid extraction of chronological and alphabetical listings. The Princeton University Press has already adopted a computerized typesetting system. Thus, it seems advisable to do as much of the editorial work as the present state of the art allows, as well as many other office housekeeping jobs, using word processing equipment. The optimal goal we have set is to prepare final copy for the volumes in the form of magnetic tapes which are compatible with the Press' typesetting system.

Our project presents several unique problems when compared with such projects as the Jefferson papers, which are already using word processing equipment. While the large majority of the documents to be published are in German (particularly in the early volumes), there will be some in other languages such as French, Spanish, Italian, and English. Thus, we need a system that can handle all of these languages simultaneously, including the ability to display them as well as print them out. An even

¹ Henry F. Graff and A. Simone Reagor, "Documentary Editing in Crisis: Some Reflections and Recommendations", March 1981.

greater problem is the need to store, display and print a large number of unusual mathematical and physical symbols, and to format them easily in equations and other mathematical expressions.

Not only should the equipment we get be capable of meeting these needs, but (unless we were to invest in a computer with a memory capable of storing the information in all of the volumes) it must be readily compatible with some available main-frame computer, which will be used for storage and processing of larger batches of information.

We have been studying these problems with the help of the Princeton University Computer Center. It appears at the moment no existing system meets all of our optimal requirements (a detailed list is appended). We have decided to accumulate some further experience in transcribing and annotating documents, in order to get a feeling for priorities, before making what will almost surely be an irrevocable decision (given the mutual incompatibility of most word processing systems) as to what requirements can be sacrificed in choosing a system.

Once we have chosen a reasonably satisfactory system, it is expected that it can be used for transcription of documents, editing of texts, including annotation, and indexing. We shall then be able to operate with minimal secretarial help as well, since most normal office procedures, such as handling of correspondence, preparation of reports, arrangement of lists, etc., can be done with the help of a word processor.

Living Co-Workers of Einstein

Before the editorial copy of the Einstein Archives was placed under seal, a number of living correspondents of Einstein were contacted and comments on their correspondence secured. This work will now be resumed. In particular, the living co-workers of Einstein have not yet been interviewed. This group includes Drs. Valentine Bargmann, Peter Bergmann, Banesh Hoffmann, Bruria Kaufman and Ernst Straus. Even though their contacts with Einstein occurred at a much later date than the period covered in the initial phase of publication, it is advisable, in view of their age and the importance of the material, to get comments on their correspondence and published papers as soon as possible. As much of this contact as possible will be done by mail, but in some cases personal interviews may also prove useful.