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Part I.

Howard Burchell and Frits Meijler correspondence, starting with the first letter in 1964.

(Abstracted by H. Blackburn)

June 2, 1964

The first letter follows a visit that Burchell had made to the laboratory of Dirk Durrer in Amsterdam at which time he had met Dr. Meijler and encouraged him in some of the work he was doing on an isolated heart preparation. In a failed public demonstration, the heart didn't function. Meijler, the young investigator, was eternally grateful for Howard having said something on the order of: "We learn most from our failures."

Meijler was anticipating a visit to the Mayo Clinic and had sent Burchell a book on Rembrandt as their correspondence started. It continued for another 40 years, embracing a major period of the development of modern cardiology. This explains why we are looking at these letters and abstracting their essence. The collection, sent to Henry Blackburn by Meijler shortly before his December 2010 death, has about 150 exchanges between them, more from, than to Burchell (Correction: Meijler made a CD of his letters to Burchell, which we have added to the collection and plan to match with those from Burchell) The letters start by their addressing each other, "Dear Dr. Meijler and Dear Dr. Burchell."

The Burchell visit to Holland was followed soon by a Conference on Electronics in Cardiovascular Disease at the Mayo Clinic that Frits Meijler plans to attend, and he is thanking Burchell for his Amsterdam visit and preparing the way for his coming to

Rochester, to stay at the Zumbro Hotel. In early letters they begin a private joke when Frits says, “At least once a week I am thinking about the population of the U.S.A.,” in response to a hand-written question at the end of Howard’s first letter, “What is the population of the U.S. now?” [Burchell often initiated interesting discussions, debates, or simple amusements built around some such arcane issue.]

Burchell to Meijler on August 24, 1964, contains Howard’s typical (excessive?) humility, combined often with subtle flattery of his correspondent: “You may find this [Mayo] symposium at a level below that which you would like because of your advanced knowledge of the topic.”

Meijler to Burchell on September 25th, Meijler writes an enthusiastic thank you letter about his visit, addressed to “Mrs. and Dr. H.B. Burchell.” Frits expresses his own humility by saying, “I do know that you very often, or I should rather say, almost always, do not take me seriously. But still ...” when he goes on to thank Howard for his hospitality and promises a gift of Dutch cheese and Dutch chocolates.

And for the first time their letters involve a technical subject as Frits refers to his visit to Braunwald’s laboratory at NIH where he learned about coupled pacing of the heart, which he thought might be “very fruitful in the treatment of heart failure by means of post extrasystolic potentiation.” For the first time on this visit, Frits learned about the anti-arrhythmic effect of beta blockers, as well as their effectiveness in treating hypertension. And in London, on the way home, with Schillingford, he learned how to use an electromagnetic flowmeter which he looked forward to using in his experiments.

This 1964 exchange is the beginning of their deep pursuit of such scientific issues over a period of four decades.

Burchell to Meijler, on October 12th, Howard acknowledges that coupled pacing of the heart “does appear to be an exciting advance, and it may have more possibility of clinical application than I had first thought.” [Rather a characteristic positive-yet-reserved, modest remark by Howard.]

Burchell to Meijler Oct 27:

The correspondence immediately becomes frequent and elevated. In Howard’s thanks for the cheese and chocolate in a letter of October 27th, he combines one personal sentence on the chocolates with a new question of whether Frits might begin to use his new-found “coupled stimulation for persons with uncontrolled tachycardias.” So they are already off to the races on issues: improving cardiac function by controlling heart rhythms to potentiate output.

Meijler to Burchell: on December 10, 1964, Meijler quickly takes up these ideas and starts exploring them in correspondence with colleagues in Europe on the augmenting effect of paired stimulation on myocardial contractility in certain types of tachycardia and in certain types of heart failure. And he gives credit to Eugene Braunwald who, “had the courage and vision to introduce this type of rhythm in clinical cardiology.”

The vigorous exchange of technical correspondence corresponds with familiar greetings to wives and children for the holidays.

Meijler to Burchell in June, '65, Frits is proposing more visits to Rochester and says he hopes “you will allow us to visit you again.” Then fearing he is being too familiar, he

comments, "You may get tired of all these visitors from abroad, especially from Holland, so do not hesitate to let me know if my planned visit does not suit you."

Burchell to Meijler on June 28, '67, Howard Burchell, still in Rochester, is now editor of the journal, *Circulation*, and writes a pre-congratulatory note to Frits who had just accepted the chair of Medicine at Utrecht. They continue their discussion of children in which Frits is looking for a summer music school in Europe for one of Burchell's daughters. [That would probably have been Becky who plays the cello.]

Meijler to Burchell on July 27, '67, Frits writes, still addressed to "Doctor" Burchell, that he has accepted the chair, and how difficult it will be to separate himself from Durrer and his laboratory, and he opines, "I do not know whether or not I have made the right decision to accept the Utrecht offer. However, all my advisors have told me to accept the chair and to face the challenge of bearing my own responsibility."

He hopes that Burchell will allow him to ask questions about the problems of being a department head as time goes on. He offers to open his home to Howard and his children at any time.

By November 8, '67, they are having correspondence about possibly shipping a Dutch golden retriever to Howard at a cost of \$50 for the freight.

Burchell to Meijler, November 15, '67, We have the overwhelming news that Howard Burchell is leaving the Mayo Graduate School to come to head cardiology at the Medical School in Minneapolis, starting January 1, 1968. He also will move his editorial office of *Circulation* and appends a hand-written note in his small hand in red ink asking Frits, in regard to his big move: "What do you think of this?"

Meijler to Burchell, November 28th, Frits writes back that he was stunned to learn Howard was leaving the Mayo Clinic, saying: “The Mayos without you will be like Amsterdam without canals.”

Burchell to Meijler on December 8, 1967 a letter to Frits is a typically arcane remark by Howard: “It is going to be very difficult for me to leave both the Clinic and Rochester, but, although it may sound naïve to say so, I thought it my duty to try the Medical School job when it was offered (and re-offered) to me.” He gives no idea why he felt that was “a duty.” [Howard once made the off-hand remark to me, when I asked him why he made the move, that “Mayo doesn’t have a very good retirement program,” as if his livelihood depended on the move. I did not take this seriously.]

Burchell to Meijler on January 3, 1968, Howard acknowledges that a confidential letter from Frits, the contents of which we don’t know about, had distressed him, hearing that things were not going smoothly with Frits. He indicated that he had no satisfactory answers for the questions raised, but hoped that he might come up with some after a short period, and explains that he is in the midst of the move to Minneapolis.

Finally, Howard expresses his own questions and concerns about his moving decision: “As yet the cardiological group at the University of Minnesota is not separated from the overall operations of Department of Medicine, and I am a little uncertain as to how much authority I shall have as head of the cardiological group in the Heart Hospital.”

Howard appends a personal, hand-written postscript: “Your confidences will be respected and I shall write you in long-hand about specific questions,” this in reference to Fritz’s problems he had written about earlier.

Meijler to Burchell on June 21, 1968, Frits was enthusiastically involved with his new job.

"I must confess that I don't find the time to annoy myself although I may annoy others. My new job indeed has given me a lot more responsibility and work. Though strange it may be, I do like it. Of course, I can't say anything about the results yet."

He promises a series of hemodynamic studies on patients with atrial fibrillation. And then he speaks for his wife and himself about their sadness at the assassination of Senator Robert Kennedy and says, "Although the recent murders may affect America's prestige; you should remember that you still have many good friends in this country."

It's now June, 1969, and it's still, Dear Frits and Dear Dr. Burchell in the exchange. Rather typical of American and European formality, or lack thereof.

By July 31, 1969, Frits, for the first time, addresses Dr. Burchell as "Dear Howard, "and gives him advice on how to dig up, dry, and store tulip bulbs, but also offers to prevent further garden disappointment by sending him a fresh set of Dutch bulbs.

By October 21st, Howard acknowledges to Frits his receipt of the new tulip bulbs and welcomes him to the upcoming American Heart meeting in Dallas. Frits is sorely disappointed that his abstracts have not been accepted for presentation in Dallas, and he sends Howard the reviewer's critique, one which concludes, "I do not like to be harsh in my judgment of this serious-minded piece of work, but nevertheless I feel there is enough lacking in this manuscript to militate against publication in its present form."

About the other abstract, rejected for presentation but being printed, one reviewer says, "I cast a very jaundiced eye on the method of trend comparison which is applied here." "----(14.24) and upon the application of this corrective method, since the equation

given on page 7 indicates that correlation values would very likely be reduced to an r of less than unity almost regardless of what the nature of the trend is." One critique recommended publication with only a second priority because "the results contradict prevalent theories and should stimulate much discussion."

Howard sends reviews back to Frits, as they were submitted to *Circulation*, with a recommendation that they be sent to *Circulation Research* with the comment: "I hope that they will agree that they are objective and have some merit."

[In my experience as his associate editor, Howard Burchell's letters to authors when their articles were refused were gems of encouragement and kindness, as well as factual and objective. His object was always to encourage objectivity, improve the science, and not severely criticize or discourage the investigators.]

Howard writes Frits, on March 9, 1970, as editor of *Circulation*, that Frits's new paper is accepted and will appear in the May issue of *Circulation* and not only that, but he has prepared a short editorial for that issue discussing the conclusions. He writes: "I believe you will think the editorial fair." Howard then mentions that Dirk Durrer had come to Minneapolis and given the George Fahr Lecture (on excitation of the heart) and that it was well-received and would be published in *Circulation*.

Now the relationship between him and Frits is close and there is a rapid exchange. Hardly a month goes by without correspondence. One of the reasons for this is undoubtedly that Frits is working in an area of great interest to Howard and the recent

paper he submitted was on “R-R Intervals Analysis in Patients with Atrial Fibrillation at Rest and During Exercise.”

They get involved in heavy discussions over this paper, particularly since Frits is doing dog experiments with atrial fibrillation and finding that they have the same ventricular response as do people. But this is different from the artificial atrial fibrillation of Moe and Abilskov, Frits explains: “Of course, one needs a sufficient number of fibrillating cells to get an ‘overall’ random nature of the excitation wave-fronts.” He says he’s become fascinated with the problems of atrial and ventricular fibrillation and the effect of RR intervals on myocardial contractivity that he thinks explains the hemodynamics of many people with atrial fibrillation.

Frits indicates that his daughter, Gerda, is going to visit Emily, the daughter of Ed Sonnenblick, the distinguished American cardiovascular investigator. [So apparently Frits is developing close, personal relationships with other American leaders and their families.]

[The *Circulation* stationery heading now in 1970 lists Ray Anderson and Henry Blackburn as associate editors; Patrick Ongle at the Mayo Clinic has been rotated off. The following people with epidemiological studies or expertise were also listed on the Circulation Board, which indicated the evolution of Howard’s thinking about important new areas in cardiology: Gunnar Blomquist, Bob Bruce, Joseph Doyle, Frederick Epstein, Alvan Feinstein, Ed Freis, Richard Gubner, Marc Kjelsberg, Oglesby Paul, Jeremiah Stamler, and John Turner,

There is an artifact of this date, June, 1970; a artful greeting card from Frits to Howard made up of Frits’s cut-outs from newspapers, with such emotional words as

“loving, excellence, admired, editor-in-chief, reliable, euthanasia, busy life, Baron Rothchild, whales and cordless telephones.” On the back of the card is a portrait of Anne Marie and of Frits Meijler keeping a number of balloons in the air with illegible captions, and a picture of a traditional Dutch windmill, which is probably the summer home of Dirk Durrer near Amsterdam. It also shows an electrocardiogram with variable A-V block.

And here’s the wedding announcement of Cynthia, the daughter of the Burchells, to Mr. Richard Patterson.

June 23, 1970 on *Circulation* stationery, Howard responds with a detailed critique of an article submitted informally to him by Frits. with Howard’s typical, ‘on the one hand, and then on the other hand,’ response. “I think it likely that if the paper were submitted to *Circulation* it might be returned with the suggestion that it would be more appropriate for the *Journal of Physiology or Circulation Research*. But, I would be guided by the recommendations by two or more advisors on the Editorial Board.”

Since the submission was informal, he also writes about the lovely tulips that had blossomed in St. Paul in June, the gift from Frits. And they talk about children.

On July 6th, Howard finally recommends that the article be sent to the *American Heart Journal*, which would “be best as a medium to carry the report as presently written.”

July 28th, 1970. Howard is already talking about submission of subsequent articles to the new editor of *Circulation*, Charles Freidberg. [I was at *Circulation* at the time of that difficult transfer, when the whole tactic, mood, and protocol of reviews changed from that of fairness and support and graciousness under the Burchell regime, to one of distance, abruptness, and discouragement under Friedberg, which very much saddened Howard Burchell and shocked us, his associates.

He indicates he's forwarding Frits's work on artificial atrial fibrillation to the new editor and appends a personal note that he "hope he looks favorably upon it."

In January 26, 1971, Frits is writing Howard about cardiac surgery at his university hospital in Utrecht, and the fact that the cardiac surgeon had left precipitately and how he's uncertain that he can refill the position of cardiac surgery and hopes Howard can find an American, pointing out that it's a rather urgent situation for Utrecht.

Howard indicates that he doesn't know anyone who is appropriately trained, who is not already well-established with ongoing programs that they would not want to leave. And he mentions the name of Aldo Castaneda at Minnesota who has recently refused an offer from the Mayo Clinic, and refers Frits to Kirkland, McGoon, Shumway, Glenn and others who lead in cardiac surgery in this country.

In a letter of February 23, 1971, Frits tells more details about the departure of the cardiac surgeon who they had wanted to leave because "his mortality was above acceptable levels," and the fact that the surgeon was "fighting everybody about everything." "Anyway it is better not to have a surgeon than the one we had."

In follow-up on the paper sent to Freidberg, Frits had received a negative form letter that the article was "not suitable for publication in Circulation." On his own, he sent it to Circulation Research where it was accepted without question.

In February 23, 1971. Howard sends a charming photograph of his lovely golden retriever against a wall along which Frits's tulips are in bloom.

In a letter of February 16, 1972, some of the secret concerns in the early correspondence about Frits leaving Amsterdam are now disclosed and had to do with the coolness and the estrangement that Burchell had sensed between Frits and Dirk Durrer at

the time Frits left Amsterdam for Utrecht. Howard writes in February of 1972 that he is happy to hear that this coolness had dissipated. Fritz replies, February 22, 1972, "Indeed, that the old friendship "has been restored at least as far as I am concerned. But I sense that with Dirk it is the same. I am very happy about that because I owe him so much and I like him so very much." (25.41)

A letter of March 9th indicates that Howard had met Paul Hugenholtz who described the opening of Durrer's Institute as a splendid occasion.

In a letter of May 1, 1972, Howard writes of consulting in Edinburgh on three complex cases of pediatric cardiology. [I wasn't aware he would attempt such consultation.] One was idiopathic pulmonary vascular disease with an open ductus. Another was sub-aortic muscular stenosis masquerading as a ventricular septal defect. And another was primary pulmonary hypertension.

For the first time Howard mentions computerized electrocardiography and his difficulty in reviewing a paper eventually published in *Circulation*, in August, 1970. [He went on to be very supportive to Ralph Smith's developing computerized electrocardiography at the Mayo Clinic.]

For the first time on May 29, 1972, Frits speaks of the development of the *European Journal of Cardiology*, for which he has been asked to become Chief Editor. He would like to have Howard, along with Jack Schillingford, on the Advisory Board. There is continued conversation about atrial rhythm during ventricular fibrillation and other esoteric subjects.

They then have an extensive conversation over half a dozen letters about a young boy that Howard had seen in consultation in Holland in 1972 who subsequently died with

very little evidence of anything other than pulmonary embolism. Howard speculates that the initial factor was a viral infection, followed by an “antibody reaction with a destructive process in the heart” and asks whether toxoplasma was tested for and if complement level was determined.

In an undated letter sometime in 1972, Howard suggests experiments, or suggests that Frits study the distribution of R-R intervals in atrial fibrillation in patients who are exercising or are taking isoproterenol or other catecholamine active compounds, and refers to Frits’s finding of a bimodal distribution of RR intervals in atrial fibrillation.

On August 10, 1972, they have a long exchange on the composition and mission of the new *European Heart Journal*. He refers to a gift from Frits of an injected coronary system, in plastic, that he displays proudly in his Minnesota office, which is much admired by his staff. He pens a hand-written postscript about the visit of Dr. Simoons to Henry Blackburn and how Simoons only knew of Dr. Hugenholtz and not much about Frits’s work, which ignorance of colleagues Howard bemoans is typical of people in a large university.

In a letter of August 23, 1972, Frits indicates in a letter to Howard that he is soon to visit Minneapolis and wants him to set up an appointment with me, Blackburn, to discuss electrocardiographic coding and mentions the fact that he sent me a coding system that he had developed. [I am embarrassed to have no recollection of such a system or of that visit. I would assume his system had to do with coding arrhythmias, but I’ll have to look it up.]

In a letter of September 1, 1972, Howard suggests that left axis be defined in terms of spatial vector shifts and wants to discuss that with Frits. He now speaks of sending a monograph on his coding system to Howard.

[I'll have to write Rautaharju whether he knew about a 1972 coding system by Frits Meijler for electrocardiographs. It's very annoying that people should die and you can no longer ask them questions.]

For the first time in November 20, 1972, Frits mentions the Atlantic River term that he used often in correspondence, suggesting that we cross over it to visit.

The 30th of November they exchange a letter on the randomness of distribution R-R intervals and the --(31.04) nature of fibrillation of a cardiogram sent to Frits with only 89 RR intervals. He says that all the short intervals seem be followed by long ones but in reality this is not the case. They are random. And he asks Howard for his paper that I'm not familiar with on, "The relevance of the irrelevant," also indicating that Dirk Durrer "should read it. "

Frits, in February, 1973, thanks Howard for writing the introduction to the first issue of the *European Journal of Cardiology*.

November 30, 1973, Frits is having his colon removed for diverticulosis.

There is a rather mysterious reflection in an August 26, 1974 letter to Frits from Howard about "hearing nothing concerning Nobel decisions this year." "And I judge it this means no rumors as well as no direct information." [I would be guessing that Dirk Durrer had been recommended for nomination.]

Frits writes again in '74 that he wants to meet with Blackburn in September about ECG handling and analysis.

October 5, 1974, Howard writes Frits about resolving his problems with Mike Cudahay concerning the Marquette ECG instrument, and his own negotiations for Abbott

Northwestern and the Mayo Clinic concerning automated electrocardiographic services that Howard hopes would reduce the cost to the patient rather than increase it.

On October 28, 1974, Frits expresses his disdain for computer analysis of the electrocardiogram, projecting that it will take a decade for reliable computer analysis of cardiograms. He proposed a hybrid system, "Mainly a combination of man and machine. I even become excited while writing about it. Although the cost factor of such a system cannot be neglected, the main goal should be the increase of quality of the service rendered to the patient." [Indeed, that combination is what is now largely in place. Machine records are over-read by a cardiologist everywhere.]

Frits makes an interesting aside in his October 24, 1974 letter, saying, "Mr. Cudahay visited Holland on October 8th and he promised me heaven on earth if I may translate freely from the Dutch." Frits says in his opinion, there is no such thing as computer analysis of the ECG--for hospitals.

We should take up next with the letter of October 3, 1975, in which Howard now addresses Frits on Abbott-Northwestern Hospital stationery, having retired from the U. of MN.

Part II.

In the Fall of 1975, there's an exchange of several letters arranging their meeting at the Anaheim American Heart Association general sessions. And Burchell also includes a letter in his correspondence that he directed to the editor of the European Journal of Cardiology on October 23, 1975 in detailed response to reviewers of his article with Naip Tuna on the use of initial vectors of ventricular premature beats in the discrimination of anterior vesicular blocks, in which he argues for the term VPB, rather than VPC, indicating that "Theoretically, one could claim that there could be a premature ventricular beat without a premature ventricular contraction. That is, an electric phenomenon without excitation – contraction coupling."

And in the first grammatical error, or perhaps just a typo, that I've ever caught Howard in, after using "criterion" correctly, he adds a sentence "The criteria for ---axis 1.59 deviation was the presence of the late vectors, and so forth." Shocking in such a scholar.

In a letter of November 5th, Howard looks forward to meeting Frits along with Dr. Pruitt in Anaheim and continues to elaborate his work on extrasystoles and analysis of the first 10 and second ten millisecond vectors to further differentiate multifocal versus unifocal extra beats. A pursuit that I was unaware he was doing.

On December 1st, Frits sends a cordial letter on his academic hospital stationery, enthusiastic about their meeting, and complaining that they hadn't time enough to discuss "all the prevailing problems." For the first time he mentions the Dutch workshop on "Indications for coronary angiography and coronary surgery," to which he invited me, Henry Blackburn, shortly after, and which solidified my friendship with Frits. And Frits now proceeds to seek Howard's counsel on handling editorial problems in his new journal, the European Heart Journal.

On December 9th, Howard answers Frits regretting that he did not visit Disneyland with Fritz and Theo Dirk on their invitation, followed by a typical Burchell understatement. "In retrospect, I think I could have missed the electrophysiological session that day without harm to my knowledge and practice." And he expresses his distress that he was not allowed to participate in the payment of the bill for their dinner together.

Then he expresses his concern for a comment he made in public ("which I hoped that I had carefully and tactfully phrased") had not upset some of their mutual colleagues, including Durrer. And he closes with the regretful comment "Dirk had so much to be proud of that it would be a disaster if minor problems led to embitterment and spoiled Dirk's properly deserved enjoyment of his success."

On December 23, 1975, he indicates that if he comes for a meeting on coronary artery surgery, he will be unable to attend the April European Congress of Cardiology in June, so

that that should be considered in their decision whether he should participate in Frits's conference.

On February 7, 1976, Howard writes a hand-written letter, obviously on a sensitive matter, starting out with his apology that he can't come to the meeting in April despite the fact that "I appreciated and felt honored by the invitation of the Dutch government through Dirk, you and Dr. Hein to participate in a workshop on coronary surgery (I judge----7.08, in participation to the relation to the socioeconomic aspects) on April 9th and 10th. And wishing so much to accept, I discounted previous commitments more than I should have done if I had been realistic." He goes on to say that he would doubt that any of his opinions would conflict in any significant in any significant way with those of people that were coming, including Ross, Swan and Kirklin. He indicates that that problem is being carefully dissected and occupies the attention of many people in the U.S., including the American Heart Association Committee providing guidelines for who should have coronary arteriography.

He ends this letter with personal regards and deep regrets. It is written on Stanford University stationery during the period of his regular winter consult there.

By March 1, 1976, they had met briefly in New Orleans and Frits writes Howard a letter at Stanford. And despite the February letter, he continues to put pressure on Howard to come to the meeting, saying how much he needs his presence at his April workshop in order to "have a sobering and statesmanlike effect on the discussions. And I really think that your presence will make all the difference." He offers to pay for full fares for Howard and

Margaret and a substantial honorarium. And why not use the Easter holidays for this visit to Europe. He obviously failed utterly to understand the seriousness of Howard's hand-written letter saying that he had unavoidable commitments and could not participate.

This letter to Frits from Howard of March 18th in which he indicates that he simply cannot come and "It would not be morally right to break them (commitments in this country)." He expressed the hope and the dream of getting Hein and Dirk together again to heal the rift that something might evolve to help Hein, which would also help Dirk and Dutch cardiology. Apparently the comment on March 29th about isolation refers to Hein rather than Dirk.

They then carry on a conversation in the March 18th letter on automated ECG processing, in which he protests that Frits's attitude that ECG automated data processing is still a research matter. And Howard says, "I do not believe that this is true, as a Mayo enterprise has been integrated into their volume reading system. I think that this could be regarded as part and parcel of their established method and is functioning in a worthwhile manner. This does not say that the system is independent of professional over-reading or (does not) require an improvement in programming." Howard then lists several advantages that Frits should include in his analysis of the computerized ECG, suggesting that there should be "1) developments in respect to a common language, that is terminology; and 2) the need for a probabilistic approach so that the diagnosis can be given with the probability factor as to its likelihood of being correct." Howard suggests that it, automated ECG, could be used not

only in epidemiological studies but also for insurance and health maintenance purposes. "One can look upon the computer read-out (of the ECG) as a laboratory report, and these reports should always be suspect of possible error. When they are in error, it can be of great educational value." In summary he agrees with the assessment in general, but emphasizes the educational value and the integration of automated reading with the record system and the research potential. That is, "the accumulation of a tremendous bank of documented diagnostic categories for comparison and the working out of probabilities that reported diagnoses would be correct; and the search for the simplest and most reliable lead systems and for the standardization in this regard." This is a very strong advocacy for automated electrocardiography, which may or not have convinced Frits.

Howard mentions that he gave a draft of an editorial called "The American Letter" for use in the European Journal of Cardiology and in his typical modest way say, "If the format and content were believed worthwhile to publish, some editing would be of benefit." Indicating that when he gave him the draft he did not regard the essay as finished and sought Frits's reaction in New Orleans rather than his carrying it back as a finished product.

It's March 29th, again from Frits who accepts that he will miss him at the workshop and that he understands why he cannot leave.

They discuss problems between Hein and Dirk indicating that Dirk's "solitude is increasing and he estranges himself increasingly from his coworkers and pupils. I don't know what to

do about it but to remain as close to him as I can. It is not easy.” This sounds like Dirk is having a bitter and depressive reaction after having achieved such great successes.

Frits replies on April 21st to Howard back in Minneapolis. The Hein that they refer to refers to Hein Wellens who Frits announces in this letter of April 21st will become the chair of Cardiology at the medical school in Maastricht. “A good solution for him and the country.”

Frits indicates that he visited Pentti Rataharju in Halifax and the Hewlett Packard Company in Boston, and liked Hewlett Packard’s “realistic approach to automated ECG processing.” He now indicates that “Maybe we can integrate the ECG system of a couple of the university hospitals.”

[So his workshop is over and it was one on coronary disease and not on importing coronary surgery to Netherlands as I had assumed.]

In Howard’s May 4th reply of ’76 he indicates that the Hewlett Packard system was also being put in operation at Stanford. He indicates he had a pleasant and profitable time in Stanford, “though I did not accomplish any task of great moment.”

Frits replies on August 2, 1976, complaining of the long pause in their letters since May. [And they did speak of a copy of the proceedings of the workshop in Arnhem, which is the workshop that I attended. And though he indicates that it’s quite confidential, the report of the proceedings, it is clear that cardiac surgery in the Netherlands “has come into a current acceleration (is that English).” He indicated Dutch patients are now being operated on by

Denton in Houston, while at the same time our government still hesitates about steps to be taken in our own country. He says that he must confess that even if sufficient funds would be available, he doesn't know how to solve the Dutch cardiac surgery problem on short notice. Obviously our Council at Arnhem was insufficient.]

Frits announces that he hopes to spend a sabbatical year with Bob Rushmer and Allen Schur in Seattle starting in '78. He goes on with the saga of Hein Wellens, who had sold his house in Amsterdam and indicates that "Hein does not seek any contact with anybody. He left Amsterdam without calling me or any other friend, and to me it is clear that his bitterness has reached an unbearable level. At the same time, the inadequacy of his present behavior may at least in part explain why Dirk could not get on with him. It is painful to learn how much sorrow people bestow on each other. Especially in a small society like ours, the problems seems larger because we live so close together and do meet each other so often. Anyhow, I'll bet he gets the Maastricht chair and that his life may get some new promise. This leaves us with the problem of how Dirk should manage his many obligations and duties. I'm kind of sad about the whole situation."

Finally the American Journal of Cardiology turned down Frits's editorial on computer electrocardiography and he has changed the paper according to Howard's recommendations and is going to publish it in Proceedings of the Brussels meeting on ECG, which took place after Amsterdam [and which I attended].

He still speculates on who benefits from computer electrocardiography. “As far as I can see not yet cardiology, neither our patients, maybe industry and a number of engineers.” He indicates “You can’t find a clinical cardiologist who shows interest, let alone one who is able to talk about it in a sensible way.”

In Howard’s August 11th reply, he indicates that “Dr. Blackburn gave me an outline of what he thought would be the recommendations of the workshop on coronary disease in Arnhem, and they seem to be possibly influenced more strongly by the surgeons than the medical attendees.” They continue to bemoan the breakdown in the relationship of the Wellen and Durrer. Burchell comments on Dirk’s recent presentation on the History of Cardiology in Holland. [They went on, of course, to produce a publication, Frits and Howard, on Cardiology in The Netherlands.] He speculates that Wellen’s? 21.18 association with Kulbertus might be productive because of their mutual interest in reentry pathways and the anatomic and physiological correlation.

He speaks of an essay by Ray Pruitt on the dipole theory with reference to Craib, Lewis and Wilson, and their work going back to the ‘20s. He closes by speculating on the contractual relationship and cost of a package deal to send a Dutch patient to Denton Cooley (22.10) in Texas for coronary surgery.

In an August 24th note from Howard he closes with a comment that he had just seen a note that Einthoven was very active in the rowing club as a young man at Utrecht and wondered if there was a plaque there to commemorate his presence.

In a November 16, 1976 letter from Abbott Northwestern Hospital to Frits, concerned with the unhappiness of Dirk, "Distressed to learn that Dirk is not finding the happiness that he deserves, nor apparently helping others to find it."

Howard and his knowledge of the Stanford system suggests that Don Harrison might be interested in having Wellens come to Stanford for a sabbatical-type year. He encloses a copy of the American College of Cardiology Conference on "Optimal Electrocardiography" with Abildskov as chairman. The conference was held April 23-24, 1977 with six task forces: Task force 1 on standardization, headed by Surowitz; 2 on quality of records, headed by Tom Sheffield and Henry Blackburn; 3 on computers, headed by Rautaharju and Allen Pryor; 4 use and practice, headed by Leon Resnekov and Sam Fox; 5 on cost effectiveness, headed by Gorge Rios; and 6 area for future study, headed by Douglas Zipes and Madison Spach.

The Journal has announced that the Heart Institute is changing its name in September of '76 from the National Heart and Lung Institute to the National Heart, Lung and Blood Institute, with Robert Levy as the director.

Only a week later on November 23rd, Howard writes Frits again to report on his visit with Dirk Durrer and his family in Miami, expressing his distress that the rift between Dirk and Hein "seemed irreversible." And now it turns out that he's most concerned that his, that is, Howard's, letter to Dirk criticizing the editorial on atrial pathways "seemed to have been a major item precipitating the separation. After so many years of friendship, I thought it

would be stimulating to be provocative and even a little facetious in my letter, but I regret that approach very much now.”

(I am fascinated by this realization because something of a rift developed between Howard Burchell and me a few years ago when after continued criticism that Howard expressed to me about a number of issues, I suggested that he might begin to be considered contrarian. He fretted about this for some time. I let him fret.) He then discusses the editorial, Pruitt’s paper called “Dipoled Doublets, Craib, Wilson, etc.”^{26.44} Suggesting that Durer write the editorial rather than he, Howard, and that if he did write it, “he might wish to mention an item which surfaced in some recent correspondence of ---^{27.00} (Pruitt) namely that Einthoven and Craib had a dinner at which Dr. Andrus was present in Sweden. He found them talking to each other in Dutch.” Craib had South African origins. He comments, “Ray’s scholarly essay might have initiated some controversy regarding who led the original revolt against the negativity hypothesis as taught in the early 1920s. But such thoughts of priority seem to lead to nothing valuable.”

Again right away on December 1, 1976, there is another letter from Howard to Frits in which he is reviewing a paper on angina pectoris in a presumably healthy, middle-aged man and suggests that Frits use Prineas or Stamler as an epidemiologist to review the paper. He also offers another American letter to Frits’s journal entitled “Best 10 Cardiac Reports of 1976.”

Frits replies right away in a long letter on the 3rd of January, ’77, responding to three letters in a row. He quickly protests Howard’s interpretation that Howard’s letter criticizing an

editorial on atrial pathways was a major item in the separation of the two Dutch colleagues [Hein and Durrer] indicating that the rift between them started at a much earlier time with a very bad “structure of their relationship” for a long time--from the very beginning.

“Power and responsibility can never be divided into two equal parts. Hein became increasingly famous outside The Netherlands, and maybe he did not always give Dirk all the credit he deserved. At the same time Dirk has communication problems. He hardly ever shows the behind part of his tongue, that is a Dutch expression, and does not like to play the second violin (who does by the way?). They are both perfect people but it just didn’t work out. If your remark did trigger the separation the bondage for sure was not a very solid one. And I know for a fact that even before this they were hardly on speakable terms. Please don’t blame yourself because that doesn’t make any sense. Life will go on anyway. Hein will most probably get the chair in Maastricht then he will be able to prove that he can accomplish when he has to start from scratch. I will do my best to help him and also go on trying to give Dirk all the friendship and help he may need or want.”

He indicates he has a history of asking Dirk to write editorials--unsuccessfully. For example, he asked him to write one on the relationship between infarct size and STT changes. Dirk’s masterly lecture at the European Congress of Cardiology in Amsterdam will be published in the European Journal of Cardiology in the 1st issue in ’77.

He goes on to describe “The little Dutch world of coronary arteriography and surgery still in turmoil.” He points out that the profession is divided and this enables the government to refrain from coming to a conclusive decision.

He speaks of a Geneva conference sponsored by WHO on ECG classification and refers to D Medina's monograph on optimal electrocardiography. He enthusiastically accepts Howard's proposal for the best 10 cardiac reports for '76 and says this would not only be nice, but we may want to do that every year.

Howard replies on January 12th, in which Howard indicates he will again go to Stanford for the winter, that he has been buried under undergraduate teaching and worries, as usual, about his relevance. "I am uneasy that my brand of electrocardiography is too ethereal and non-dogmatic to be most helpful for medical students." He indicates he continues to work on the initial vector in anteriovesicular block (32.38) and how this might be associated with sub-endocardial infarction. He will also report on the work by I.J. Fox and Bob Bache, on transmural coronary flow. He suggests that his best 10 case reports for the year may contain a little surprise.

This is followed by a January 18th letter right away from Frits with a handwritten letter in February 11th that Hein Wellens has taken the new job in Maastricht and will not come to Stanford.

In March 10th, '77 Frits responds from his hotel room in Las Vegas in which he asks for Howard's critique of an editorial he has just written asking for his speaking his mind and he sends an enlargement of a photograph that Howard had earlier admired.

On March 3rd, Howard sends another editorial for possible use in Fritz's journal, a subject not given.

And on March 16th, Howard writes again from Stanford thanking him for letting him hear his voice from Las Vegas, expressing happiness that he took time off to visit the Hoover Dam, and an editorial that had to do with the best case reports for 1976.

There's a picture of the rainbow over the Dutch waterways.

He comments on Frits's paper on three dimensional animation of the spread of excitation in the human heart. He describes how he had discussed with John Lilley, a biophysicist, the equipment need to make such a model with myriad small lights connected through amplifiers on the heart surface and the single flash one would record it on ---35.11 to replay at slow speeds. The cost being completely out of line with the value. He expressed pleasure at being quoted in an editorial of Frits's on the relevance of irrelevant research and suggests tactfully, "I think it could be markedly shortened and fulfill its main objective, a plea for the support of basic or undirected research."

He also suggests in a question of Frits "Are there street cars in Moscow anyway? It seems important that one be careful not to insult them as a people."

He then comments on Frits's editorial presumably about the Nobel Prize winners, suggesting that from his knowledge of Kendall and Hench at the Mayo Clinic (Cortisone discoverers), that they had the Nobel Prize "on their minds over some years."

Frits replies on the 1st of April to the letter of Howard's suggestions for changes in his editorial on the relevance of irrelevant research, deleting the remarks he made about

Moscow and Russia and thanked him for the advice. He asks the publishers of his journal for permission to have a small historical highlights at the end of a number of papers. They have not heard back yet on this.

In a reply on May 18th, Howard indicates that he is going to Becky's graduation from Stanford. "It is a long and expensive trip to make for a short occasion, but with the importance of that place on education, it seems that it deserves top priority."

Jay Cohn sends Howard a note on May 23rd, '77 accepting with pleasure Frits Meijer's talk on Post Extrasystolic Relaxation in the Dog.

Again, the tender Howard says in concluding his June 2nd letter, "Ray Pruitt mentioned to me that he was rather nervous with the criticisms he had offered on your editorial (equivalent to my feelings), but I hope that both of us have been helpful and the editorial is now on its way to publication."

A 10th October letter from Frits is all social. Now he's scraped up \$500 honorarium and will pay all expenses for Howard and Margaret when they come to Amsterdam and Utrecht around the time of the British Cardiac Society meeting.

On November 3rd, Howard sends his detailed itinerary to Amsterdam and London in which he mentions that he plans to spend an afternoon in Evan Bedford's Library in The Royal College of Physicians in London.

In a letter to Frits on December 5, 1977, Howard encloses a page from the November 28th JAMA noting that Dutch patients are to be operated on in England. The Dutch Heart Association has contracted with two hospitals in London to perform open-heart surgery in approximately 1,000 patients a year through a unique air-bridge between the two cities, both are private hospitals, St. Anthony's Hospital and Princess Grace Hospital, which is a sister hospital to the Harley Street Clinic, "which performed more open-heart surgery than any other hospital in the United Kingdom." Similar air lift agreements existed before between the Dutch Heart Association and cardiovascular hospitals in Houston and Geneva. The Netherlands program can only serve 2,300 heart patients a year, and 5,000 need surgery.

In a December 5th letter, Howard describes an air trip to a Miami meeting in the same compartment as John Goodwin and Walter Somerland, and how they were so buried in their papers that he did not exploit any opportunity to discuss the meeting with them. "I am still in awe of British reserve and sensitive to the charge of American brashness." He expresses appreciation for the hospitality on their recent visit in Holland, and his apology for being jet-lagged and sleepy the first day. Again he thanks for tulip bulbs.

Part III

February 4, 1978 from Howard to Fritz. Howard explains how he, away from his files in California, had decided not to prepare a paper on the history of clinical cardiology for Frits's new journal, the European Journal of Cardiology.

Howard describes his consultation at Stanford as, he thinks, worthwhile, "but lacking in discussions or arguments with senior people" as he enjoys so much in Amsterdam and Utrecht. He did offer to write a review of papers on Einthoven in the European Journal for an American journal and he closes with a postscript asking Frits whether he was looking for anything on William Harvey to celebrate the April 1st, Harvey's 400th birthday.

Frits to Howard on April 12, answers all these questions and indicates he is going to have a swing around the country to see the Marquette ECG system and the other package systems in Los Angeles and Minneapolis at Hennepin County with Maury Hodges.

On April 16th Howard is in Tucson and indicates that he is revising a manuscript on the history of electrocardiography which presumably was published shortly thereafter in the European Journal of Cardiology. We should find that article. It apparently represented a talk he had given, I'm not sure where.

In Frits's reply of June 13th he again mentions his paper on the relevance of irrelevant research, which we should look up, in the American Journal of Cardiology in 1978. Frits mentions the recent visit to Utrecht of Charles Fisch as being a great success.

In his June 22nd reply, Burchell mentions the Raymond Pruitt editorial on the Graying of Academic Cardiology, in the Proceedings of the Mayo Clinic, sometime in 1978, which would be interesting to compare to our present situation of the graying of cardiovascular epidemiology. Burchell indicates he wasn't sure that it "was accurately representative of either the facts or the problem but nevertheless his essay was a joy to read."

On August 7th, Frits replies having just attended the 400th anniversary of William Harvey, celebrated in London. He mentions that he has not discussed his editorial on the relevance of irrelevant research with his long-term colleague Dirk Durrer because "It is increasingly difficult to catch Dirk's ear for anything that does not directly concern himself or fits his own interest. He had become more and more reclusive and it is very difficult to approach him. "Our mutual understanding is perfect, though I can't communicate about anything outside his own field of vision. It is a pity and of great concern to all his friends because he isolates himself more and more." Apparently Durer had recent had a prostatectomy and his wife also had health problems. Frits says he regretted that there was so little he could do for them.

He reacted very positively and strongly to Pruitt's editorial on the graying of academic cardiology, and proposed another factor, the awareness of young people in medicine of the side effects of science and technology, speculating that "medical progress mainly based on

medical science might have reached the limit of a positive cost-benefit balance. Therefore, academic medicine is losing its shine and glamour and the younger generation often rather talk with patients than treat them with batteries of technical and chemical methods.”

He then discusses his communication with Charles Fisch’s group on the subject of post-extrasystolic potentiation, which “seems to get a new life because it sometimes can demonstrate viable myocardium in infarcted areas.”

He also raves that he’s just gotten \$650,000 for a new computer ECG system in his hospital, and that they have also started their cardiac surgery program at the academic hospital of Utrecht. [At Meijler’s invitation, I sat on the 1976? Arnhem Conference that recommended the Netherlands make a commitment to cardiac surgery, based on some estimates I made of the presumed frequency and need for by-pass, etc. They sent all cases to UK or US at the time.]

Again, Howard replies in a hand-written letter of August 20th indicating that he is storing up for Frits’s visit a barrage of questions about the William Harvey celebration, his current work, and the cardiological scene in Holland.

Howard replies on October 20th, after having visited with Frits and Anne Marie on their visit to Rochester.

In his reply of November 28th, Frits mentions in a postscript that he has a theory on atherosclerosis that he is going to write in English and send to Howard. [look for it in later letters!]

Howard replies on December 13th attaching an essay on “Nutrition and Atherosclerosis, a Historical Mistake?” It sounds like something that McMichaels would write and we must try to find that title. Or maybe it’s something that Howard wrote. At any rate, he called it “an essay” and didn’t say it was published.

Howard goes on to explain the essay and say in his December 13th letter “In respect to the essay on nutrition, it is clear that I am on the opposite side of the fence from you and Sir John McMichaels. Though never a diet evangelist I have thought it played a role in the complex multi-factorial causation of atherosclerosis, and I do not believe it can be erased from the slate of risk factors yet. I do admit that as a direct cause of atherosclerosis, it has misled many people and possibly there has been more change in the social and economic features of eating than warranted. It is good to have debates on issues, and your essay is obviously helpful in stimulating people to look at the data and critically judge what conclusions seem proper.” This clearly sets them on opposite sides, but Howard has a very cautious approach to the diet-heart theory.

In his reply of January 11, 1979, Frits is pleased that his journal, the European Journal of Cardiology, is to become the official journal of the European Society of Cardiology. He says he looks forward to that “because I think that the present Chief Editor needs a rest.”

In February 27th he acknowledges receipt of a book by Julius Comrow on the Retrospectroscope. He tells what I hope is a joke that he heard Comrow saying at a lecture somewhere, "Never repeat a successful experiment."

In his hand-written reply of February 14th, 1979, Frits mentions an extensive article in *Acta Medica Scandinavica*, presumably in early 1979, "Quite critical of present practices, particularly in the USA." We must look that up.

In his reply of April 7th to Frits, Howard speaks of the cooling of interest in the dog model of coronary ligation to study myocardial infarct size. "The importance of modifying myocardial damage remains a high priority research area, but how it can be done in the human with coronary disease seems to be the difficult question."

He indicates that the Stanford University Medical Center is putting in the Hewlett Packard automated ECG program. How could they do otherwise with Hewlett Packard next door. Howard says he thinks that's a good decision because that system is working very well at Hennepin County Hospital. Howard indicates that he's encouraging this computerization at Stanford. And he's also questioning a study on magnetocardiography.

July 17, 1979, Howard to Frits, mentions a fuel shortage that he hopes will jar people into the reality that "our spendthrift ways on energy cannot go on by logarithmic increments." He writes from the Helmholtz House in Shoto, Wisconsin, which apparently is the lake cabin of his wife's grandfather, in 19th Century Germanic style.

July 31st, Frits replies in a type-written letter in which he announces that he's retiring as editor of the European Journal of Cardiology, and indicates that he was unable to push an agreement between the publisher and the European Society of Cardiology before he retired from the position and blames it on an arrogant and difficult man, the publisher. At that moment, the European Society began a new journal called the European Heart Journal. He indicates that they are planning to go to Switzerland for a hiking holiday, chased into the mountains by Anne Marie to lose weight, and that his wife can be her active self. They will be joined by their children. He describes his daughter, who he hopes will become a pediatrician, taking a job with Charles Fisch in Indianapolis, and his son, Theo, who had his first year at the Technical University in Delf.

Howard sends a postcard in celebration of William Harvey from the National Portrait Gallery. It's a portrait called "The Rolling Park Portrait" showing Harvey in an oval frame with a detailed outline of the circulation on an easel below the portrait, with an interesting symbol of Asclepius with a snake coiled around a stick among tombs at the base of the picture. Harvey has a delicious, long, white, narrow beard. Looks as if it were his tongue extending from his mouth.

In Howard's reply to Frits from Abbott Northwestern Hospital in August 21, 1979, he compares the European Journal of Cardiology-European Society split to that of the American Heart Association and the American Heart Journal about 1950, with the Association starting Circulation. And Mosby, the owner of the American Heart Journal

continuing with George Burch as new editor. [and the Am College of Cardiology splitting from the Am J of Cardiology]

In a letter of July 25th, Howard goes on at length about the fact that William Harvey's image in the portrait from the National Portrait Gallery, is reversed on the cover of the European Heart Journal. He suggests that the engraving of Harvey was done from a portrait in the Huntarian Collection in Glasgow and thus the face and figure became a mirror image of the original. Then Howard goes on in his scholarly way to indicate that various versions of Harvey's first conception of Circulation, whether it was at age 38, 41, or 50, based on various versions.

In his reply on November 20th, Frits is very complimentary about Burchell's paper with Naip Tuna on axis deviation just published in the European Journal of Cardiology as a very fine piece of work. Frits bemoans the fact that "I am afraid that many people have a pacemaker these days because of a right bundle branch block pattern post left axis? deviation on the surface ECG. I sometimes think that dogmatism is even more outspoken in medicine than in religion."

Christmas, 1979, has a Christmas card from Frits with a picture of him with his extended family outside their home, with Howard Burchell seated with him.

January 23, 1980, Howard writes to Frits in handwriting that at the American College of Cardiology meeting he had introduced Durrer to Jay Cohn, "with the generation of a bit of

an argument.” Then they share information and ideas on the “criminal use of digitalis” and mentions two stories in fiction in which digitalis was used with homicidal intent.

Frits on February 12th sends a copy of his paper on a murder attempt with digitalis, which appeared in the Dutch Medical Journal, volume 116, page 2297, in 1972. Frits made the diagnosis on ECG tracings made at the time of an emergency abdominal operation in which no explanation for the symptoms was found because they were all due to digitalis intoxication with digoxin levels of 12.6 nannograms per liter, two days after beginning of the symptoms, one day after the surgery. At the time of the cardiogram, the digoxin level was probably close to 15. The article has serial ECGs up to eight days and the ----18.43 digoxin levels over time. ---- while they believed in his diagnosis, his request for daily samples was sabotaged. Nevertheless, the case was solved. It was an attempted murder by her uncle, a pharmacist, who was in love with the girl who didn’t like his advances. Her uncle substituted some of the pills she took because of her monthly pains, with similarly looking pills, probably containing more than 100 mg of digoxin.

On May 7, 1980, Frits writes about their having a new Queen in their part of the world, but that cardiology here is “as usual not much spectacular.”

There is a typewritten table with eight cases from various countries: England, France, Germany, Belgium, Israel and Holland, in which digitalis was used with evil intent. The accused in one case was an herbalist, one was a physician, several were physicians, one was a nurse, one was a friend, one was a chemist. The victims were an apprentice, a widow, a

mistress, a husband of a mistress, a girl friend. In the nurse case, she killed 26 people --- 20.33 one in 1863 in France called the Nowgave 20.37 evidence, and one in Germany in 1876. Digitalis also was used to avoid military service. And one husband, with a mistress, when oysters at a wedding dinner were poisoned. In one case an ear, nose and throat man did a physical exam to his girlfriend with strophanthin on a rubber glove. The nurse who killed 26 persons was a volunteer who helped with housework for widows and elderly, lonely persons.

The Chinese chemist who was in Holland in 1972 had gotten a gold medal as a student for his research on digitalis. He claimed he wished to punish not kill. He used the digoxin in ----- 21.34 and in bons bons for a birthday present.

In the French case, the physician was guillotined, most amusing.

Howard indicates that he gave his talk before an historical society around 1980. I doubt it was published. Correction; his typed manuscript was sent to Frits on July 7, 1980.

Forensic Fox Glove Fields: Fiction and Facts. A 35-page manuscript with several pages, 60 references. It seems that Howard sent Frits a copy of the forensic digitalis paper in July 1980 and Frits suggested he send it to Desmond Julian for the European Heart Journal. We'll see whether that occurred.

On May 20, 1981, Fritz invites Howard to give a talk at his symposium of Dirk Durrer on Certainties and Uncertainties in Coronary Heart Disease which would be co-chaired by

Durrer, Hugenholtz and Meijler. They hope that Howard would talk about the use of angiography in the diagnosis and treatment of coronary disease.

Ends with the letter of May 22, 1981.

Part IV.

May 21, 1981, Frits to Howard; Fritz asks Howard for references on electrocardiographic studies in young military personnel. They are doing an ECG study of Dutch military conscripts. He follows that up with a letter of June 10, 1981 with his argument that the atria themselves are responsible for the irregular ventricular response in atrial fibrillation, not the AV node. And he announces the bicentennial of digitalis conference scheduled for Spring, 1985 in the UK.

June 19, 1981. Howard to Frits. Thanking for the manuscript on the AV nodal memory which he promises to criticize. He expresses skepticism that anything exciting will turn up from an ECG study of military conscripts, and refers to a 1959 symposium with the table of contents he sends (he will sign out the volume and copy whatever Fritz is interested in). He refers to a study of QT interval in soldiers in the American Heart Journal of 1946. So , typically, Howard answers both in general terms and in specific terms, very helpfully.

August 3, 1981. Frits to Howard in which they announce a visit to Seattle to visit their son, Theo Dirk, who has been taking physics at the University of Washington and they plan to arrive in Rochester August 30th (for Frits's checkup?), and regrets they won't be able to come up to St. Paul for a visit.

June 30, 1981. Howard to Frits, Howard thanking for an invitation to Frits's symposium called "Certainties and Uncertainties in Coronary Heart Disease" for November 1981, and accepts the invitation and the topic suggested for him: "The role of coronary angiography in diagnosis." Howard then describes a meeting with Ray Pruitt at the graduate exercises of the Mayo Medical School in 1981.

June 12, 1981 Fritz to Howard, welcoming the Burchells and the Pruitts soon to visit to Amsterdam.

October 14, 1981 Howard to Frits, in which they announce their upcoming visit with concern that the tickets had not yet arrived and described their subsequent plans for travel in Zeeland and to Leiden and renew an invitation to Frits and Dirk Durrer to attend the American Heart meeting in Dallas in November.

A printed CV on Howard Burchell from which I put down some details.

November 28, 1907, born Athens, Ontario, Canada. MD 1932 University of Toronto, PhD 1940 University of Minnesota; internship in pathology at Toronto General, Mellon Scholar Mercy Hospital, Pittsburgh; 1936-39; Fellow in Medicine, Mayo; 1939 Special Student, London Hospital Medical School; 1940-41 Internal Medicine Mayo Clinic; 1942-46 U.S. Army Corps instructor in aviation medicine, consultant in medicine, acting director Provisional Research Center, Heidelberg, Germany; 1945-68 Consultant in Medicine and Cardiology, Mayo Clinic; 1968-75 Professor of Medicine, Chief Cardiologist, University of Minnesota; 1975-77 cardiologic consultant, Northwestern Hospital;

1976-present, consultant to many hospitals, visiting professor at Stanford; 1976-81 Visiting Professor, Arizona; 1978-81 Certified Board of Internal Medicine; 1941 Board of Preventive Medicine; 1954 Cardiovascular Diseases; 1977 Member of AOA and Sigma Xi; Member of American Physiological Society, American Heart Association; Association of Medical Physicians, AMA; Central Society of Clinical Research, Aerospace Medical Association.

Nov 20 1981 Howard to Frits, in which Howard regrets their missing contact in Dallas. Expresses his pleasure over Dirk Durrer's presentation at Dallas and expresses relief that there was no overt criticism of the VA Study on Nitroprussides. He expresses pleasure of the exhibit about the PR Interval in different species and expresses gratitude for the symposium they attended in Amsterdam and hopes he will recover the slides he left in the carousel.

Dec 2, 1981 Frits to Howard, Nice regards from their recent visit.

September 6, 1982 Howard to Frits, in which Howard speaks of the upcoming Withering bi-centennial digitalis commemorative. Howard announces that his gall bladder had been removed and that he is convalescing satisfactorily following an acute bout of cholecystitis and they found four stones in the common duct that had not showed up on x-ray or echo. He has a T-tube in place and is quite unaware of its presence. And they are already talking about meeting at this year's American Heart Association.

July 10, 1982 Burchell to Charlie Krikler, supporting the idea of a digitalis symposium.

“It would wonderful if England would put out a commorative stamp but doubt that they would. It is so rare that they put out special stamps.”

March 4, 1983. Howard to Frits A personal letter about the health of Ina Durrer.

The current publication of Howard’s article on digitalis from the Journal of American College of Cardiology including a case sent to him by Frits.

March 20, 1983. Howard to Frits. Handwritten on Stanford University Medical Center stationery, in which Howard is terribly regretful that he won’t be able to come to Amsterdam for recognition of Durrer and asking for the best advice at what time of day on the week-end to call the Durrer family to commiserate.

April 24, 1983. Howard to Frits, Happy to hear about Frits’s favorable report from a Mayo Clinic check-up, and they speak of the immunological diagnosis suggested. He is thanking him for the beautiful enlargements of pictures taken in Amsterdam meetings (and others) and recounts that Paul Hugenholtz translated his paper concerning indications for coronary arteriography editing for the Dutch Society Newsletter.

He comments on Frits’s article on **“Future trends in prevention of coronary heart disease” vol 10 of Progress in Cardiology. “And while I like it, its provocative style, we disagree I think on the conceptual aspects and usefulness of risk factors. I do not concur in these being an historical mistake. A rash of mistakes regarding meaning, probably, but not to my mind in concepts which have or should have been never**

equated to specific causation. I suppose you could have enlarged from the discussion of the localization of the disease, but I guess it's ok as it is. Very sincerely regards to all." -

[This is one of the rare exchanges about Frits's conservatism and skepticism over prevention in CVD and I intend to look at that article.]

June 27, 1983. Howard to Frits. They discuss institutes, including NIH, that receive patients for heart experimentation. And they speak of a "peculiar disease in which Howard thinks that the answer will come, if it comes, "from virology or immunology." The disease remains mysteriously unidentified.

Aug 27, 1983. Howard to Frits. Anticipating a new U.S. visit from Frits Meijler. He discusses extensive Burchell family travels to Laguna Beach to visit relatives, the Hultgrens, (Margaret's family). Then to the American Heart Meeting and then to the British Cardiological Society and then to the Einthoven Symposium. And Howard proposes to repeat the Flushing Expedition (?) hoping for better weather.

Sept 10, 1983, Frits to Howard, discussing the upcoming Einthoven Symposium, all personal.

September 24, 1983 Howard to Frits, in which Howard accepts an invitation to visit the Meijlers following the Einthoven Conference and they discuss Frits's upcoming visit to Minnesota. They commiserate over Ray Pruitt's depressed demeanor and his retirement in Memphis in which he "gave in to the wishes of his family."

And Howard assures Frits that he's still working on his AV conduction paper but hasn't come to any conclusions.

Oct 29, 1983 Howard to Frits, commenting on his interest in Frits studying the AV node in embryonic chicks. Commiserations over the ill health of Dirk Durrer with little reason for optimism. Howard announces that he has put up an exhibit in the U. of Minnesota library showing old herbals and medical botanics with illustrations of his beloved foxglove.

Nov 8, 1983 Howard to Frits and Anne Marie in which visit Fritz did not get to see Howard's herbal exhibit. [Neither unfortunately, did I.]

Dec 5, 1983. From Howard to Frits, After a pleasant visit to the Einthoven Symposium and with the Meijlers, Howard announces that he plans to keep in regular correspondence with Dirk Durrer who is in ill health, to exchange ideas and articles with him in the areas of their interest in electrophysiology. Howard mentions a copy of Herrick's banquet speech, "Why I read Chaucer at 70." And, I quote: "I confess I found it rather tedious at times and it was lengthy. " He also remarks on an editorial by Charlie Fisch, which was seemingly without illustrations and he found old illustrations in the Thomas Lewis paper that would have been useful.

He also remarks "There is really not a really good description of the Ashman Phenomenon by Ashman."

He discusses Scherf and Schott's book on Extrasystoles and a whole series of references to ancient writings and suggests that the first electrocardiogram showing a ventricular extrasystole was from Einthoven in 1906

("I would have expected it to be earlier, check my translation of Eithoven from AH)

, Dec 29, 1983 Letter from Howard to Frits hoping for an optimistic time for the world at New Years. And refers Frits to Robert King, retired in Seattle, for his work on the whale electrocardiogram and indicates that he would be happy to contact others like Hal Dodge and Bob Rushmer and Alan Sher for future explorations of the whale ECG. Frits is interested.

So the Withering (digitalis) festival is to happen in 1985, in which Howard is invited to chair a panel where Frits would be one of the debaters. "What fun!?" "I shall have to bone up on the official debating rules!" He says "April, '85 is a long time away, but looking at actuarial charts, I should have 4 chances out of 5 of being able to go and function as chairperson."

Another discussion of the uncomfortable relationship between Anton Becker?, Dirk Durrer, and Frits and discussion of health and weather.

Feb 11, 1984. From Howard to Frits Howard is still reading and circulating Frits's paper on AV conduction, including that in the whale. And Howard expresses his increasing excitement about the Digitalis Symposium. He still hopes to hear more about the relation of function to morphology of AV conduction and the AV node.

And they commiserate over Dirk Durrer's deteriorating health.

March 3, 1984. Howard to Frits, Discussion of the death of Dirk Durrer in a telephone call.

Howard is now worrying about writing a tribute to Dirk. "I am not very good at expressing myself to people, particularly at times of bereavement, but have posted off a note to Ina this morning."

They are still talking about AV conduction time in relationship to anatomy and vagal and sympathetic activity, and they refer to Paul White's old study of the whale ECG and the elephant, in which the data are inadequate. He indicated that David Benditt "replayed the data normalizing the PR (for heart rate) with the human as unity and came up with the old conclusion that a relationship [of P-R] to anatomical size of the heart and AV node would not be linear."

They talk about the upcoming visit of Tom James to Meijler in which Howard expects the visit to be profitable and pleasant. And he describes his own exchanges with James, happy and philosophic exchanges on the relationship of structure and function. And he refers him to James's Lewis lecture that was "superb."

"In my over enthusiasm for disputation, . . . last year in what I wrote to him, I lost his friendship. Curiously now as it brought back my guilt feelings concerning my attempt at facetious humor about inter-atrial conduction, which may have aggregated the Dirk-Heim Wellens break."

[Interesting, the same sort of thing that happened with me, HB, with Howard's "disputatious nature," and my finally suggesting to him that he might simply become "contrarian," which upset him considerably. Looks like he was in 1984 already becoming aware of his "overenthusiasm for disputation" Henry B]

March 15, 1984 Howard to Frits, commenting on Frits's devoted support of Dirk Durrer in his last years of failing health.

They speak about the publication of Frits's paper on atrial fibrillation in the horse. Howard wrote Frits that he would like him to do what he asked Tom James to consider, "A review of the comparative anatomy of the AV conduction tissues and their embryology."

March 20, 1984, Howard to Frits. First day of spring and they talk about weather and health.

Howard wanted to bring up the issue of intra-atrial conduction time as it contributed to the PR interval. "In the elephant and whale, this could contribute to the total PR interval in the conventional ECG. " And he refers for the first time to Frits's scaling of the mammalian AV conduction system and "again found it stimulating but difficult to define the basic concepts." He says it might have been useful in your editorial to have a comment on the effect of digitalis on the AV conduction time in heart transplants, which was manifest only with pacing rapidly." *Circulation*, May 1978.

Part V.

March 20, 1984 Howard to Frits. Howard speaks with gratitude about a telegraphic message from Frits and Charlie Fisch about some sort of convocation in which he and Margaret were involved. "I am a bit ill at ease in formal convocations with robes and directed traditional behavior. But the convocation was nevertheless a pleasant occasion and I think Margaret enjoyed being there." He commiserates over the recent death of Dirk Durrer. He mysteriously speculates that it was "contraindicated" to show a paper on nitroprusside effects to Jay Cohn, Minnesota cardiologist, and that it would be a toss-up whether the New England Journal would accept it but that follow-up data would have increased the chances of acceptance.

Howard states that he is trying to rearrange his hypotheses concerning AV conduction delays. "And if I get any organized proposals will convey them to you. The tremendous variation in the normal population of PR intervals is still mysterious to me as is the meaning of potentials recorded over the AV node." He indicates that in the recent Dallas American Heart Meetings he did not see Heim Wellens, but did say hello to Ernst Arntzenius and to Kulbertus but only in "a quick nod of recognition."

Then he asks that Frits and Gerda get him a picture of fields of foxglove in Holland because he had just learned that all the digoxin made by Burroughs- Williams, a drug company, comes from digitalis grown in Holland. "It is shipped in large bales to the plant in North

Carolina where the warehouse holds enough in storage for a year's needs." Howard is a bit surprised because he thought that perhaps most of it was manufactured synthetically.

April 17, 1984 Howard to Frits. He acknowledges receipt of a paper on comparative AV conduction and hopes that Circulation will accept it. He said that if he read it as an editor he would accept it, but it might be considered more appropriate for Circulation Research. And in his usual soft, indirect manner, he comments critically: "One would entertain the suspicion that some minor revisions would be recommended." As an editor, he would recommend two referees, Charlie Fisch and Tom James. He also, if he were to serve as editor, "would be ambivalent about whether to have an editorial about the paper in the same issue." He himself might ask to write such an editorial because there were items in the article troubling to him. "Maybe I shall imagine that I do not know you and have received the paper for review and dutifully write a critique for you to look at." That's his quietly firm way of indicating that he still has some problems with Frits' paper.

April 24, 1984 Howard to Frits: He thanks Frits for the Engelman papers and for the Brahm's String Quartet dedicated to Engelman. And he expresses gratitude for the translation of Dirk's paper on "the rediscovery of Engelman."

He promises to organize his thoughts better about AV conduction for their upcoming meeting and indicates he will be pressing Frits for details on disputations by Tom James and Charlie Fisch. Apparently Fisch had received an honorary doctorate in Holland, kindly and thoughtfully arranged by Frits. He also indicates he will be exploring Frits' ideas about a digitalis debate to take place the following spring.

May 17, 1984, Howard to Frits. After they had met at a conference, he hopes that Frits had a good flight home. He indicates he has heard from a Dr. Anderson about a forthcoming volume in honor of Dirk Durrer and that Frits will be writing Dirk's obituary. He indicated that he's writing about Dirk's role in American developments in cardiology and he is interested if Frits has access to Dirk's guestbook and how many Americans spent a significant amount of time in Dirk's laboratory.

He had just attended a PhD thesis on surgical cardioplegia and was disappointed in the student's presentation which was disorganized and with his inability to answer questions about why Ringer had not observed the calcium paradox. He gave the student a reference to Frits and Dirk's remarks on the subject. In preparation for the PhD exam, Howard had gone through publications by Ringer, of Ringer Solution fame, explaining that he had more "permanent systolic contraction during warmer weather than cold weather." Whatever permanent systolic contraction means --- presumably premature?

June 8, 1984, Howard to Frits in which he expresses disappointment in Bernie Sobel's response to the PR paper of Frits. (Sobel being the editor of Circulation.) He said that he did not expect an administrative "nyet." "Dr. Sobel is an excellent investigator and physician and sometimes if one could catch him in a relaxed leisure moment, it would be interesting to have him discuss his journal policy as editor. I know the paper means a great deal to you and maybe I could have given you better and stronger advice how it best be submitted."

He closes with his memoriam statement for Dirk Durrer and asks Frits' candid opinion about it. He was tempted to put in the cliché phrase, "That he did not suffer fools gladly" but resisted the temptation.

June 29, 1984 from Howard to Frits acknowledging Frits' letter of the 15th of June with thanks for Frits's opinion on his memorial statements for Dirk Durrer.

"Bert Sobel's note accompanying the return of your manuscript is not happily phrased and I note that he did not sign the note himself. He is basically a fine person and a superior investigator. Maybe there is an element of hubris but hope not. That's not a big factor. I remember the New England Journal of Medicine editorial and wondered how many people like myself scurried off to the biggest dictionary to learn more about the meaning and roots of the word 'hubris.'"

He refers Frits to an editorial in Nature about science in the Low Countries and wonders about the health of The Netherlands' universities and gives a little sermon apparently at Frits' request for information about the term, "he did not suffer fools gladly" saying that it's derived from St. Paul's epistle to the Corinthians. "For ye suffer fools gladly. Sing me yourselves are wise." "You will note that the cliché changes the positive to the negative. I suspect all in all it's sort of ambiguous and thus, not a good thing to communicate."

"Today I went on a small botanical safari to see a place where it is said that foxglove was luxuriating in the wild. I think the intelligence was correct but it was a different species for sure with small tightly-packed clusters in the spike and slender leaves. It may be a variety of digitalis lanata. If so, it will be interesting to learn what the plants are like growing in Holland."

July 3, 1984 from Howard to Frits. Our letters are now crossing in the mail, which I guess is not serious, although I may repeat myself a bit. He was pleased to get a preprint of Frits's article on "historical notes on Professor Dirk Durrer." I am sure readers of the European Heart Journal will like it. And here he talks about a memoriam that Frits wrote in the Journal of International Cardiology and he expresses his reservations in this roundabout way. "If I were the editor, I would probably ask an associate editor who was free of emotional attachment to Dirk Durrer to advise me. Maybe I would end up by saying I wish to publish anything new that Frits will write, but would limit the length and suggest reducing the worshipping aspect a little, but that would be our choice. I do not know whether the 'godfather' appellation is good or not. It would have been 20 years ago, but since the movies entitled Godfather I and II, which I have not seen, had been so popular, the meaning of the word for many people may have changed. For example, is there an inference to be drawn that Dirk was a dictator of a Dutch cardiological mafia?"

He asked if Joste and Gerda, presumably relatives of Dirk, have copies of Dirk Durrer's thesis and he is happy to return his personal copy if they need it.

Howard mentioned that he has been asked by David Benditt to write a historic review on preexcitation. He includes a photocopy personally signed, autographed cover of Dirk Durrer's thesis, April 8, 1972, Amsterdam. "To Howard Burchell, Visiting Professor of Cardiology, The Netherlands Inter-Faculty Institute of Cardiology. In friendship and admiration I offer this piece of 'juvenile delinquency' written in 1952."

Part VI.

July 22, 1984 Burchell to Frits where Burchell writes from Nasota, Wisconsin, the summer home of Margaret Burchell's grandparents. Howard refers to an obituary on Durrer, entitled "Durrer, the godfather." He speaks with enthusiasm about the piece and reiterates that he is sending Dirk Durrer's thesis written in Dutch for Frits's library as he is breaking up his own library. He mentioned that Thomas Lewis' book on graphic registration of the heartbeat sells for around \$200 a copy in his country. (1982 dollars) Another paragraph describing in unusual detail a plant he found, *digitalis lanata*, that "escaped from the nursery" but was not as beautiful as *d.purpurea*. "It has tight clusters of small flowers on the spike and resembles a wooly tail coated with burrs."

August 6, 1984 Another handwritten letter after his return from holiday in Wisconsin. He's speaking enthusiastically about an interesting correspondence he had set up with Bob Anderson about Wolf-Parkinson-White Syndrome and historical figures, Paladino, Kent, His, and Tawara. Howard worries excessively, but in some ways appropriately about his overly critical view. "I must get busy on Gust's paper. I worry about being too critical and perhaps bringing up details of little or no consequence." Also afraid that his comments "raise your hackles." But, on the other hand, he hopes it might just provoke Frits enough to set the stage "for a pleasant argument." He agrees that a "digitalis stand" in the scientific exhibit that they are planning somewhere, is a great idea and would be undoubted success.

Again he argues with himself if maybe he should withhold his critique for a while and let it mature, or, on the other hand, "I send it off with abandon and possibly reap the unexpected."

And he accompanies this letter with a detailed handwritten critique of the article (by Frits?) which has to do with training the primary care physician on the subject of atrial fibrillation. He prefaces it by saying that most of his points are rather minor ones. He challenges the statement that atrial fibrillation is the most common of all cardiac arrhythmias. "I think premature beats are and they increase in prevalence with each decade of life." He asks how can you call atrial fibrillation the grandfather of cardiac arrhythmias? This would imply a genealogical relationship that knowledge of atrial fibrillation spawned an understanding of all other arrhythmias, which he doubts.

All love and respect for you Arthur S. notwithstanding. As much evidence that it's not the "eldest arrhythmia we know." Ventricular premature beats were created by Harvey close to 400 years ago by touching a pigeon's stopped heart and probably noted by many of the old pulse-takers as was clarified by McKenzie, and was of interest to Einthoven who created them by tapping the chest and so forth. He says, "I have heard the old master, Sir Thomas Lewis say, if you have a patient with an irregularity of the heart suspected of being atrial fibrillation, exercise him or her, and if the irregularity persists even more chaotic, one's diagnosis can be definite." Burchell goes on to say that this is true but not at very high heart rates, although it is generally true that the higher the heart rate, the less apparent because of the irregularity. He then asked whether a section on ventricular fibrillation is germane to the subject of atrial fibrillation. He expressed the interest that

there was no consideration of whether digitalis had an action that would be direct on atrial fibrillation as well as its vagil action, which was John McMichael's idea.

He questions whether atrial fibrillation is statistically established as a complication of diabetes, and he suggests that the atrial arrhythmia associated with advanced emphysema is more likely to be a multifocal atrial tachycardia than atrial fibrillation.

He suggests a greater emphasis on the random direction of the multiple entries to the AV node in atrial fibrillation. He questions whether 600 beats requires an awfully smaller refractory period for the entrances. And with regard to the coexistence of atrial fibrillation and WPW on the ----- accessory pathways seems to lack the capacity for concealed conduction. He asks if this is so, why the variation in ventricular cycle length at rates between 180 and 300.

August 28, 1984 Howard to Frits. He says, ask me about trees, lakes, fish, birds and forest fire effects. I've just come back from ecology camp with Margaret. He was relieved to find that you enjoyed his disputatious comments about the atrial fibrillation paper and to have "your spirited rebuttal." Apparently this paper is Frits's paper and not Anderson's paper. I'm confused. "I remember Sir John Parkinson telling how Sir James McKenzie used to listen for an attempt to identify atrial prematures as forerunners of atrial fibrillation." He quotes this in his perception of Frits's error in talking about atrial fibrillation as the grandfather of arrhythmias.. about the idea that Type A premature is more dangerous than Type B has largely been discredited.

August 29, 1984 We have a reply the very next day, presumably not yet having received Howard's article, a typed letter from Frits to Howard where they set the date for Jost Durrer's PhD thesis ceremony. That's apparently the son of Dirk Durrer, and Howard is invited to it with tickets for Howard and Margaret and all expenses cared for.

September 8, 1984 Howard replies about Jost's doctoral ceremony and the wonderful invitation and the offer to defray our expenses. He would worry about accepting expenses for Margaret, as they should not come from university sources. And he accepts only in a qualified sense the invitation. Now he explains that he, himself, discovered the area near the St. Croix River near St. Paul, in which the *digitalis lanata* had escaped from a nearby nursery. And they were comparing pictures of the types of *digitalis* plant.

October 17, 1984 Howard to Frits, encloses a photo of Margaret harvesting the escaped *digitalis lanata* near Afton on the St. Croix River. In this same letter he sends a little clipping from the BMJ of August 16, 1913, describing a session of some medical congress paying tribute to the work of an English school on cardiac contractility in which the famed Professor Wenckebach from Strasburg, acknowledges his debt to English clinicians and with a comment by Professor Waller. I presume that would be Augustus Waller, the electrocardiographer. who spoke of correlation of the size of an animal to the pulse rate, and the AV interval in horse, man and dog. Howard enclosed another cut-out on the use and safety of verapamil to control exercise-induced tachycardia. He accepts a new invitation to write an article, an introduction to Dirk Durrer's works, with Frits and then reviews their spring trip to Holland to spend visiting Oxford, Cambridge and Dundee.

And then he discusses whether some glycosides are more effective than others on AV conduction in relation to inotropic action. He refers to the photograph of Margaret with the digitalis plant, where the digitalis was growing on the St. Croix River, and indicates that he cut off the widow of Owen Wangenstein from the picture.

October 30, 1984 Handwritten letter from Howard to Frits. They speak of harvesting foxglove in Holland during which harvest Frits took pictures of a cloudy Dutch sky and blowing rain. He makes the rare political comment seen in this correspondence. This would be October 1984, just prior to the election, or the re-election that would be of Ronald Reagan. He says, "Do you follow the political activities here? I expect Reagan will win, but worry whether it will be best in the long run." Interesting. Howard was a moderate Republican.

November 17, 1984 Letter from Howard to Frits. He says that he has time to write only a few words before he goes out to rake the fall leaves. Mainly social chit-chat.

December 8, 1984 Letter from Howard to Frits acknowledges a November 25th letter, reiterating that he was very much missed at Dennis's lecture, which was superb, at the Miami AHA meeting. They discuss getting a stamp issued to Dirk Durrer through the Queen Mother. He then indicates that he is going to send him a Frits a subscription to Circulation Research for 1985 as a Christmas gift and that Frits is not to remonstrate against this, please. And he adds a little tender recollection as a postscript. "Your letter was posted exactly one year after we were walking against the stiff breeze on the dikes. Margaret was worried about her constipation, and Marie was bravely denying her shoulder was hurting, and we had a wonderful fish meal at the Veere Hotel." Signed H.

December 10, 1984 A little Christmas note to Fritz and Anne Marie thanking them for something called the “digitalis lanata.” Must be a lovely picture of the plant which they are going to have framed. And there is a photograph of Howard in the field of digitalis lanata from their July expedition.

February 5, 1985 A type-written letter to Frits from Howard. They talk about Frits stepping down from being chief of cardiology to take over leadership of the All-University Institute. He will miss seeing Frits in Anaheim because he’s decided not to go to the American College meeting and invites him to Minneapolis. This Robert Anderson he was speaking of obviously works at the Brompton Hospital in London and they discuss details of his upcoming visit.

February 16, 1985 Handwritten letter from Howard. Says that he won’t be going to the digitalis symposium unless some executive or acquaintance offers him to fly him West on a corporate jet. It’s a cold, cloudy damp day, Saturday morning, fitting to his mood, but it will cheer him up to write Frits, he claims.

February 26, 1985 Letter from Howard to Frits and apparently Jost Durrer’s PhD ceremony has been postponed until the spring so Howard is going to be able to attend it.

February 27, 1985 Handwritten letter from Howard, hot and heavy correspondence following a telephone call. Their travel plans affected by the pregnancy of their daughter, Susan. Just travel chit-chat.

March 3, 1985 "We are storm-bound and pretty well confined to the house with the worst storm of the year. We have heat and light. In many ways it is pleasant. A reminder of how lucky we are in general."

Now there's a marvelous photograph of Frits operating a power mower dated 1985, April.

March 17, 1985 Letter from Howard to Frits. He indicates that he will be picking out areas to suggest for revisions in Frits' treatise on the AV node. He's unable to speculate whether the New England Journal would be interested in the article as he says the editors "are always somewhat capricious, it seems."

He speaks of a vendetta being carried on by the Wall Street Journal against Dr. Relman, who at that time was the editor of the NEJM. And he encloses the editorial. The Wall Street Journal questioned why the Journal delayed publication beyond its usual 6-month review period, complaining that the editor, Arnold Relman would not offer an official explanation. During this delay, if the usual statistics applied, the editorial says, "Some 50,000 women had their breasts cut off after the leading researcher decided this most likely was not necessary. With all due respect for care in research, it seems to us that Dr. Relman – with that --- the medical profession – owes these women some explanation."

Then they end up with a diatribe against delays in FDA approval. "Why not tell the women that most experts favored mastectomies, but that enough favor lumpectomy that an 89 institution study is underway? Today's patients have rights too and it's time for the public to start pressing it's right to weigh for itself the risks and benefits of what medicine knows." That's the Wall Street Journal of March 15, 1985.

March 25, 1985 Letter from Howard to Frits. He's worried about the debate that is going to be carried out at the Holland meeting on digitalis, asking would it be weird if something like this evolved: "We should be using digitalis, then we would have a Professor Litler for and a Professor Guy against, Professor Meijler for, Professor Gibson against, and the rebuttal by Dr. Litler or Meijler." He indicates that he's been reading Robert Schuller's award, but it hasn't increased his confidence that he could be a good chairman of the debate.

March 30, 1985 Letter from Howard to Frits and Anne Marie. They talk about Jost's thesis with details that remain worrisome, some of which is semantics, some of which is interpretation. He indicates where they are likely to be challenged at the time Jost presents his dissertation. He then has a philosophical note about the evolution of mammalian defense mechanisms for survival over the millennia and that such interventions as nitro prusside, presumably the subject of Jost's thesis, are altering the "wisdom of the body."

April 3, 1985 Letter from Howard to Frits with much excitement about their pending visit to Holland. It's mainly chit-chat about their upcoming meeting. And a mention of a news report from a Royal Commission in Canada investigating baby deaths due to digoxin at the Toronto Sick Children's Hospital. "What a story!" Then an exchange of an invoice for \$1,150 for the work on the Durrer book.

Part VII.

May 24, 1985 Howard to Fritz: In this longhand letter on personal St. Paul stationery Howard enjoys playing around with a new copier machine, making, as he describes it, individual stationery folios. This one bears the head of Zeus with Greek writing around it. He refers to their recent telephone conversation, indicating that he's inquiring about the illustrations for a paper on excitation of the isolated human heart from some long-past article in *Circulation* when he was editor. He seems to be exploring this within Heart Association archives. In contrast to speaking of his classical stethoscope collection, here he writes of finding otoscope accessories and indicates that pieces can be bought in bulk, cheap.

Howard refers to a supplement of the *JACC* having pictures of foxglove "beautifully reproduced," and remarks: "I read your paper again and liked it. The paper should become a standard reference." They discuss commentaries from Van Dam and anticipate correspondence from Arnold Schwartz on the cover for *Nature*, still referring to digitalis plant illustrations. He comments on pictures of the Netherlands nobility at their formal visit to Dirk Durrer's institute with Dirk lecturing them, pointer in-hand.

There's a brief note included, a hand-written note from the desk of Margie Burchell, dated May 25th to AnneMarie, which speaks of getting her garden and flowers in the earth for the forthcoming spring.

May 1985. Howard sends a Dutch postcard with a picture of a windmill addressed to both Fritz and AnneMarie. I can't determine the date, but it must have been about May, '85, suggesting that they stay at the Holiday Inn at Palo Alto, as recommended by the contact, Dr. Harrison, Head of Cardiology, and Dr. Swerdlow.

June 20, 1985, typewritten letter from Burchell to one of the lay editors of the Journal of the American Medical Association written on University of Minnesota stationery about a cover story for the JAMA issue that will contain the reproduction of the Esther Heins watercolor of *digitalis purpurea* and the effects of herbicide. He complains that his story has not been heard and he would like to let it rest for a week or so with reediting, but sends it off, "hoping you will find it satisfactory, conforming to the format suggested and within the limit set for length." He enclosed a simple illustration, perhaps his personal drawing, that he hopes they would think worth including as an indented figure accompanying the first paragraph of the article. He also sent a copyright release about the story of the herbicide effect, as well as a photograph of his favorite patch of *digitalis* growing wild in southern Minnesota. Their joint? article is short, five pages, typewritten, starting out with William Withering's preface from his classic monograph "An account of the foxglove and some of its medical uses," dated July 5, 1785. Presumably this is going to be in a 200th anniversary recognition of that event with the watercolor on the cover and in which he refers to the deep botanical knowledge that Withering displayed in his article and how he had

pinpointed the foxglove as the active ingredient in the herbal nostrum prepared by “Old Lady Hutton.” He speaks of the animosity between Withering and Erasmus Darwin, in efforts to gain priority about the use of digitalis in dropsy.

They go on to discuss other illustrations of digitalis throughout history. The introduction of digitalis to America, in the gardens of Philadelphia by the mid-18th century, Currently prescribed digoxin, derived from digitalis linata, a perennial plant which is smaller than the classical digitalis purpurea. The word “digitalis” apparently derived from “digits” referred to by Shakespeare while mentioning the fingers ? in the release that Ophelia wore in her drowning.

The origin of foxglove is obscure. He speculates about the future use of digitalis and “doubts that it will be abandoned for the control of rate with atrial fibrillation, but its value in heart failure with regular rhythm remains debatable. “The callous and injudicious or malevolent use of digitalis should be and is on the decrease.” And he lists all the conditions in which it has been used but is no longer used (happily).

Apparently the daughter of the artist in their correspondence about digitalis is associate dean and professor of pediatrics at the University of Arizona.

June 12, 1985. Very quickly we have another lengthy hand-written letter from Howard to Frits, acknowledging and thanking for the photographs. They speak of a book and comments on the book by Dr. Van Dam, but I’m not sure what book they are talking about. He indicates that he wrote an editorial commentary on medical eponyms, presumably published in Circulation. I’m not familiar with it.

He refers to the appearance of a book by Josephson on sudden death.

He refers to a Minneapolis paper, a clipping from an article from Devon, PA about a horse with a pacemaker now back in show events. A noisy crowd from the New Bulletin Veterinary Clinic in nearby Kennett Square was on hand to cheer on the chestnut quarter horse, which a veterinarian said was the only horse in the world with a permanent pacemaker. He was ridden by the veterinary cardiologist who had planted the pacemaker." As an afterthought, the article mentions that the variable-speed pacemaker was donated by the widow of a Pennsylvania man who had used it for two weeks before he died.

He sends another Minneapolis news article about euthanasia which makes people crazy talking about it and an article by Larry Larson, hospital coordinator in Minneapolis complaining about people dying tortured deaths from end-stage diseases. Wild animals are quickly put out of their misery. He remarks that "perhaps it is time our society and its grandiose medical profession relieve themselves of the myth of immortality." He speaks of active euthanasia being practiced in the Netherlands but only passive euthanasia in this country. And he calls for legislation. He quotes Christian Barnard at a convention of the World Euthanasia Conference in Nice in 1984. "I believe often that death is good medical treatment because it can achieve what all medical advances and technology cannot achieve today, and that is, to stop the suffering of the patient."

We have an interesting prediction for the future "even more often to contemplate is the growing population of illness-prone elderly Americans. If Medicare cuts are being proposed now, what does the future hold? Economic necessity, not humanitarian concern may require euthanasia. It is unfortunate that we will be doing the right thing for the wrong reason." Larry Larson, Minneapolis Hospital Coordinator.

Howard describes an editorial for JAMA on the foxglove illustration. The otoscope pieces mystery is solved; he bought them to send to Anne Marie for her stethoscope.

June 20th Howard to Frits letter hand-written on personal stationery, welcomes them to the United States. An apology that neither he nor Margaret are great gourmets and would not be capable of advising them intelligently on Palo Alto restaurants. He indicates he has written Donald Harrison about their visit. He thanks Frits for use of the term, “isotheric” which he had looked up to find represented average summer temperatures.

Again the talk of digitalis and a memorial issue of the famous Beringer-Manheim Drug Company in Germany featuring 200 years of digitalis therapy. About the same time, he sends them a welcoming postcard to The Netherlands hoping they had a restful flight home. And sending them a postcard picture of the University of Minnesota campus as of the 1980s presumably. The Stadium is still quite intact in its former location and Moos Tower is already built.

July 19, 1985 Typewritten letter from Frits to Howard in which Frits mentions that he is going to accompany Tom James on a flight to Japan in November. (Makes me wonder if their meeting led to Tom James to invite me to Birmingham where I gave a seminar.) And they expressed gratitude for their wonderful trip to the states, and to their son, who enjoys his stay in America.

August 6, 1985, written from the Helmholtz house in Nashota, Wisconsin. That's the summer cabin of Margaret's parents or grandparents called the Pine Lake Resort summer

home. He's working on some edited book manuscript apparently with submissions of multiple articles. He hopes the book will be frequently consulted, particularly because of the original papers by Dirk Durrer. He then asks again how close Dirk came to being a serious contender for the Nobel Prize and speculates that the problem was there were just too many contributors to that particular field. "Like Einthoven, Dirk had priority in equipment and its meticulous use and beautifully designed experiments. But I suppose others like Allen Scher and possibly many others contributed to the revolutionary advances. The main problem was, and is, there were just too many contributors to the field."

August 13, 1985. Howard, speaking of the Durrer opus they are working on through the mail with hopes that his "hours of reading, thinking and scribbling will not have been wasted." He expressed disappointment that the New England Journal turned down Frits' paper on the dual role of the human AV node.

August 22nd, 1985, another handwritten letter to Frits. These letters are a week or 10 days apart only and Howard speaks of getting a good report on his own health check at the Mayo Clinic, and that his cautionary notes to colleagues in Europe were "apparently without any good basis." (That having to do with his health.)

Now he speaks of plots for plants again at the University of Minnesota farm campus, with a corner dedicated to flowers. It's not well-organized and he indicates that on a recent visit Margaret was the first to spot foxglove, both purpurea and lanata varieties, but no tall spikes of flowers.

He speaks of an exhibit in the University library on Dutch map making and cartography from the Middle Ages to the Industrial Revolution sponsored by a local consulate of The Netherlands that he will attend and tell him about.

September 6, 1985. Handwritten note from Howard to Frits on University stationery.

Howard commends him for giving the Durrer book high priority, and reminds him of the old adage, "busy people have more time." Howard says, "I think it is true that if you need help, it is also the busiest person who can find the extra time to do an extra task."

They discuss the charge that's been made to Frits to review comparative AV conduction, which he says should be an easy task for Frits, but surely time consuming to do it right. And he suggests that one of his junior associates write the first draft, or that he could team up with Charlie Fisch in Indianapolis to produce it.

He asks, "Are you planning to add to your 'general theory and laws of behavior' (a la Einstein) discussions of the direct AV nodal in electrograms? In this area I suppose Janse could be a great help if he had the time and inclination. Do you work well with him?"

In respect to editing the Durrer volume, he asks if Frits has thought of someone else to join us as co-editor. He says he has no idea who would be the most productive worker to deal with proofs, and adding and subtracting details. He indicates he will explore this with Hein Wellens when they meet next week in Dallas.

Then Howard says that he was working hard on his presentation for the Langendorf meeting and is organizing himself for the Durrer Lecture, "a rather frightening

responsibility.” He feels pressed to return early after the meeting from Holland to the Rochester Alumni Meeting banquet.

They discuss an upcoming November meeting, a trip to Rochester by Frits. He then sends a series of photocopies of photographs of Dirk Durrer presenting information on the heart to the queen and her consort for them to consider for publication in the Durrer volume.

September 9, 1985, just three days after the last long handwritten letter and it’s another handwritten letter from Howard’s home stationery to Frits. They share happy commiserations concerning their mutual checkup exams at the Mayo Clinic, Howard saying, “One never knows what is lurking in the background.” And he says that “statistically your chances of it being so (an ok check-up) would be better than mine.”

Howard speaks of a “letter from above” and wonders if he has destroyed his reputation by creating such an instructive and amusing hoax. Let’s see if we can find out what that is, “the letter from above.”

He closes his letter with concern that he won’t be able to make the December Einthoven Symposium, and that he worries about the future of the Einthoven Foundation and Lecture and hopes that it might be administered by the University of Leiden.

September 27th is the next handwritten letter to Frits from Howard who indicates that he’s on the way to Amsterdam and he will probably beat this letter and it will be interesting to find out, he says, whether he will get to Amsterdam before this letter, to the conference that Frits is very much involved in.

He indicates that he has found the preparation of a paper on bundle branch reentry ventricular tachycardia, much more time-consuming than expected and is taking away from his preparation of the Durrer book.

October 13, 1985 from Howard to Hein, saying how pleasant it was to see him, presumably at the Dallas meeting, or maybe it was the Amsterdam meeting for the Langendorf session. Again, Howard worries that there was more dissatisfaction than was expressed, and that he might have had a part in causing it, talking about the book honoring Dirk Durrer.

He goes on to tell the editor of the volume, Hein Wellens, that Frits and he were concerned about the absence of an institutional bibliography. Also that Frits and Howard agreed on the reproduction of the 1972 and 1974 ventricular tachycardia papers from *Circulation*. And then he makes a cryptic, parenthetical remark about those papers that, "possibly there might be some repressed emotion about Dirk's name being on the 1974 paper by some people?"

He continues to discuss the book and his ideas on its organization and references. And I quote him in the letter of October 13th: "If Dirk, that is, Dirk Durrer, had written the commentaries in the present style, (his ghost) I would have had some good, hot arguments with him. But I see no reason to complain; the notations probably should be Dutch oriented and some minor bias is admissible, and of course, signed and initialed." "I thought some of your notations superb, a light list of syntax and those following the preexcitation or WPW papers."

He goes on to say, "I had some questions about priority claims, but not serious enough to make an issue of it." And then he talks about the audience for the book, and the fact that the Academy doesn't expect to make any money on it.

October 13th, again the same day, from Howard to Frits. Howard describes getting home from The Netherlands, just in time for the Mayo Alumni banquet which he found enjoyable. He was happy that his sleep cycle had not been appreciably altered by his travels. He then sent a copy to Frits of a letter sent to Hein Wellens again, and his ideas expressed he thought were presumptuous "as he is a renowned world authority which I am not!" And he asks Frits if he remembered the word he had introduced him to years ago, "picayunish" which pretty well described his objections to Hein's article or whatever it was. Howard then said he had spent time in the library on the week-end and had some ideas about the book while he was there in regard to the citation of Durrer in Index Medicus in 1950 in respect to unipolar electrocardiography. And another citation in the American Heart Journal in 1961 when Dirk mentioned the birthday of Einthoven. And he refers to the 100th anniversary of Einthoven's birth, May, 1860. The program of the Einthoven Conference being published in entirety in the American Heart Journal. "(I suspect that the publication was facilitated by Dr. Burch being the Editor and the author of one of the papers.")

They then reveal a review of a series of 14 items of discussion concerning completion of the book indexing and so forth.

I like this quote of Howard that I've heard before as he closes this letter: "I thought of holding back the letter to Hein, maybe not even sending it, but gambled that it was best to

get everything out in the open. Probably, 'honesty is the best policy' most of the time or all of the time, but candidness may not be." Regards Howard.

He writes a thank you letter en route from Minneapolis to Chicago on the plane and closes it by postscripts saying he shall never forget the Rothschild, presumably referring to a wine he had in Amsterdam.

19th October, 1985. (Goodness what an intense correspondence.) Howard to Frits, he tells that he has a print-out of the computer search of the National Library of Medicine, words that we use for the bibliography of the Durrer book. There were 163 entries under Durrer in the years 1965-1985. There were 11 entries in the Cumulative Index Medicus between '60 & '64 with a void from '63 and '64, "which intrigued me whether there was a fault in the indexing system those years, or a silent period for the laboratory?"

He says that the bibliography ----- of the over expanding involvement of Dirk's department with cardiological interests worldwide. echocardiography scanning, stimulation and the great contributions of Durrer to Dutch science.

Again he worries about his being critical in word and deed "probably I had some unconscious misgivings about the letter to Hein, as well as conscious worries, as I found it unposted on my desk a couple of days ago mixed in with other papers. After some renewed vacillation, I put it in the mail."

He describes a visit of J. Willis Hirst to Minneapolis in '85 (I wasn't aware of that myself.)

He mentions a second edition of Hurst's book on heart disease is just out. He found out

from Willis Hurst, who was there for the Jessie Edwards lecture, that the indexing for his book was done on a contract rather than by the publisher. And the person who did it was the brother of Tom James who lives in New York and according to Hurst is the best indexer in the field. This might be something that I should keep in mind, although that's almost 30 years ago.

He then discusses recommendations to divide the paper into early, middle, and late periods of electrophysiology. He writes his own editorial comment all on the papers of Durrer. "A particular paper in 1974 on ventricular tachycardia in *Circulation*: 'this paper reflects a superb expertise developed in the University of Amsterdam laboratory, and why, was an experience of two decades, it was logical to extend the program of electrostimulation technique to patients with ventricular tachycardia during acute myocardial infarction. There were ethical questions raised around the world. These were not unexpected and they were ably answered.'" Signed, the Editors.

He goes on to say that both the papers of '72 and '74 of Durrer are good ones to include for a seminar on educational ethics to illustrate the role of institutional committees on human experiments.

October 26, Only a week later, is another handwritten letter in which he says he has intended to keep a steady flow of conversational letters flowing, stimulated by the regular replies of Frits. Instead of aforementioned exchanges, commiserating about the fact that their communications took four or five days. He indicates that the contribution of one of the authors will not make sense before long because they refer to a period in the '70s with

the MIRUs in the United States, NIH projects. And a discussion of arrhythmias having equal attention to hemodynamic features. "At that time the human volunteer and ethics committees were not kindly disposed toward invasive electrophysiologic studies and this could explain some of the criticisms both from clinicians and physiologists (envious) of the Amsterdam 1974 study." Apparently Durrer's '72 and '74 papers created some ethical concerns in this country.

They go on to talk about the bibliography and the references. He assures Frits that a connecting sentence in his statement should provide no trouble in fixing up the problem of context.

October 26th 1985 letter, he goes on to worry about how closely he should copy-edit for typos, or rely on the publishers' proofreaders. He refers Frits to the London Illustrated News Magazine article about the wreck of the Amsterdam in the 17th Century off the coast of England.

November 2nd. A letter to Michael (not sure who that is right now) has to do with the book obviously. Pursuing the editor here is the typical tactful Burchell comment: "I wonder if the language in your first sentence is quite like your thinking. As written, I do not believe it is accurate – is it a really frequently quoted or cited paper? Can you document this from the citation index or for a series of papers. The journal is not very well-known and from the semantic angle one can't quote a paper without having read it, theoretically at least." Then he goes into more detail and criticisms of the article by Michael, whoever that is. He comments on the comment of Michael "your comment is somewhat akin to those of another dear friend in past years, Hans Hecht, who said of one of the papers from the Wolfson Laboratory, "In general, the paper seems to have received respectful attention, but I find

that few are taking the trouble to read it, and even less attempted to digest the information presented.” Howard goes on to say, “Such does not get high marks for professional diplomacy or academic strategy.”

On November 22nd, another handwritten letter from Howard to Frits acknowledging a postcard from Frits from Japan. They speak of a recent visit of Frits with the Burchells en route to Japan. On his visit Frits had had a work-up at the Mayo Clinic and he had some question about the placement of electrodes for his electrocardiogram there. And Howard suggested that Frits send a note to him or to Ralph Smith about it. “Any attempts to figure out the issue, they have used an extra lead on occasion I believe, but you would have recognized this. The basic analyses are still determined from the spatial vectors as far as I know.” (Smith took only XYZ Frank leads, as far as I know, which may not have been familiar to Frits. Hb)

They speak of a new journal on applied cardiology headed by Richard Bing and Suzanne Knoebel as editors. And then he still worries about the bibliography to the Durrer book, whether it should be author-indexed as well as subject-indexed.

December 6, 1985 Howard thanks Frits for his Western Union mailgram on his birthday, (which as I recall is November 29th), which was celebrated in the Wisconsin home of his in-laws. Caught in a snowstorm on the way back, they had to hole up in a Wisconsin motel. And he talks about the whale expedition in Japan and Tom James’ apparent dissection of the AV node.

December 26th. A nice discussion of Josephus? Durrer, and whether the British Heart Journal would accept an article he had submitted, and discussion of the defense of his

thesis, for which Howard would need to wear an academic robe. He regrets that there are no photographs of Frits officially changing diapers of his grandchildren.

31st of December, 1985. On plain bond paper, a fax photo of a soaring bird, he writes: Dear Frits, "Just a note to keep the communication channels open and to hope you've had a pleasant beginning of 1986." He suggests that his lecture coming up in February will in part be a promotional one for the book, and their hope to resurrect some colored diagrams of excitation made by Durrer. He mentioned that he's flattered by the pressures to return to Stanford as a consultant in spring. He talks about a talking book about Winston Churchill's triumph and tragedy, talking about the Holland Campaign. Again he refers to a cover logo of digitalis in which he assured the spike of flowers is more like lanata than purpura but the leaves were more fitting to purpura. The dialogue on digitalis continues forever.

Date? Frits gets a notice from the Institute for Scientific Information that the 1970 paper by Dirk Durrer published in Circulation qualifies as a citation classic and asks Howard to write a 500-word commentary on the paper to be published in Current Contents. This is from Eugene Garfield of the Institute for Scientific Information.

In handwriting, on the bottom of a letter, he has lists of three other classic citations including from Blackburn, Earl Wood, and Callahan in answer to his question, can the thing become a classic in our own time?

February 14, 1986 Howard answers Garfield and finds it very interesting about the citation classic since he was the one who encouraged Dirk Durrer in Circulation. He was happy to write the 500-word commentary on the Durrer 1970 paper, and even proposed that he provide a photograph from 1970 on the opening of the All- University Institute with the Queen and the Burgomaster and the President of the University. And goes on to what is nostalgic about Durrer's visit to his home, and the contents of the paper was given for the first time in his George Fahr Lecture at the University of Minnesota, (which unfortunately I didn't attend.)

"The paper also represents the acme of that research technique, which brought Durrer to international attention in the 1950s; the multiple electrode intramural needle." He goes on to say that the decade of the 1970s was associated with sad events, "some bitterness and dissention between Durrer and his young, brilliant associates, with some separating, to go their independent ways. "This is confidential as I'm sure you will have perceived though no secret."

"The early work of the 1950s in the Durrer Laboratory quickly took two directions; one pointed toward an understanding of the mechanics of the electrocardiogram per se; the other toward the explorations of arrhythmias. In the latter area, there was the meteorite career of Heins Wellens." In a post script to this director of the Institute for Scientific Information he asks, "In the study of citation frequency, how does ISI handle the self-citations? Some prolific authors are notorious for citing references to their past papers. For example, 60 references of which 30 are to himself or herself. From the point of view of influence analysis, I expect such are deleted."

January 23, 1986A long, handwritten letter to Frits from Howard. They again talk about the proof of the Durrer book. "It is hard to believe it will be ready so soon, but in retrospect it is quite a few weeks since we initiated the project. I suppose our efforts and accomplishments are peanuts compared to the rate of planning and building of corporations or armies."

He discusses how he is still working on the main points and slides for the Durrer Lecture, and reviewing Frits' "special love," the function of the AV node and particularly in respect to the dual pathway gap phenomena, echoes, reciprocal history, and find it impatiently difficult to have confidence in assigning exact priorities.

He's been reading a book on the art of public speaking indicating that he worries about presenting too many items. ---- discuss in reviewing Durrer's papers ----- concerned that his wife Ina might not enjoy that review because there might be administrative, political, personal items that would be sensitive.

Part VIII.

4th of February, 1986 from Howard to Frits, a handwritten letter containing a neat photocopy of an electrocardiogram of lead one of a killer whale. Howard asks Frits detailed questions about the characteristics of their recording equipment for the whale. The heart rate is apparently 66, could it be 33? And “the contours of the repolarization potentials are surprising. The T wave looks like a human’s, the PR interval looks to be .020 second, the QRS is upright, about .10 second, the T wave has the same contour as the QRS and is some 10 millivolts deep, indeed a very strange looking contour.”

He acknowledges that he expects to receive the proof of their book, the Durrer book, in the next days. They speak of their upcoming visit and with some embarrassment he mentions “it would be helpful to know how much of my expense will be covered” (assuming the cost of one business class ticket and the hotel expenses).

He speaks glowingly of the books on tape versions of Churchill’s series and says that Richard Green, who reads Churchill’s books, is excellent. He indicates he is spending a great deal of time thinking about his upcoming Durrer lecture, with considerable rereading of Durrer’s papers, complaining that he forgets details quickly. His time and preparation “can be roughly classified as joy 50%, ennui 30%, a fugue state 10%, and panic 10%. (This is in preparation for one of the major lectures of his life.)

Otherwise, he is writing a biographic sketch on Earl Wood and asks Frits for ideas or special incidents that would be worth mentioning. They share a strange cartoon labeled

the Maastricht Laboratory, titled “Between the devil and the deep blue sea” and has something to do with the Wolfe-Parkinson-White Syndrome. It’s sort of a parody of an electrophysiological study of a patient with WPW and at one particular point there is instruction from Dr. Burchell in a gown with a sharp-pointed pencil showing where to cut the Kent Bundle. Interesting but a little obscure. Somebody else in the scene is saying, ‘hurry up.’

There’s another illustration with histograms of the frequency of citation during five year periods of the 1964 classic paper by Durrer and colleagues on pattern recognition, the role of premature beats, Durrer school and Willen schools, a ’67 publication, revived by Durrer and Van Dam in the 1970s. They have a number of citations in a five-year period going up to these three classic papers of Durrer.

It looks like Howard plotted this graph himself. Apparently the data were obtained from the Science citation index, There is another histogram of papers cited more than five times in which the first author was Durrer. He’s obviously preparing these arcane statistics for his momentous Durrer Lecture.

There is another graphic of selected papers with citation frequency on AV conduction advances in the decade ’65-’74. So he’s attempting to reduce a large amount of information about Durrer’s papers into three dramatic graphs.

He has a cartoon of Durrer quoting Eintoven and Bach in German and I don’t get the points of any of the quotations.

There’s a photocopy of the first page of a paper on AV rhythm by Paul Dudley White in Boston in 1915 from the Archives of Internal Medicine, vol 16. Then he has a copy of the famous photo of Durrer lecturing to the King and Queen of The Netherlands and showing a

graphic of a number of his papers in Index Medicus, starting with a low level consistency between 1950 and 1960, a sharp rise in papers in the early 1960s, a gradual and steady rise between 1960 and 1970, reaching a continuing elevated rate between 1970 and 1980.

He has a slide of an aerial view of Rotterdam in 1940 with Dirk Durrer in the corner, and another famous photograph of the King and Queen looking at a diagram of the heart displayed by Durrer and a copy of a February 20, 1986 letter to the president of the Institute for Scientific Information that publishes the citation classics for Current Contents, suggesting coordination with the Royal Netherlands Academy of Arts and Sciences in giving notice of the publication of the Durrer papers, but finally deciding that the format was inappropriate.

Handwritten letter of February 23, 1986, to Frits contains the same copy of the electrocardiogram of the killer whale, again reminding Frits that if they were to publish the cardiogram they have to give the characteristics of their recorder, still asking about the T wave deflection that needs to be elucidated because “as you know, one can get deflections like this from movement of the electrodes and even movement of electrodes from the undulations of the arterial pulse ----“

Burchell acknowledged the recent visit of an editor with the galley proof of the Durrer book, with whom he had spent some time admiring the thoroughness and competence of the people in the publication office. With the editor he has sent back an outline of his plan for the Durrer Lecture and says “Does it make you nervous, too? Anyway I shall keep working on it.”

He also sent back acknowledgments fitting for a general text in America, but about which he is insecure on appropriateness for European publication. He complains that the illustrations could have been better, and numerous other details about illustrations in the text.

Handwritten letter of March 1st, to which he attaches a reprint of a letter to the Editor of the Lancet of January 11, 1986, about comparative obesity in North America and The Netherlands, showing two parallel sine curves based on distributiona of body mass index in representative samples of the U.S. and Holland, white, civilian, non-institutionalized, adult populations. Using the index of 30, a Dutch sample over age 20, had 3.8% for men and 5.9% for women compared to 12% for both in the United States. It is prepared by the Department of Human Nutrition from Wangenengen, Netherlands, the same department where Daan Kromhout is now a member. "Clearly, obesity is a more serious health problem in the USA than it is in The Netherlands. This is true even without adjustment for socio-economic status. In both countries, the subjects of low socio-economic status run the highest risk of obesity. Within this stratum, the differences seen in the figures might be even larger. The paper quotes Jeffery, Folsom and Luepker, and others in the Minnesota Heart Survey.

He acknowledges the generous travel allowances for business class for him and Margaret both to travel to the Durrer Lecture. He is "aging in the wood" his first draft of the Lecture, for a week at least, "as such a plan gives a fresh look at one's labors and appreciation of possible errors in facts and meanings."

March 10th, Howard to Fritx, written on personal stationery referring to two recent telephone calls. "Right now, I am really depressed after reading over my first draft of the Durrer Lecture. I had purposely put it aside for about 10 days and I was shocked to find how much work is needed. ---- which is both fun and hard work."

(The following humble comment from the individual who headed cardiology for decades at the Mayo Clinic, then heading cardiology at Minnesota, amazes me.) "I know I have a loyal friend in you, but maybe you have qualms at times concerning how well I shall perform in May!" (Insecurity in the giants of medicine!!!)

April 4, 1986 letter, handwritten from Stanford in his new regular consultation there in the Spring. He speaks of the many administrative problems in the Stanford Medical School and in the Division of Cardiology, which can be more easily identified than solutions offered. He said he wished he had some of Frits' administrative insight.

He discusses the work of Michael Franz and the mechanical restitution curves in relation to the monophasic action potentials recorded with a special probing catheter. "The records are beautiful but I am 'over my head' when interpretations are attempted. I shall eventually be asking your opinion about the meaning of the findings and whether they fill in gaps in our knowledge or are likely to advance understanding of the contractual mechanism relative to the membrane action potential and calcium fluxes. I know this has long been a special interest of yours."

April 15th, handwritten from home. Howard is still fretting over his up-coming Durrer Lecture. His friend, Ray Pruitt, read it and made “a few minor suggestions in syntax.” He was pleased that Pruitt approved it in general and expects to get the speech back from the word processor any moment. He intends to heed Ray Pruitt’s advice, “don’t lengthen it.”

He has reviewed all the slides and finds many of them poor and they are discarded, “and this hurt both my ego and my purse.” He complains that the University of MN graphics is charging \$2-\$20 for each slide. He had done a tremendous amount of research and correspondence with others to be sure he was accurately evaluating Dirk Durrer’s work, particularly in regard to the Durrer Needle.

April 1986 in a mysterious postscript Howard says: “I am aghast at what our government is doing; I suppose one could think it justified, but will it be good in the long run?” (What was our government doing on April 15, 1986?)

The next letter is April 23rd, ten days later. Happy over the proceedings of the book and happy with the cover indicating how Dirk’s picture has a very natural expression and in a typical sort of Howard statement he says, “Maybe some would have liked to see him look a little happier.” “My commendations on the results of all your effort.”

He offers a friendly ear to Frits’s concerns about complications and the increasing number of his enemies but doubting whether Frits could make any enemies. “It would be entirely

alien to your nature and administrative talent. I expect you mean by enemies possibly a few uncooperative people to which the Institute must relate.”

Howard is bothered that his Stanford consultation involves so many questions about administrative problems in which he doesn't feel competent compared to his abilities in clinical problems.

He asks what personal references should he talk about in his Introduction to the Durrer Lecture in terms of acknowledging the Institute director and the Durrer family.

A typewritten letter from Frits to Burchell from the University Cardiology Institute 1986, a formal invitation. “Her Royal Highness Princess Juliana will unveil a monument designed by the sculpture Vicien de Arend and erected in honor of Professor Dirk Durrer, etc. It is my pleasure to invite you in the name of Mrs. George to join her at her home.”

From Howard to Frits on May 4th, still before the Durrer Lecture.

On May 12th he writes another letter still talking about other people reading his Lecture and commenting on it, encouraging him in it, but each having minor suggestions about words and phrases and some worries “whether my comments often were sometimes too cryptic or too short.” This obviously consumed his life for many, many months. Again, he asked for instructions on how to address the dignitaries at the beginning of the speech and again, his insecurity about the whole comes forward.

(I am beginning to realize that Howard was never an outstanding lecturer in his own mind and perhaps, in fact. His beauty was as editor and master of cardiac rounds.) “By this time you would expect that I would have settled on the exact plan of delivery, how much to use the text, and how much to speak free of the text; but I really have not got it crystalized. I

wonder if it would be helpful if I got someone knowledgeable in the field to use the light pointer from the front row for me. [He is really bugged by this talk!]

He goes on to say that Margaret is worried whether she will have the proper clothes for all these events, but he has confidence in her good taste. He closes with passing thoughts. "I have had a year and a half to prepare a single lecture. Roosevelt mobilized a whole nation with massive industrial developments in less time than that. And Churchill did even more when he came to power for the Battle of Britain!"

"This trip will be more nostalgic and touched with emotional depths than I had realized." And then details: "Is the Morrison Hodges registration ok?" "Will he be invited to the Durrer unveiling?"

Attached to this letter is a marvelous black and white photograph of the young and vigorous Dirk Durrer in a white gown with the casual sports-jacketed Howard Burchell in a short hair cut and with a fluffy handkerchief in his jacket pocket, just outside Durrer's laboratory.

The Archive contains a whole packet of reprints and letters having to do with the Dirk Durrer Lecture and ceremonial celebration. A reprint of an editorial in the International Journal of Cardiology, vol 6, 1984, 755-756. Dirk Durrer, MD, a personal American Tribute. Is a beautifully written letter of commemoration by Howard Burchell.

June 4, 1986 letter with a note of just "Bob," I'm not sure who this is, complemented by the request to print the Durrer Lecture congratulating Dr. Dunning for his printing of the

Lecture and the selected illustrations that came out so well, suggesting parts that could be removed for shortening it. Referring to the paragraph on ethics in the Helsinki Declaration that could be cut out “though it has value for the world community and one could add a couple of items of that Declaration, short ones.

He writes Dr. Dunning of the University of Amsterdam on June 4th, appreciating the latter’s role in supporting Howard as candidate for the Durrer Lecture, and congratulating him on his publication. “I was pleased that apparently the Lecture was a success. Sometimes evidence of work in preparation, earnestness and a few facts will win an audience in the absence of fluency. One wonders what the young scientific physician thought. I expect that if there were routine evaluation sheets by the attendees, there would be at least 2-3 caustic comments. There would be in this country! Some who might have come for something new or dramatic or entertaining.”

Letter from Dunning to Burchell of June 13th thanking him for giving the Durrer Lecture “in more respects you rose to the occasion and on behalf of my staff too I want to thank you for that. Apart from a great tribute to Durrer, it is a critical analysis of scientific dynamics which makes it of interest to readers even if some details need to be changed with the publication. With warmest thanks, Yours sincerely, A.J. Dunning (with a copy to Frits).”

There’s a CV on Dr. Burchell

June 7th with a handwritten to Frits when Howard is back home, and again he bemoans humbly(excessively?). “The Lecture was laboriously tailored for The Amsterdam occasion

and I do not know whether cardiology would be served helpfully or not by having it published. I have written Dr. Dunning my opinion and I shall be dependent on your advice and follow your instruction.”

He indicates that he tipped the typist \$50 for having typed the manuscript over several times.

He then describes his procto and colonic x-rays as new experiences and was happy for the negative reports. Apparently they had some digestive upset when he was in The Netherlands. They even speculated whether he might have had a small bowel penetration from a salmon steak he had eaten. Then he speculates what would have happened if the situation had blossomed into a real peritonitis. Apparently all this happened in Amsterdam. If disabled, he speculates: “Would you have read my Lecture or tried to get Ray Pruitt to do it? Or just canceled it. Who would have had my favored position at dinner at Her Royal Highness’ side?” (Howard had nice flights of fantasy)

He announces he’s going to give a July, 1986 talk at the Mayo Clinic History of Medicine Society on “digitalis: fact and folly: from herbal to high-tech.” So much has been done with the bicentennial of digitalis he’s worried about whether he will have anything new to say.

June 21, 1986, handwritten on university stationery from Howard to Frits promising his weekly report from St. Paul on the first day of summer. Bragging about Becky having a little baby girl. He’s sending Frits a full page picture of an American Saturn rocket with the Utrecht cathedral in the background. I have no idea why this is so contrived. Brought to his attention by “a young doctor originally from Lithuania and Germany.” (Presumably

Claus Pierach) Again some discussion of the digitalis plant and the abundant growth of *D. linnata* nearby that had escaped from a nursery garden. He's looking for a new twist on a talk he has to give on digitalis. "I shall be presumptuous trying to think like an historian not a clinician. Don't expect anyone to be fooled." He speaks of Lindsey Miles, presumably Becky's baby they had named after Margaret's mother and Andres' mother's maiden name. Again their letters are overlapping.

Frits sends a bill from the Clinic for 190 Dutch florins, or \$79 for his extensive work-up and colonoscopy there!

Handwritten letter of the 20th of July from Frits to Howard, writing about two papers he has in preparation on concealed conduction and other issues and he says, "If possible just believe me, it is true." But he adds, "Please don't spare me your criticism. I know you won't and let me know what you think of it."

A letter from Howard at the Wisconsin summer residence from July 15, 1986, addressed to both Frits and Anne Marie. Still talking about editing of the publication of the Durrer manuscript, expressing contentment that his historical dissertation about foxglove was well-received and that someone came up and told him about the bacterial flora in the gut containing organisms that can break the double bond in the lactone ring inactivating the digoxin molecule. In a postscript he says he's learning to live with his own bowel dysfunction.

A letter again from the summer resort, July 21, 1986. He describes his history lecture at the Mayo Clinic using two projectors, shifting back and forth, talking about the Dutch improvement on the genetics of the foxglove and Darwin's mention of the foxglove and an example of how plant species could be cultivated and a favorable transmutation to a desired quality could be obtained.

He's asking for advice on the gift to the doctor that took care of his episode in Amsterdam. He comments on Frits doing his historical text on cardiac glycosides 1785-1985, published by Springer in 1986.

He complains to Frits about his loss of hearing in high tone range. A "sexual discrimination by airmen so well but not women."

August 12, 1986 from Howard to Frits, handwritten on his return from Wisconsin. He indicates he likes Frits' manuscript on the effect of pacing on AV conduction. He likes Frits' article. "I like it and was not alienated by analogy of there being a nodal rhythm modulated by the atrial fibrillation in the situation produced. Years ago to be provocative, I remember the question posed, 'was MacKenzie really wrong?' in stating that a nodal rhythm might exist with atrial fibrillation. However, the interpretation of what the atria were doing was different from MacKenzie's early views."

He goes on to talk about arrhythmias in sick sinus syndrome in which there may be atrial flutter. He goes on to a complex discussion of the effect of digitalis on such rhythms. "Just a few random thoughts." Then he goes on to flatter in his usual low-key way, "If I were an editor I would like to have it in my journal."

Again he is talking about publication of the Durrer Lecture with Dr. Anderson, an editor in Pittsburgh.

A group of letters type-written, clipped together, beginning August 22nd to Frits from Howard. "I am enclosing a manuscript on the effect of right ventricular pacing on the antegrad atrial ventricular conduction in patients with atrial fibrillation." Wow.

Again he says, "I like it." But he's made marginal comments and suggestions for minor changes in style "which reflect my musings on the problem raised, or possible items for conversation at a future time. Not corrections."

"My main reason for liking it is that it treats the junctional conduction mechanism as a much more complicated process than sometimes done, actually, if you will, as a more biological enigma than an electrical circuitry puzzle."

This is pretty heavy stuff but it has to do with their long-term discussions of conduction issues so I'm going to quote it. "I have asked Dr. Anderson and Dr. Janse in the past whether possibly the AV node-His conduction was too closely thought of as analogous to axon function, and how many cells in sequence might be involved in nodal-His conduction. They did not have an answer, being very frank and honest about it, but I do not know whether they thought the question had any relevance or merit."

He reflects on McKenzie being denigrated about his thinking of atrial fibrillation as a nodal rhythm. "Was he necessarily completely wrong? Could there indeed be conceptually an upper His pacemaker modulated by atrial inputs through the node or local electronic influences?" (At that time, Howard was probably not really serious.) He goes on in great

detail about these issues and the experiments of Gordon Moe, with many details on many pages suggestions for Frits' manuscript. Many substantive but others stylistic, such as "The word 'considerably' is looked upon as very imprecise and sometimes by some writers with derision." Many detailed and helpful suggestions.

He describes waiting for the July issue of the British Heart Journal and the reading of Frits' editorial before reading the report of Rawles-Rowland saying, "I do not believe that R & R differ radically from your views as inferred and some would think that you are more bellicose in the condemnation of their work than necessary. I like the strong adversary approach. But could you explain the R & R data and point out flaws in their conclusions more kindly and possibly more helpfully to the reader?"

He goes on to a very, very careful dissection of the two conflicting opinions and papers. "I do not believe you have explained the hemodynamic Doppler findings as well as you might have. I do not like the term you have used 'continuous post vector systolic potentiation' very well. Would it be better as 'repetitive early deep potentiation' or something like that?" This long, long, long, typewritten paper on university stationery typed by a secretary is perhaps the most detailed interchange of knowledge and comment, critique, editorializing of their whole correspondence.

He thinks that R & R's choice of a title was a red flag and that the authors wish to be provocative, "and if so, they were successful in provoking you (Frits) into making the

strong invective concerning their errors, although their data did not necessarily conflict with your views as I have interpreted them as much as you implied.”

Then he frets a bit about lack of getting records on the whale electrocardiogram and the data he was expecting, and he indicates on page 6 of this long letter “I have received a copy of the biography of Paul White by Oglesby Paul this week. It’s publication was tactical in side with the Congress so that it will be available and advertised I suspect in Washington. I shall be interested in your reaction when you ever can find time to read it.”

He comments on the recent article in the New England Journal of Medicine, a paper by Cooper on the history of electrocardiography, “which I think a scholarly study but it does denigrate Einthoven’s role in the development of the string galvanometer.” He signs it “sincerely” and then signs in his handwriting, “and with love, Howard.” At the conclusion of an epic 7-page, typewritten letter to Frits.

September 6, 1986 handwritten Howard to Frits. Now they’re deep into the AV node.

“I have struggled for years to visualize what is happening in the AV node and specialized conducting cells; but it has continued to elude me and even more so as my problem in expressing in any language what might be happening.”

A lovely statement here. “I am having a little trouble understanding Dick Langendorf’s critique (but think I understand why I don’t understand).”

Part VIII

Howard to Fritz, September 30, 1986. Handwritten letter, with a beautiful photo of a Dutch windmill along a canal. He sends along a draft of an "Einthoven Co-Inventor" essay, that we've heard about before and we'll probably hear about again, presumably addressing the issue of whether Einthoven was the sole or the first inventor of the string galvanometer which led to the electrocardiogram. He says that it needs polishing and he would be grateful to have Snellen's opinion of it.

He refers to a very confidential letter that he's keeping under lock and key from Frits to Willie R. that he indicates will probably stay there of a very troubling manner apparently to Frits. Some major blow in his professional life, a Society election. Howard says gently, "I am sure you will never recover completely from the blow but will make adjustments to the situation. The situation in The Netherlands will be difficult."

(Apparently this is something that I knew about, but I still haven't understood.)

He goes on to say, "Last week we were out at Dr. Ed Kaplan's (invited to dinner) with Professor Pyorala of Finland and Henry Blackburn and I brought up the 'election' casually. They were surprised at the turn of events saying it was primarily an inter-European affair. Henry said that the epidemiologists were not involved nor were Americans to his knowledge. Maybe they knew more than they were telling, but I do not believe they understood what took place." (Pierach or Kaplan for details)

Howard then speaks about Ray Pruitt's loss of his wife, Lil, and his disconsolate status since.

Then he goes on to talk about the Einthoven piece and reviewing the August Waller saga. "I ran across again Waller's observations on the AV interval from the electrocardiograms. He sticks to his own rules about aVL-V1 for the deflections and I cause a crimping showing the durations for various animals (I don't understand this)."

He encloses a clipping of a May 31, 1913 article from The Lancet by Waller on electrical action of the human heart that he photocopied from the library in which he talks about a normal AV interval from .12 - .15 second that .10th second is rather short but to be expected if conduction were "facilitated," in which he finds the AV interval prolonged despite a higher heart rate in animals being asphyxiated or in severe exertion in human subject.(check for detail)

A letter of October 10, handwritten to Bill Roberts, editor of the American Journal of Cardiology and labeled carefully, "confidential." "The unexpected assertions of Dr. Brugada continue to prey upon my mind. It is almost inconceivable that he would not know of the frequent, seemingly routine, citation of the major investigations and papers on arrhythmias. Particularly ominous perhaps is the omission of acknowledgement of the Dutch workers, particularly Dr. Allesie in his own university in the Department of Physiology. Dr. Allesie's dissertation at Maastricht in 1977 dealt extensively with the Mayer observations with reproduction of the important figures. He is regarded as one of the world's authorities on the theoretical and experimental circus movements. His thesis

was entitled 'Circulating excitation in the heart' and Hein must be familiar with it. What goes on in Maastricht?

Dr. Brugada has been very 'productive' the last few years almost 'hyper,' but if his essay should appear on Mayer, his reputation would plummet in electrophysiologic circles over the world. I think now the paper should be rejected." Signed, Howard.

And he writes a letter on the back of that to Frits, also in handwriting, "confidential," saying that he's sending a copy of the note that he sent to the editor who had sent Burchell Brugada's manuscript concerning the historic importance of Alfred Mayer stating that "practically nothing had been credited to him. My initial review led me to recommend only definitive revisions with additional references. I am breaking protocol in this act, but do so believing 1) that you are discrete; 2) the information might be worthwhile as background in your position as director of the inter-university cardiac institute; 3) you are a close friend, as I am, of Hein Wellens, who is placed in a possibly uncomfortable position. As you know Dr. Brugada has been a co-author with Hein on literally dozens of papers; and 4) If I am making a mountain of a mole hill, or my communication is seen, no harm should ensue, at least nothing major that I can foresee." Sincerely, Howard.

And he speaks of Frits' recent visit to Israel.

(These are fairly important issues that remain so far mysteries to me. We can't write about them until I understand them.hb)

We do have Howard's typed manuscript here, on Einthoven. It's entitled, "Did Einthoven invent a string galvanometer? Yes!" He's asking Frits what to do with the article, suggesting that he will add a photograph of Einthoven and his co-workers in his laboratory at around 1909. (It was subsequently published so we don't need to mount this copy)

He starts out by indicating that it was the pioneering work of August Waller published in 1887 on the cardiac potentials being recorded that aroused Einthoven's interest, after which Einthoven devoted three decades perfecting methods to study the potentials with high fidelity. His editorial was occasioned by a 1986 article by J. T. Cooper, called "Electrocardiography 100 years ago" in the New England Journal of Medicine, vol 315, 461-463, in which he suggested that Einthoven did not invent the string galvanometer with the inference that Einthoven did not give proper priority and credit to Ader. Howard points out that is not a new controversy and that most of it centers around the use of the term "invention" or "invent" a little loosely. But Howard argues for the use of the word "invent" and lists as his definition "when something is done in a new and effective way." He concludes the article with the following paragraph:

"Einthoven's 'invention,' the instrument that he bequeathed to us, endures. If one needed a high fidelity, high sensitivity galvanometer with nearly perfectly square wave response over a remarkable frequency range, (perhaps to celebrate a diamond jubilee of the beginnings of electrocardiography in American hospitals), one could confidentially take an ancient string apparatus off the shelf and expect it to work superbly."

November 9, 1986, a handwritten letter from Howard to Frits. He indicates that he didn't expect that the editors of the New England Journal of Medicine would run to print his editorial on Einthoven.

He comments on a reprint Frits had sent him on "deterministic model of the canine atrial ventricular node as a periodically perturbed biological oscillator." Howard says: "I must profess that I do not understand it but intend to try again. I wish I had a better background in physics and cell biology. I have the notion that I can grasp the concepts but not the scientific reasoning. Maybe you or Allen could lead me through it. I am happy to be a believer."

He thanks him for the beautiful reproduction of the ECG on Mr. B.M. Beluga, a beautiful white whale. He says "I do not have a satisfactory explanation for the ST segment level and contour. When the group here had an intravenous line in it would have been great to put in a wire and get an intra-cardiac record."

And he apologizes for plaguing him with yet another experiment that should be repeated. The experiment of Mayer on the jellyfish. "The first rung experiments could be done with electrograms. It would really be worthwhile. I do not believe it has been done.

And he returns to the sensitive political issue: "I hope the election episode at the Congress has faded into past." That must reflect on the emotional issue that he considered in the recent long letter.

Attached is a news article and photograph about the beluga whale at the Minnesota Zoo who is being treated for infected ulcers on his left flank. And he autographs it for B.M. Beluga. "To my dear distant Dutch friend, Sir Professor Frits Meijler." Dated 1986.

The next handwritten letter of November 7, 1986 has attached to it another well-known photograph of Einthoven in his laboratory including the picture of George Fahr with him, George Fahr the native Minnesotan. It's a handwritten letter to Frits from his home stationery. They continue to discuss the electrocardiogram of whales and communicating with a Dr. Leonard and makes a suggestion that "one could at least mark the tracings for the time of the expirations through the blow hole." (In other words, to determine the respiratory modulation of the heart rate and rhythm.)

He enclosed an editorial he wrote for a general practitioner journal and they speak in commiseration over Henry Neufeldt's having metastatic cancer and avoiding all his friends.

He indicates that he's had good reactions to the Einthoven paper, but he's not pushed to get it published. "As the agriculturalists say, I can allow it to lie fallow for a while."

(A letter from October 15th taken it out of turn in which they are talking about a grenade thrown into a group at the Wall, presumably that's the Praying Wall in Israel, at the time of the visit of Prince Bernard and Princess Juliana and he is expecting that everyone must have felt very tense, and he welcomes him back home.)

He says that the mystery over the origin of the picture of 'old mother Hutton and Withering is now largely solved.' Whatever that was. And he indicates that Frits now has another believer in Dennis, another convert, who is credulous of the oscillator hypotheses. He wants to add a quotation from John Burnett to the Einthoven paper. "The

electrocardiograph was probably the most sophisticated scientific instrument in existence when it was first invented.”

He attaches a news article about Princess Juliana and Prince Bernard in Tel Aviv as guests of the Jewish National Fund where they arrived aboard the Dutch Royal Family’s jet. They plan to travel to the Forest of Galilee to plant trees dedicated by Dutch Jews.

Among the last letters of this line are the telegram from the British Heart Journal that they needed a photograph to attach to the Einthoven article that would be published in that journal.

November 15, 1986 to Dennis. (Dennis is Dennis Krikler, chief editor of the British Heart Journal. This is a handwritten letter to Dear Dennis, and he’s discussing the Einthoven article.) “Frits had my full accord in sending the manuscript to you. Immodestly I too have believed it to be a fairly good rebuttal, (that is to the Cooper article) but seriously wonder what journal if any would judge it appropriate for publication. I would be flattered if the editorial decision to accept it was final. I would not (however) like your friendship for Frits and me to drown out your innate convictions.” And he adds the reference to Burnett’s statement.

November 16th letter to Frits, copies the note to the British Heart Journal and is self-explanatory with appreciation for his interest and activist’s role. “I was apprehensive that Dennis might be in a little dilemma if there were a conflict between his affection for us

and his editorial policies. Maybe I should not have worried. He is too good a scientist and editor to succumb to any nepotistic inclinations.”

He indicates that he’s heard from Dr. Cooper, who did not take “umbrage unduly by my critique.” He indicates that his health is stable, but he nevertheless is going to miss out on the American Heart Association regretfully.

And this little essay on flow volume measurement: “I expect the poisoning of the Rhine made big news in the Dutch papers. I suppose one could calculate the Rhine total flow if one had a good estimate of the amount of the indicator injected at Basel and the time concentration wave anywhere downstream.” (Clever! True?)

November 22nd. handwritten letter from Howard to Frits. “I was dumbfounded by your telephone call from your car. It came through so clearly and so free of background noise.” He indicates he’s figured out that the Rotterdam Water Works, (it took him a few minutes) that the Rotterdam Water Works were the illustration on the stamps of Frits’ last letter.

Asking again if he’s satisfied with the Einthoven manuscript. “I am proud enough of my little essay in defense of Einthoven as an ‘inventor’ of the string galvanometer for ECGs; but really did not think Dennis, British Heart Journal Editor, would think it particularly suitable for BHJ. I am increasingly pleased that he did so decide.” The rest of the letter is personal. He suggests reading Walter Laquer’s book on terrorism for some tough analytic reading.

And he mentions finally his health being satisfactory. “Things are not quite as young and productive as in years past, but no reasons to complain!”

A November 29th letter, and again a photocopy of the whale's ECG and indeed, it does show a very strange ST depression and biphasic T wave and irregular rhythm, for that matter.

He thanks Frits for the poster of a windmill.

December 5th with another photocopy, this time a picture of a very hail and hearty Frits walking along with, apparently, family members. He thanks him for his birthday greeting and telephone call and the windmill picture in the snowy setting and again refers to the unhappy event in Frits' life. "It will remain."

Then he mentions a letter from Dr. Duech, an interesting and informative letter. "It will remain confidential. It must have given you some solace, though little help in healing of the wound."

He advises Frits on shortening his essay on the AV node and sending it to *Circulation Research* since it was rejected by Journal of the American College of Cardiology. They speak of Anne Jennet's thesis, presumably a daughter of Frits'.

Letter of December 22nd. After the 'longest day' he calls it. I supposed he means the shortest day.

They talk about Frits' paper on AV conduction phenomena in atrial fibrillation with ventricular pacing and he was disappointed with the rejection of Frit's submission for a JACC editorial and is frustrated that he hasn't been able to make more constructive suggestions, but he will keep on trying to make the paper more readable and acceptable.

A Post script refers to the tulip bulbs planted six weeks before, and we are talking about winter-time here, that are beginning to show their tips. The Einthoven manuscript galley has arrived and seemed ok, and Howard regrets, of course, that he can't provide more thoughts and more references.

The final letter in this album is from December 28, 1986, handwritten from Howard to Frits. He has a little asterisked note at the top that it's the 20th anniversary of his giving the first Jesse Edwards Lecture in Tel Aviv at the invitation of Henry Neufeld. They exchange holiday greetings and talk of his shock to hear of Henry Neufeld's death.

He says, "I'm not very good at writing condolences, but hope my thoughts about Henry's contributions to cardiology and many kindnesses will give a modicum of comfort."

He promises to give more time to Frits' paper on AV conduction and he is looking forward to Frits' March visit to the Twin Cities. He indicates that he has apprehension these days about traveling and is turning down a lot of trips. He is arranging with Dr. Benditt for Frits to give a seminar in Minnesota.

Again, they talk about blooming of the tulips in the pots, about 5 cm above the surface. Then he has a rather curious point about checking electrical leaks in equipment. "I do not believe it should be taught, but one can pick up minimal leaks in equipment by touching a point on the chest lead? with a wire in the palm of the hand fastened to the water pipe. The rest of the body being well-insulated. One gets a little sting from many radios, TVs and kitchen appliances, indicating a leak in the causal diagram? of the wire from the palm of the hand to the plumbing pipe with body insulated, whatever that would mean.

And that is the inglorious ending to an album of rich correspondence.