

1761 Pine Tree Road
Winter Park, Florida
August 20, 1964

Mr. Philip G. Rust
Winnstead Plantation
Route 3
Thomasville, Georgia

Dear Mr. Rust:

At last, I have at hand a manuscript which just about gives complete answers --- in easy, non-technical form, but completely documented in a technical appendix or by references --- to all the questions that you asked me about rifle-fire, targets and gunnery, circa-1963.

As you remember, I declined to accept the task of relating and inter-interpreting various measures of accuracy and correspondence, even though you offered me \$150.00 a day for my work, on the grounds that (a) I did not feel entirely competent, and (b) that the work would require determining probability density distributions which would demand great time and effort, and that success could not be assured.

Instead, I discussed the matter with several competent statisticians to see if I could interest them in the problem. Perhaps you remember Gumble (in whose field of competence the most difficult problems lay) showed no interest. My very good friend, Dr. Frank E. Grubbs, whom I referred to as one of the top two or three mathematical and applied statisticians in the country, said that he was interested, and would work on it, but could not say when. I thought that he never would; and his motivation certainly was more science for science sake than a positive response to my inquiry (my opinion only). However, his almost sudden conclusion of the work may be partly in the nature of a "quid-pro-quo" to me for a job that he hooked me for to do for him, and on which I am working. I shall say more about this later.

Grubbs has the monograph (47 pages typed double spaced, which is not long, considering that this includes the appendix) in my hands for comments, suggestions, criticisms and correction of obvious errors. I have been over it once, and except for some minor omissions and similar matters it is really first rate. It is addressed to the rifleman, although the principles that it teaches are applicable to any

measurable phenomenon from birth of calves to production of transistors. It is simple to read (not above good high school level) and easy to apply by means of simple printed tables for samples from 2 to 15 for all ten of the fairly popular measures of variation.

He clearly defines (both graphically and in words) the following measures:

- Standard Deviation
- Extreme Horizontal Dispersion
- Extreme Vertical Dispersion
- Mean Horizontal Deviation
- Mean Vertical Deviation
- Radial Standard Deviation
- Mean Radius
- Extreme Spread
- Radius of Covering Circle

Diagonal of the including Rectangle

He discusses each measure briefly, and then gives a table from which one can readily express any given or observed measure for any sample-size; e.g., Extreme Spread for a sample of 10, in terms of its equivalent or expected value if one had used Mean Deviation, Radial Standard Deviation, etc. Also, one can make a valid comparison of the dispersion of a target of five shots (irrespective of the measure used) against another target of 10 (or any other number up to 15), irrespective of the measure used for the second target. One can also compare the efficiencies for the various measures; one can infer approximately the confidence level one might associate with the hypothesis that the target came from sources that are different levels of accuracy. Brief illustrative examples are given for the application of each table. Is this or is it not a rather complete answer to what you were looking for?

Grubbs asks me what to do with the paper. He recollects vaguely that I was asked the questions by a "Col. Rust or Col. Rusk". I shall recommend that he allow John Wiley & Sons publish it as a monograph in their scientific series. I am reasonably sure that Wiley will do so, and Grubbs may get some small royalties out of it. However, if you are anxious to see it, I would be willing to ask Grubbs, if he could return to me the copy that I am marking up, after it has served its usefulness, and permit me to send it to you. Publication may be a year from now. But, I have two other matters to cover, before I make a possible suggestion to you.

Grubbs did not do all the work himself. He was stuck on dead center on Extreme Spread. He turned to our mutual friend, Professor S. S. Wilks, of Princeton University, probably the top-most Mathematical Statistician in the Country, for nine years the Editor of the Annals of Mathematical Statistics. Look him up in Who's Who in America. Wilks did not succeed by classical attacks, and finally solved the problem in connection with some Air Force work by a Monte Carlo sampling procedure with the help of Mr. Paul Raynauld on an IBM 7090.

Computer using Fortan language. It was Wilks that suggested to me, when I was Chief of Research and Development of Army Ordnance, that I establish an Annual Symposium of Statistical Design of Experiment. He Chairmanned the Symposium for nine years.

Our good friend, Wilks, died last February. This is how I got the hard job that I am working on for Grubbs. Grubbs is Chairman of the Program Committee for the Tenth Annual Symposium at the Hotel Statler in Washington, this coming November. He insisted that I give a paper at the Tenth Symposium in commemoration of Wilks. I have been working on it off and on for several months; and now I have an idea that could greatly affect all of us. Mark that it is just an idea, so you do not have to feel sorry for me, if you do not go along with it.

I think that a rather masterful work has been turned out, as a result of your inquiring mind. You did not do the work: I did not do the work; but a number of people did it -- not really for you, but for Science. It may be a satisfaction to you, it may be a help to many small arms men, but far more important, it is an addition to human knowledge that benefits many people and aids in the solution of other problems of other types. It is of general application.

You can not pay me. I have just been a kind of broker in exchanges of knowledge. However, if you see fit, and if you can afford it, I would like the honor of announcing, at the conclusion of my commemorative paper on Wilks that you had founded THE WILKS AWARD -- say, a medal and a honorarium to be presented annually to the person judged by the Symposium Committee to have made an outstanding contribution to the aims and purposes of this continuing symposium. I would like also to explain how this particular instance of a significant contribution came about i.e., the progress of your inquiries from one scientific mind to another until, with no material reward in view, willing minds had cooperated, until the whole regime of the problem was solved, and the fruits left as an enduring value in our field of knowledge. I would like also for you to be a guest at the symposium and to say something about it -- it could be mere thanks to those who cooperated or could include your own thoughts on human relations, on stimulus to thought, or benefits to mankind.

xx
xx
xx

I think that the award could be established for the order of three or four thousand dollars, depending on the honorarium contemplated. It is the honor that would be important, rather than the specific sum of money. Even a hundred dollars would be significant.

This is copied
for you copy
as needed

I think also that it would particularly "top it off" if Grubbs (who did the great bulk of the work) were given the initial medal by you or your designee (not the first medal: this procedure is not unusual), together with a special honorarium of say \$500.00. That would pay him perhaps a dollar an hour for his work. If this should go thru, would you permit me to recommend that you present the initial medal?

Of course, I do not have the authority to do any of these things. I need first, the authority from you to commit you to what extent, if any, you see fit. I need consultation with you and with the Committee about the rules that might govern the award. The question is, do you wish me to get to work on this job? I will do this one. In any event, give me your thoughts.

With kindest regards,

Leslie E. Simon
Maj Gen USA(Ret'd)

P.S. By the way, it takes a bit of time to get a medal designed and struck, and some haste will be required to meet the date of November 4 to 6, when the Symposium convenes.

L.E.S.

* He is willing to furnish the \$500.00 honorarium to go with the initial medal to Grubbs provided that I secure whatever approval is necessary for giving Grubbs the initial medal. Incidentally, I would like to conceal from Grubbs the matter of the special honorarium, and leave it as a surprise at the time of the presentation of the medal, again provided concurrence is obtained from the proper organization.

1761 Pine Tree Road
Winter Park, Florida
September 6, 1964

Dr. F. G. Dressel
U.S. Army Research Office - Durham
Box CM
Duke Station
Durham, North Carolina 27706

Dear Dr. Dressel:

I need some action on a matter very, very fast. I talked to Frank Grubbs about the matter on the telephone last night, and he suggested that I look to you to get it done.

In order to understand the matter, please stop at this point and read the enclosed carbon copy of a letter that I wrote to Mr. Philip G. Rust.

I assume that you have read the copy of my letter to Rust. I talked with Rust last night on the telephone; and, believe it or not, he accepts all of my suggestions with delight, except he wishes to remain anonymous. He is willing to pay for the medal and is aware both of the first cost of striking the medal and of the smaller subsequent cost per medal. He is willing to furnish a \$100.00 honorarium to go with future medals either by paying it at the time of presentation or by establishing a fund or endowment for it, estimate at \$3600.00.* This is the substance of my oral conversation with Mr. Rust, who, incidentally, knows and liked Wilks.

Now, let me indicate briefly the things that I think need to be done; certainly there will be others in addition:

(1) ARO will have to grind through the necessary red tape to set up the acceptance by the Army of an award sponsored by an individual. In this connection, I would suggest that if it becomes burdensome, enlist the assistance of Joe Lane. He is not only competent but also a good friend.

(2) Have the necessary authority established for some group e.g., the program committee, to establish the rules for the award. They might be as simple as:

"to be presented annually to a meritorious person who has made significant contributions to statistical methods used by the Army, and whom the program committee judges to be deserving of the award".

(3) Designate to me the extent to which I can use the instance of the award as an illustration of scientific cooperation due to the stimulus and example of Wilks, when stimulated himself by scientific inquiry.

(4) Get the above package to me swiftly so that I can get in touch with Mr. Rust and get him to transmit the necessary funds to the proper person or office. This needs to be specific, even down to who the check should be made out. We would not wish to cast any undue burdens on Mr. Rust.

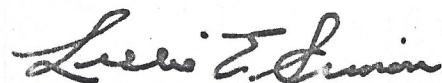
(5) Start as early as practicable after authorization and funding with the job of getting the medal designed and the first one, two, or more medals struck. Perhaps a facsimile of Wilks, a place for engraving the recipient's name and some dates on one side and on the obverse side a notation to the effect that the award is in honor of Wilks and is awarded annually on such and such a basis -- make the wording brief. (I used to be on the Shewhart Medal committee) Failing in point of time, one can resort to the old hoax of presenting an empty box.

The above is all I can think of at the present time but I am sure there will be more to be done. Even if you do it yourself, you will need to appoint a worthy subordinate as a pusher, or am I mistaken? Oh, yes! I am sure you will not fail to secure promptly the approval of your very fine commanding officer, Nils Bengtson; I am sure he would be glad to lend every assistance.

Personally, I am not at all in favor of Rust's remaining anonymous. He was a research chemist before he went into the plantation and brokerage business; he is not without a modest degree of competence in applied statistics; and he has an inquiring mind and the perseverance of a basic research worker. He specifically wishes to attend the symposium; and I think that his name should be used at least by me in my paper and that consideration should be given to requiring him or his wife as designee to present the initial medal to Grubbs. I think he will do it if the committee puts the screws on him by way of a personal letter from Bengtson.

Please telephone me Area Code 305--647-7155 about any significant matter. The acceptance or turn-down on this will affect my paper which I know you will want more promptly than I can turn it out.

With sincere regards,



Leslie E. Simon
Maj Gen USA(Ret'd)

Copy to:

Frank E. Grubbs

14 September 1964

Dr. Francis G. Dressel
Army Research Office-Durham
Box CM, Duke Station
Durham, North Carolina

Dear Francis:

Thank you for sending copies of General Simon's two letters. Frankly, after reading them, I have mixed and confused feelings about the intent of the award. Consequently, I will disregard the letter that he wrote to Mr. Rust and comment on his letter to you.

Any individual or organization (just about) can give awards to in-house personnel. Thus, Mr. Rust has the prerogative of establishing an award and developing the appropriate rules for determining the recipient of such an award. As a result of talking to the Personnel people, we've been informed that we can play no role in handling the funds or creating the medal. However, we can assist, if Mr. Rust so desires, in establishing a committee to choose an appropriate recipient provided that Mr. Rust establishes the award procedure or delegates that task to the committee.

I want to add that I am somewhat unhappy that there is consideration being given to awarding a different sum for different people. It seems to me that a fixed prize should be established to be given with the proposed medal. Again, this is Mr. Rust's option. I might note that since a medal is proposed, I think that permission should be obtained from Mrs. Wilks to use Professor Wilks' name.

IVAN R. HERSHNER, JR.
Chief, Physical Sciences
Division

Assoc. of U. S. Army

Ass. of the Army

forwarded to Gen. Johnson by Dr. Dressel on 25 Sept.
for him to make choice.

1761 Pine Tree Road
Winter Park, Florida
September 24, 1964

Lt. Col. Kenneth R. Bull
Executive Sec'y,
Army Scientific Advisory Panel
Dept. of the Army
Office of the Chief of R&D
Washington, D. C. 20310

Dear Colonel Bull:

I enclose a copy of a letter that I wrote to Mr. Philip G. Rust. Please read it so that you will understand a proposal that I am trying to put over, and so that you will be able to do something about it.

Astonishingly enough, Mr. Rust accepted my proposal, lock, stock, and barrel. Immediately upon receipt of Rust's telegraphic acceptance, I wrote a letter to Dr. F. G. Dressel, who is in charge of the program for the Tenth Symposium urging him to take immediate steps to get the "Wilks' Award" set up on a business basis. A business basis for the award is indispensable to having the endowment that Rust is willing to give (estimated at three to five thousand dollars) accepted by an established body and properly administered -- this in addition to getting the medal designed and struck, if practicable by the November 4 - 6, 1964 symposium.

After almost three weeks, Dressel does not seem even to have found an avenue of approach. I am greatly embarrassed because of not being able to inform Mr. Rust of the dollar value of the funding required, the organization to whom the check should be made, and what will be done relative to the presentation of the initial medal at the November symposium. I can handle the last matter myself, but the other two require swift action in the Pentagon. I am sure that Mr. Hawkins would lend all the power of his office to getting this thing through. It is tragic to allow a thing that can be of such benefit to the Army to die by default. It would be a continuing and beneficial stimulus to our whole scientific effort and a reward to the best of our enterprising people. Please lend your competence and effectiveness to getting this thing through swiftly.

I asked Dressel yesterday by telephone to get this matter into your hands but I doubt seriously that he will

explain it to you adequately. If I were in Washington, I would go to Mr. Hawkins myself but I do not wish to burden him with reading the three and one-half page letter that I have imposed on you. You can give him a three minute oral synopsis of it. Please return the letter to me because it is my file copy.

Note that it is not necessary that the handling of the money be done by Government. It can be done by a university, any non-profit and patriotic organization, or perhaps by the National Academy of Arts and Sciences. Whereas some Army action giving the award an official status is desirable, I am not at all sure that even Army approval of the award is necessary. Could you check this? Better check with Legal or perhaps with the Executive Secretary of the National Academy if you choose. Telephone me as early as you can to get me off the hook with Rust. I will deeply appreciate your efficient help in this matter.

I would like to keep secret from Dr. Grubbs the matter of the honorarium to accompany the award of the initial medal. He is aware of all other matters and so is Dressel.

Sincerely yours,


Leslie E. Simon
Maj Gen USA(Ret'd)

1 incl:

My file copy to Philip G. Rust

1761 Pine Tree Road
Winter Park, Florida
October 3, 1964

Lt. Col. Kenneth R. Bull
Executive Secretary
Army Scientific Advisory Panel
Department of the Army
Office of the Chief of R&D
Washington D. C. 20310

Dear Colonel Bull:

After our conversation of Wednesday, I wasted two days trying to get in touch with Dr. W. Allen Wallis, President of Syracuse University and President-Elect of the American Statistical Association. After that, I called Donald Riley, Executive Secretary of ASA, who was absolutely tops in his cooperation. To bring you up-to-date, please let me impose upon you to read all three of the enclosed documents; and read them in this order, (1) copy of letter to Dr. Dressel (2) copy of letter to Mr. Donald C. Riley (3) copy of "Obligations of ASA".

We have really got this ball to rolling, thanks to your office and JAG, and despite the proximity of the deadline, we can expect to make the grade. Please check out with Major Zalonis on the legality of the Obligations of ASA. Please give me a reaction about the invitation to Mr. and Mrs. Rust (we may have to get behind this to keep it from hanging fire). Please discuss with JAG and see to getting a letter addressed to me, for me to pass on to ASA expressing an Army position on the Award so that it will be clear that ASA is doing something for the Army. This will also obviate any future objection to the recipient of an Award being an Army man. It will be official. It may be best to address the letter to ASA directly from the Secretary after the agreement is firmed up.

I thank you very much for the way you have cleared this matter up and hope that you will advise me of any mistakes or pitfalls that seem eminent.

With best personal regards,

Leslie E. Simon
Leslie E. Simon
Maj. Gen. USA (Ret)

P.S. See personal enclosed.

U. S. ARMY RESEARCH OFFICE - DURHAM
BOX CM, DUKE STATION
DURHAM, NORTH CAROLINA 27706

IN REPLY REFER TO:
CRD-AA-M

7 October 1964

Mr. Fred Frishman, Chief
Mathematics Branch
Physical Sciences Division
Army Research Office
3045 Columbia Pike
Arlington 4, Virginia

Dear Fred:

We are inclosing a copy of the letter by General Simon to this office. We are also inclosing a copy of his letter to Mr. Donald C. Riley. We thought you might be interested in rules that are being laid down to handle the Sam Wilks Memorial Fund. The undersigned appreciates the fact that you are willing to send a special invitational letter to Mr. and Mrs. Rust.

Please save the addresses of the persons that attend the conference. These will help in the work of this office at the time the Proceedings are issued.

Sincerely yours,

Franis
F. G. DRESSEL
Assistant
Mathematics Division

Incl
as

CRD-AA-M

7 October 1964

Mr. Fred Frishman, Chief
Mathematics Branch
Physical Sciences Division
Army Research Office
3045 Columbia Pike
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Please save the addresses of the persons that attend the conference. These will help in the work of this office at the time the Proceedings are issued.

Sincerely yours,

Incl
as

F. G. DRESSEL
Assistant
Mathematics Division

1761 Pine Tree Road
Winter Park, Florida
October 2, 1964

Dr. F. G. Dressel
U.S. Army Research Office - Durham
Box CM, Duke Station
Durham, North Carolina 27706

Dear Dr. Dressel:

Several days after our last telephone conversation, I had a telephone conversation with the Office of the Assistant Secretary for R&D. Col. Bull had Maj. John Zalonis of JAG on the telephone line with him. Col. Bull said that they had decided that it was best to explore the American Statistical Association as custodian for the endowment of the Wilks' Award. I told him that I had thought of the same thing myself and that it looked good to me. It was concluded that I should undertake the job of getting ASA's reaction; and if favorable, that I should explain matters to ASA in detail, and find out precisely what the whole agreement would be.

Accordingly, I called Mr. Donald C. Riley, Executive Director of ASA, who expressed great enthusiasm for the project and asked me to set forth for him in writing complete information about the proposed Award so that he would have a basis for an emergency solicitation of the Members of the Council to get prompt action for us. He wished specifically to know what the obligations of ASA would be and a tentative set of the rules to govern the Award.

I enclose a copy of my letter of yesterday to Mr. Riley together with an enunciation of the Obligations of ASA (as I saw them) and an enunciation of the Bases of the Wilks' Award. Will you please give me your criticisms and any suggestions or advice (if practicable, do so by 10 o'clock, Tuesday, October 6; otherwise, Thursday, after 10 p.m. or Friday morning).

After talking with Riley, I called Mr. Rust, apologized for our unavoidable delay, and told him the story up to that point. I have followed up this conversation with a letter to Rust in which I estimate the total cost as:

Design of Medal (est)	\$1000.00
Endowment Fund	3500.00
Honorarium to Dr. Grubbs	500.00
(on presentation of initial Award)	
Total	\$5000.00

Rust is very enthusiastic and wishes to pay me a visit before our November 3 meeting. In view of the situation, I believe it impracticable to follow the last paragraph of your letter of September 25 in which you say that it has been suggested that we merely announce the memorial fund at the Tenth Conference and that plans call for the first recipient of the Award to be announced next year. Such a delay would not only dissipate present enthusiasm (which reflects much credit on the Army) but be such an anti-climax that Rust might drop the matter altogether because he would feel unappreciated. Furthermore, it is easy to see that Rust, although a very modest man, definitely wants to come to the Conference. Therefore, I urge that a very cordial invitation be issued at once to Mr. and Mrs. Philip G. Rust to come to the Conference as honored guests of the Army and see to it that they incur no registration fees or other expenses incidental to the Conference itself. Of course, they would pay their own traveling expenses. I think this invitation should emanate either from Colonel Bengtson or from Mr. Hawkins. If you or Bengtson so wish, I can see to it that Mr. Hawkins does it. Please let me know if you concur in these views.

As a corollary to the above, I think that it would be most gracious for you or Bengtson to ask that either Mr. or Mrs. Rust present the honorarium (not the Medal) to Grubbs. He may refuse; would say very little if he accepts the duty; but I think that he should be asked. Please tell me what you and Colonel Bengtson think about this so that I may be guided in my conversations with Rust.

I will appreciate very much any other guidance you give me in connection with the whole matter.

Sincerely yours,

Leslie E. Simon

Leslie E. Simon
Maj Gen USA(Ret'd)

2 Indis

Copy to:
Lt. Colonel Kenneth R. Bull

1761 Pine Tree Road
Winter Park, Florida
October 1, 1964

Mr. Donald C. Riley
Secretary - Treasurer and Executive Director,
American Statistical Association
810 18th Street, N. W.
Washington, D. C. 20006

Dear Mr. Riley:

Pursuant to our telephone conversation of this date, I enclose (1) a draft of what I picture as the obligations of ASA which I have checked by telephone with the Office of the Assistant Secretary of the Army for R&D and with the Office of the Judge Advocate General. This does not mean that my draft is right: it means merely, that heard orally by them, it appeared unobjectionable. I solicit your criticisms, advice and guidance.

I enclose also another brief paper, "Bases of the Wilks Award". It will give you some of the information that you need in presenting this matter to the Members of the Council. It is written in quite impersonal form because I am merely a kind of honest broker in this whole matter and not a contributor of anything fundamental.

Briefly, Mr. Philip G. Rust of Thomasville, Georgia telephoned me about a statistical problem. I believe that he is an ex-Ordnance Officer and had heard of me. He is a small arms enthusiast, and he was disturbed because he was unable to compare measures made of small arms targets. For example, one man reports that he shot a target of five shots with a mean dispersion of 1.4 inches. Another man reports that he shot a target of ten shots with an extreme spread of 3.2 inches. What can Rust judge about the relative precision of fire of the two men? Actually, there are ten different statistics used for measuring small arms fire.

Later, Rust paid me a visit, and even tried to employ me to solve his problems. I declined but did try to help him by references to standard works and by discussion of his problem with statistical friends, among them Dr. Frank E. Grubbs.

About a month ago, I received from Grubbs the draft of a monograph for comment, criticism and advice about publication. Grubbs covers thoroughly just about all of Rust's questions. Incidentally, a part of Grubbs solution was obtained through the cooperation of Wilks who, in turn, had