YR enquiries

65 Granada Court
Portola Valley, Calif.
94025

June 20, 1984

Professor Matthew Meselson
Department of Biochemestry and Molecular Biology
Harvard University

Dear Professor Meselson:

Reference your June 15, 1984 letter, I didn't make an inquiry. I made a statement.

But from the background and experience of a lifetime career in, and directly concerned with, these and surrounding areas there are a multiplicity of pertinent inquiries that I might address to you and your collaborators. Among many others would be:

How many years did you live in these areas?

How extensive and thorough were your travels throughout them? (Obviously impossible, given the belligerency and non-security of recent decades.)

What was the competence, reliability and the credentials of your interpreters and translators working with these esoteric languages and primative dilects?

How many years did you work through your chief interpreter so as to become fully familiar with his vocabulary limitations, his methods and interpretive approach and the accuracy and appropriatness of translation?

How do you deal with the native inborn propensity of Orientals to answer "yes" and to tell interlocutors, especially foreignors, what he thinks they want to hear?

Yours truly,

Mac Lean Ulrich

CORR-
PRW

DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY
HARVARD UNIVERSITY

7 Divinity Avenue
Cambridge, Massachusetts 02138

June 18, 1984

Michael William Tingstron Corr
Asian Medical Phyto-geography
Smith hall DP-10
University of Washington
Seattle WA 98195

Dear Mr. Corr:

Thank you for sending me a copy of your letter to Professor John Constable of April 4. Unfortunately, the American Academy of Arts and Sciences Herbicide Assessment Commission is no longer in operation and I know of no funds which might be used in support of this interesting work.

Sincerely,

Matthew Meselson
Professor of Biochemistry

MM/db

ASIAN MEDICAL PHYTO-GEOGRAPHY, SMITH HALL DW-10

Professor John B. Constable, M.D.
Department of Surgery, The Medical School
Harvard University, 7 Divinity Avenue
Cambridge, Massachusetts 02138

April 4th, 1984

Dear Professor Constable,

In his letter of March 21, 1984, Professor Mathew Meselson, Harvard Dept. of Biochem. and Molecular Bio., and Chairman of the AAAS Herbicide Assessment Commission, mentioned to me that you have recently participated in a conference on the health effects of herbicides in Vietnam. In your article, 'The Ecological Impact of Large Scale Defoliation in Vietnam' (Sierra Club Bulletin 56 pp. 4-9, April 1971) you note that destruction from the insecticides was especially insidious because of the high rate of utilization of botanical natural resources by Vietnamese occupations. I personally would very much like to see a draft of your current report, or hope you will let me know how it will be published.

Between 1969 and 1973, I was Executive Secretary of the AAAS Committee on Environmental Alterations, and a Center Associate of the Center for the Biology of Natural Systems, Prof. Barry Commoner, Director, at the Botany Research Laboratories of Washington U. in St. Louis. We co-authored a number of articles and Testimonies before I accepted a position as Research Fellow at the Research Institute for Humanistic Sciences at Kyoto University in Japan. My research there resulted in several papers including 'Environmental Husbandry and the Historical Japanese Village' (Kyoto Review, No. 7, Spring 1976), and 'Lake Biwa Watershed: Problems of Agricultural and Industrial Pollution' (M.A. thesis, Geography, U. of Washington, 1981), while my field notes and further research here at the U. of W. have resulted in a substantial draft for my Asian Medical Phyto-geography dissertation, 'An Ethnophenology for Kyoto with Applications of Geographical Relativism to East Asian Medicine'. From the paleolithic through 750 A.D., I have examined trends in Japanese plant communities associated with the human environment, especially with an eye towards materia medica. I will present an incidental paper entitled 'The 750 A.D. Manyoshu and Medical Geography' on the 17th of April 1984 at the 7th Ethnobiology Conference here at the U. of Washington. I deal with around 1000 species of human interest in this research project, and note that the Conference features dozens of botany papers which might serve as paradigms for plant utility in your research. The registration fee for the 15-7th April conference is $40, to be sent to Conferences and Institutes in Continuing Education, U.W., DW-50, Seattle WA 98195. Alternate status for your important Vietnamese NAC report at the conference might possibly be arranged through my dissertation adviser, Prof. E. Ihum, Dept. Anthro., AL-10 Denny Hall, U. of W. (Tel. 206-545-6825).

B.S., Math., (Antioch '63); M.A. Math (U.W. '65), M.A. Geog. (U.W. '81), Ph.C., Asian Medical Phyto-geography (U.W. '82; possible completion in 1984), I seek a research or teaching position in asian, environmental, anthropological or geographical studies. Any suggestions would be appreciated.

Cc: Prof. Gordon Orians, Inst. for Envt. Studies, U. of W.;
Dr. Okamura Hitoshi, K.R.C.I., Kyoto U. Medical School
Prof. N. Niven, U. of Pennsylvania

Sincerely,

Michael William Singstrom Corr, B.C.
(Home: 621 27th E., Seattle 98112)

Asian Medical Phyto-geography
Smith Hall DP-10, U. of W., Seattle 98195
Washington

Dear Professor Matthew Meselson,

As you have suggested, I have asked your colleague, Prof. John Constable, Dept. Surgery, Harvard, for details on his new manuscript regarding the AAAS Herbicide Assessment Commission's interest in the health effects of chemical warfare in Vietnam. My work (funded at 1500 dollars for 12 years of field work and consultations in or with Japan) has resulted in a 500 page dissertation on utilization of economic and subsidiary species numbering about 1000. I would be willing to provide the AAAS HAC with an advanced copy of this for one year wf my former salary with the AAAS Committee on Environmental Alterations, $12000

As you know minor species are important as vegetables, increasisng the complexity of your analysis. Siri von Reis Altschul (Harvard Pr., 1976), and 'Tanaka's Cyclopedia of Edible Plants' (1976) often mention SE Asia. Do you have a comprehensive list or reference for economic and medicinal species for SE Asia? I could use one, especially if the early history of use is indicated, as has been in the Zhong Yao Da Tsu Dien (1979, Honk Kong, Peking) herbal.

Sincerely,
Michael W. Corr

Cc. Prof John Constable
Prof. E. Hunn, AJ 10 Anthro UW
Prof N. Sivin, U Penn
Prof G Orians, Zoology, UW

Inch - cw file

DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY
HARVARD UNIVERSITY

7 Divinity Avenue
Cambridge, Massachusetts 02138

August 6, 1984

Dr. Thomas Inch
Chemical Defense Establishment
Porton Down
Salisbury, Wiltshire
SP4 OJQ GREAT BRITAIN

Dear Tom:

Under separate cover, I have sent 13 samples for trichothecene analysis. They are described in the enclosed list.

The Coomassie blue we have used for pollen staining is Coomassie Brilliant Blue R-250, from BioRad. In the U.K., they are at Caxton Way, Watford, Hertfordshire; telephone 0923-40322. We use a solution containing

0.05%	dye
25%	methanol
10%	acetic acid

Dissolve 0.1g dye in 130 ml H_2O, add 50 ml methanol and 20ml glacial acetic acid. Filter before use. Stain for 5-30 minutes, depending on intensity desired. Centrifuge and wash once with water before examination.

With this letter I enclose an admirable old monograph on the digestion of pollen by honeybees and a bibliography on A. dorsata prepared by Professor Roger Morse of Cornell.

I thought it very useful to discuss some of the scientific questions involved in this puzzle with you and Jim Creasey. I will be in England again, for five days, November 26-30 and would value an opportunity to continue the discussion, either at Porton or in London. I look forward to hearing from you.

Sincerely,

Matt

Matthew Meselson
Professor of Biochemistry

Samples from Thailand sent to CDE Porton - 4 August 1984

Sample	Description
#3	Mung beans
#7	A. dorsata-1 comb
#10	A. florea-1 comb
#12	A. dorsata-2 comb
#14	A. dorsata-4 feces
#17	Sorghum
#18	Sorghum
#23	Wild Honey (purchased)
#29	A. dorsata-10 feces
#31	Ban Vinai paddy
#32	Ban Vinai corn
#35	Wild Honey (purchased)
#36	Wild Honey (purchased)

Dean, J. -
Dean

Carnegie Endowment for International Peace

August 6, 1984

Professor Matthew Meselson
Department of Biochemistry
Harvard University
7 Divinity Avenue
Cambridge, Massachusetts 02138

Dear Professor Meselson:

I am making a move and wanted to let you know my new address and phone number. At the beginning of August, I will be leaving the Carnegie Endowment to take on a new position as arms control adviser to the Union of Concerned Scientists. My new address will be:

Jonathan Dean
Union of Concerned Scientists
1346 Connecticut Avenue, N.W.
Dupont Circle Building, Suite 1101
Washington, D.C. 20036
(202) 296-5600

With best regards,

Jonathan Dean

Jonathan Dean
Resident Associate

Proxmire

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M. DANNY WALL, STAFF DIRECTOR
KENNETH A. McLEAN, MINORITY STAFF DIRECTOR

United States Senate

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS
WASHINGTON, D.C. 20510

July 6, 1984

Dr. Matthew Meselson
Department of Biochemistry and
Molecular Biology
Harvard University
Cambridge, MA 02138

Dear Dr. Meselson:

Numerous questions have been raised over the capability of the United States to verify arms control agreements with the Soviet Union. The Reagan Administration has held up negotiations in several areas of arms control because of a concern that our verification capabilities would not be adequate to monitor Soviet compliance.

I would deeply appreciate having your assessement of the current verification capabilities of the United States through national technical or other means. In particular, I would be interested in your view on how adequate our current verification capabilities are or would be to monitor Soviet compliance with: the SALT and ABM treaties, the Threshold Test Ban and Peaceful Nuclear Explosions treaties, a comprehensive test ban treaty, an INF treaty, the Administration's START treaty, a freeze treaty, a treaty banning the testing and deployment of anti-satellite weapons or other space-based weapons, a treaty banning the testing and deployment of sea-launched cruise missile. If present verification capabilities are not adequate, what other verification measures (such as on-site inspections) might be needed to monitor any of the above treaties?

I would also be interested in knowing what you think of future U.S. verification capability. Will it improve or weaken? Will the deployment of certain weapons systems make verification easier or more difficult?

Again, I appreciate having your thoughts or any research you might have conducted on these issues. During the past two years, I have been intensely reviewing the arms control literature and I have been delivering an arms control speech on the Senate floor every day the Senate has been in session. Your comments, therefore, will be most helpful.

With best wishes.

Sincerely,

William Proxmire, U.S.S.

WP:dwc

Proxmire - mm 98.

August 7, 1984

Senator William Proxmire
United States Senate
Committee on Banking, Housing
and Urban Affairs
Washington, DC 20510

Dear Senator Proxmire:

Thank you very much for your letter of July 6 asking my views of the capability of the United States to verify arms control agreements with the Soviet Union. The particular questions posed in your letter all deal with with nuclear space and missile issues. I do not have thorough knowledge of these matters and therefore I am not able to respond to your questions regarding them.

It may be, however, that you are also intrested in the are of chemical and biological weapons arms control. These are subjects which I have studied closely for more than 20 years, as a consultant to various agencies of the U.S. government and also as a university scientist. My strong opinion is that the United States' verification capability in chemical and biological matters must and can be considerably improved if we are to avoid seriously erroneous evaluations, such as some which have occurred in the recent past. If you or your staff wish to discuss this subject with me in detail, I would be glad to be of assistance.

Sincerely,

Matthew Meselson
Professor of Biochemistry
and Molecular Biology

To Bunner

August 8, 1984

D. L. Bunner
Army Medical Research Institute
of Infectious Diseases
Fort Detrick, MD

Dear Dr. Bunner:

I wonder if you would be so kind as to send me a copy of your 1983 report entitled 'Acute Trichothecene Intoxication in Animals'. If possible, I would like a copy of this and any other available reports from the AMRIID dealing with trichothecenes.

I look forward to receiving the report and if there are related materials I could supply you with, please let me know.

Sincerely,

Matthew Meselson

Sheehan

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CHEMISTRY
CAMBRIDGE, MASSACHUSETTS 02139

JOHN C. SHEEHAN
PROFESSOR OF CHEMISTRY, EMERITUS

August 14, 1984

Professor Matthew S. Meselson
Department of Biochemistry and Molecular Biology
Harvard University
7 Divinity Avenue
Cambridge, MA 02138

Dear Matt:

It was good seeing you Sunday, August 12, 1984, at Woods Hole and Falmouth. Enclosed are copies of some of the correspondence with Frank Press concerning "yellow rain." As discussed, I am planning to send a draft copy of a letter to the "Wall Street Journal" for your comments. Hopefully this will be forthcoming within the next few days. I suspect that the other members of the Committee were not aware of the high toxicity of the nerve agents.

Sincerely,

John

John C. Sheehan
Professor of Chemistry
Emeritus

JCS:ep
enclosures

July 17, 1984

Dr. Frank Press, President
National Academy of Sciences
2102 Constitution Avenue
Washington, D.C. 20418

Dear Frank:

It was good to see you on July 5 at the dinner for Elkan Blout. As we discussed briefly I would be pleased to have my correspondence with you and the NRC staff made available to interested parties. My letters to you dated September 26, 1983 and to Dr. William M. Stigliani on September 9, 1983 are of particular interest. For example, I had a telephone conversation regarding "Yellow Rain" with Mr. Phillip Boffrey(sp?) of the New York Times, but did not feel free to inform him of the aforementioned letters.

My point was that Mycotoxin T-2 (purportedly the most toxic of the group) probably would not qualify as an effective antipersonnel agent, especially in a jungle setting. If one accepts this conclusion the question of whether Mycotoxins have been used is moot.

Hope to see you soon in Woods Hole.

Sincerely,

John C. Sheehan
Professor of Chemistry
Emeritus

JCS:ep

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CHEMISTRY
CAMBRIDGE, MASSACHUSETTS 02139

JOHN C. SHEEHAN
PROFESSOR OF CHEMISTRY, EMERITUS

September 26, 1983

Dr. Frank Press, President
National Academy of Sciences
2102 Constitution Avenue
Washington, D.C. 20418

Dear Frank:

I have signed the "Report of the Committte on Protection against Tricothecene Mycotoxins." However, I am taking this opportunity to convey to you personally some reservations which I have concerning this report.

My first concern is that the proposed program, especially the recommendations contained in Chapter VIII, are out of proportion to the challenge, either civilian or military, posed by the evidence. The research effort recommended still seems at an unrealistically high level, although the suggested actions have been moderated considerably in the revised version. The recommendations are open ended with no indication of size of effort in terms of time, budget, manpower and facilities, all of which are limited.

In order to obtain some perspective consider, in no particular order, the medical priority which should be accorded the tricothecenes as compared to cancer, heart, athereosclerosis, diabetes, arthritis, malaria, kidney and liver disorders, new infectious diseases, multiple sclerosis, muscular distrophy, and so forth.

It is useful to compare the military effectiveness of tricothecene, especially Mycotoxin T-2, with standard chemical warfare agents.

First, omitting live micro-organisms, there are the microbiologically derived agents, such as botulinus toxin. It has been estimated that eight ounces of this substance, properly dispersed, would anihilate the world population. In addition, there is staphyloccocal endotoxin, which is considered an incapacitating agent with some lethality.

Second, there are nerve gasses, such as GB, chemically $CH_3(OC_3H_7)_2FPO$ (Sarin). Related compounds are VX and the binary nerve agents. All are approximately equal as lethal chemicals. The lethal dose of Sarin has been estimated as on milligram per 50 kilogram person.

70

Third, there are harrassing agents, usually vesicants, such as HD, distilled mustard gasses.

Fourth, there are the super tear gasses, such as CS (o-chlorobenzalmalononitrile).

Chapter VI-29, lines 15-17 of the report reads as follows: "De Nicola et al. (1978) reported necrosis of the myeloid tissue of the bone marrow of guinea pigs given T-2 toxin in doses of 2.5 or 5.0 mg/kg bw." Tables 6-2 and 6-3 list the LD_{50} (mg/kg) of T-2 as approximately 5 mg/kg with various animals. Since GB has a toxicity of approximately 0.02 mg/kg assuming no

species difference toxin T-2 would be between 100 fold and 1,000 fold less lethal than the nerve agents. If one were interested in lethality GB would be the ovious choice and HD would be the selection as a harrassing agent.

The tricothecene mycotoxins might be attractive for clandestine use in a jungle setting where it might be difficult technically to detect these compounds in the presence of the natural background of toxins. However, given the difficulty of dispersing the agents, it would seem that the use of tricothecene mycotoxins would be only of marginal effectiveness.

The Academy should recommend a greater role for non-military advice, not just feeding in new scientific information, but also expressing opinions on new technology transfer.

I hope the foregoing expresses some of my misgivings. I enjoyed serving on the Committee even though my evaluation of the situation differs from that of many Committee members.

Sincerely,

John

John C. Sheehan

JCS:lab

P.S. Also please consider my letter of September 9, 1983 to Dr. William Stigliani.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CHEMISTRY
CAMBRIDGE, MASSACHUSETTS 02139

JOHN C. SHEEHAN
PROFESSOR OF CHEMISTRY

September 9, 1983

Dr. William M. Stigliani
National Academy of Sciences
JH 651
2101 Constitution Ave., N.W.
Washington, D.C. 20418

Dear Bill:

As I discussed with you by telephone, I still have the same concerns expressed in my letter to you of August 12, 1983 concerning the Report of the Committee on Protection Against Tricothecene Mycotoxins. I am especially concerned over the content of the recommendations in Chapter 8 many of which I consider unrealistically broad, and if an attempt is made to implement them in anything like the present form would be unreasonably costly and time consuming and not cost effective.

I have no objections to recommendations 1, 2, and 3 if the size of the programs are kept at realistic levels.

Recommendation 4 is already being investigated in civilian situations.

Recommendation 5 is not only unnecessarily broad, but would require not only an extensive program but also a substantial period of time, presumably years to accomplish. Any study of persistence and study of the products of nonbiological and microbial degradation would clearly require an extensive and long-range project. The necessity for this recommendation is highly questionable. Perhaps the most objectionable in terms of breadth and potential commitment of resources is recommendation 6 which is almost a caricature. This would be a good candidate for the "Golden Fleece Award." This recommendation could be construed at best as an open-ended invitation for almost any type of proposal in this broad area. I had to read this section a number of times before I could believe my eyes. It is my opinion that the National Research Council and the National Academy would be subject to severe criticism by responsible members of the scientific community, if this recommendation is adopted in its present form.

Recommendation 7 would simply be a slight improvement of methodology dating back to World War II, taking advantage of newer fabrics and coatings.

Recommendation 8 does not make much sense to me. It is not clear technically how the recommendations could be implemented.

Recommendation 9 is potentially the most dangerous recommendation of all, since it would propose to "extend to protection against other potent biologically produced toxins." This would include the botulinus toxin, the staphyloccocal endotoxin, among others. Historically, a study of methods of protection against chemical and biological agents has been used as an entry into research on offensive

military applications of these materials. In the late 1960s the U.S. signed an agreement against the use of biological materials for military purposes, and this recommendation might be used to weaken or circumvent this agreement.

Number 10 is the recommendation this Committee member agrees with most wholeheartedly. In some ways it is a recommendation in favor of applie pie, but it should be included since even this obviously essential procedure is being challenged.

In summary, I feel that I could not sign this report with the recommendations in their present form. I feel the matter needs to be explored further at an appropriate level and perhaps called to the attention of Dr. Bryce Crawford when the document is reviewed by the Academy itself. I would suggest as further outside reviewers among others Professor Paul Berg, Stanford University, Professor James Watson, Cold Spring Harbor, L.I., N.Y., Professor Paul Doty of the Kennedy School of Government, and Professor Bernard Davis of Harvard University, all Academy members. I am sorry that I feel it necessary to take this stand at such a late stage. You will recall that I was out of the country at the time of the June Committee meeting and by some unfortunate oversight was not sent this last copy and other material until September 7.

Sincerely,

John

John C. Sheehan

JCS:lab

Chapter 8

RECOMMENDATIONS

Of the many potentially fruitful areas of research described in this report the committee wishes to draw attention to 10 promising areas, which are listed below. The committee recognizes that there are important areas of research other than research on mycotoxins which deserve attention. Thus, the following research recommendations should be examined in light of the benefits and costs of each. An elaboration of these recommendations, and the rationale behind them, appear in the preceding chapters.

1. A systematic program should be undertaken to determine the global distribution of naturally occurring trichothecenes.

2. Efforts should be directed toward the development of protocols for sampling in the field. Further research is needed on the application of thin-layer chromatography (TLC) and the enzyme-linked immunosorbent assay (ELISA) for the identification and quantitation of various trichothecenes present in a variety of sample materials. Other methods that are less promising but nonetheless warrant attention include remote sensing techniques and assays based on the susceptibility of living organisms to trichothecenes. Gas-liquid chromatography (GLC) and mass spectrometry (MS) should be used to validate new methodologies.

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3. Chemical and enzymatic reactions that degrade trichothecenes to form nontoxic products should be investigated. The chemistry of the sterically protected epoxide should also be studied.

4. Methods of reclaiming trichothecene-contaminated commodities by transforming them into useful foods, feeds, and products should be developed.

5. Studies should be conducted to establish the persistence, leaching, and products of nonbiological and microbial degradation of trichothecenes in different types of soils and waters. The persistence of these products should also be determined. Information is required on the uptake by plants growing in contaminated soils and on the behavior of trichothecenes in terrestrial and aquatic food chains.

6. To determine the biological effects of T-2 toxin and other trichothecenes, studies should be conducted on (1) the kinetics of absorption, tissue distribution, and toxicity following topical and inhalation exposures under a variety of environmental conditions; (2) the effects produced by simultaneous exposure by multiple routes (e.g., topical, oral, and inhalation); (3) the effects of continuous and intermittent long-term exposures; and (4) the effects produced by combined exposure to trichothecenes and other mycotoxins. These studies should include clinical, clinicopathological, immunological, morphological (i.e., gross, microscopic, and ultrastructural), and functional evaluations. Effects on the cardiovascular, central nervous, and immune systems should be examined in these studies as

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should effects on known target organs and tissues, including the skin, gut, lymphoid tissue, bone marrow, and gonads.

7. Investigations are needed to identify the best methods for preventing exposure through the use of protective barriers and decontamination procedures.

8. Research is needed to develop methods for reducing the toxic effects of trichothecenes. Studies should be focused on processes that will prevent absorption of the toxin, reduce its binding to ribosomes, and increase its rate of degradation and elimination.

9. Studies should not be limited to protection against the effects of trichothecenes but, rather, should extend to protection against other potent biologically produced toxins.

10. The continued use of nonmilitary scientific advisors in military research programs is encouraged. After reviewing new data from current research efforts and examining new techniques, the committee recommends that the military draw on the wide expertise which is available in the scientific community, inorder to take full advantage of new scientific discoveries and techniques as they are developed.

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Sheehan –
mm 078

August 22, 1984

Dr. John C. Sheehan
Department of Chemistry
Massachusetts Institute of
 Technology
Cambridge, MA 02139

Dear John:

Except for the typo BW instead of GB for sarin, I don't see how your excellent letter can be improved. I enclose an interview with my colleague,Tom Seeley which you will enjoy reading.

In the "yellow rain" we have a case of correct science not being correct politics. Which will prevail?

It was good to see you and Marian the other night.

Sincerely,

Matthew Meselson

MM/db

Enclosures

8/24/84 Sheehan

Sir:

In the extensive reports and discussions concerning "yellow rain," some published in the Wall Street Journal, an important property of mycotoxins has been overlooked, namely the relatively low toxicity of this class of compounds. It is useful to compare the toxicity of the alleged active ingredients of "yellow rain" (chemically the tricothecene mycotoxins) with standard chemical warfare agents. The purportedly most toxic mycotoxin, T-2, has an LD_{50} of approximately 5.0 $^{mg}/_{kg}$ bw with various animals. The nerve gas GB (Sarin) has a toxicity of approximately 0.02 $^{mg}/_{kg}$. Assuming no significant species difference toxin T-2 would be between 100 and 1000 fold less toxic than the nerve agents. Expressed in another way, a dose of 350 mg of <u>pure</u> T-2 would be required for 50% lethality for the 70 kg "average person," a manifestly impractical level to achieve in field use.

In my opinion toxin T-2 most probably would not qualify as an effective antipersonnel agent, especially in a jungle setting. If one accepts this conclusion the question of whether mycotoxins have been used is moot.

John C. Sheehan
Professor of Chemistry
Emeritus
Massachusetts Institute of Technology
Cambridge, MA 02139

Constable

MASSACHUSETTS GENERAL HOSPITAL = HARVARD MEDICAL SCHOOL

556 1234
Barzilay.

JOHN D. CONSTABLE, M.D.
Plastic and Reconstructive Surgery

556- 1873

Office
Ambulatory Care Center 3A
Massachusetts General Hospital
Boston, Massachusetts 02114
617-726-2817

24 August 1984

Mr. Bob Barzilay
New York Times
229 West 43rd Street
New York, NY 10036

Dear Mr. Barzilay,

The undersigned, who have been closely involved in the study of the effects of chemical defoliants in Vietnam and of Agent Orange in particular, take exception to the editorial "The Truth about Agent Orange" in the New York Times of August 13.

We agree that it is uncertain as to whether there are any demonstrable health effects on humans as the result of exposure to the dioxin contaminant of the Agent Orange used in Vietnam. We are all too well aware of the difficulties in investigations such as these, but to state that it has been clearly demonstrated that there are no health effects is false.

It is agreed that the total amount of dioxin sprayed was probably at least 170 kg.--the amount given in the editorial--but we are unaware of any scientific evidence that 95% of this stayed, even initially, in the forest canopy. In any case, this figure is totally irrelevant, since, at least whenever an effective defoliation had been achieved, most of the dioxin would soon have reached the ground.

The human significance of the food chain concentration of dioxin has not been proven, but dioxin has been shown to be present in fish and in human milk two years after the cessation of spraying. Of course, the possibility of a prolonged exposure through food is more likely to be signficant among the Vietnamese than among U.S. soldiers. Nonetheless, as reported this year by Professor Michael Gross of the University of Nebraska, dioxin was detectable in the body fat of some U.S. Vietnam veterans sampled many years after the cessation of spraying.

To say that "complaints about Agent Orange didn't begin until six years after spraying ceased" is false. The late Dr. Ton That Tung was impressed by apparent increases in liver cancer and congenital anomalies--an increase which he ascribed to the effect of herbicides --by the middle 1960's, several years before spraying ceased. It was partly in response to such concerns that the American Association for the Advancement of

Science Herbicide Assessment Commission, of which two of the undersigned were the active medical members, was sent in 1970 to explore the medical and economic effects of herbicide use in Vietnam.

Studies of the unfavorable outcomes of pregnancy (miscarriage, congenital anomalies) among North Vietnamese women whose husbands served in the South and were therefore variably exposed to Agent Orange do show statistically valid increases in comparison to those found in women whose husbands stayed in the North. Contrary to the opinion given in the editorial, an increase in congenital anomalies "widespread throughout the population" may be just as significant as an increase in a rare anomaly. Not every toxin manifests itself in such a sensational way as phocomelia.

The study of the pilots who did the spraying (Operation Ranch Hand) was not entirely negative and did, in fact, show some potentially significant changes in health problems among them. It would now seem in order to determine if any such problems can be correlated with dioxin residues in the body fat.

It may well be that no health effects resulting from exposure to dioxin will in fact ever be indubitably demonstrated among American veterans, but we believe that the present evidence does not justify the editorial conclusion that there is "no reason to suppose that veterans...have any symptoms for which dioxin might be the explanation."

Yours sincerely,

John D. Constable, M.D.
Associate Clinical Professor of Surgery, Harvard Medical School; Visiting Surgeon, Massachusetts General Hospital

Peter Shaw Ashton
Arnold Professor of Botany;
Director, Arnold Arboretum, Harvard Universi

Maureen C. Hatch
Asst. Professor of Epidemiology
Columbia U. School of Public Health

Matthew Meselson
Professor of Biochemistry
Harvard University

JDC / sc

Dear Matthew,

In the rush of Heyndrickx' congress you seem to have forgot to give me your report on your trip to thailand. Is it possible to send me a copy of it. I am also very interested in the results of the analyses which have been done on the samples of "yellow rain" you brought with you from Thailand. Concerning the report of the Thai assistent it seems impossible to get hold of it. She was sacked for here doctorial thesis. Here thesis was reviewed the day after the congress ended by the readingcomission made up of proof. of the faculty of pharmacy of the university of Ghent. They found it (6 to 2) not good enough to be defended before the jury because it contained nothing new in the field of scientific research. They also ~~expected~~ suspected fraud although they couldn't prove it. Wat is suspect is that here thesis was finished in the beginning of may so that it could be defended before the reading commision the day after Heyndrickx' congress. Which meant that he controlled that girl to the last day of the congress. From the Dutch scientist Benschop (Rijswijk) i heard that someone gave Heyndrickx some blanc samples t analyse. Heyndrickx also claimed to have found mycotoxin on these samples. This information was confirmed by De Bisschop of Belgium. Could it be that the Pentagon check him? If you have some more information on this, please me know. The interview i made will be published in sep a magasine called Intermediair. As soon as it is publ will send you a copy.

Greetings

Willy Van Damme
Larendries 44
B-2688 St. Amands
Belgium

Sent 9-13-84

Oberg
Yellow Rain
(Meselson's
Office)

Algiers, September 14, 1984

Professor M Meselson
Department of Biochemistry
and Molecular Biology
Harvard University
7 Divinity Avenue
CAMBRIDGE, MA 02138

U S A

Dear Matthew,

Thank you, indeed, for your kind letter of April 6 which arrived by today!

I am about to write an article in one of the Swedish papers on the subject and I will feel free to quote you extensively on the matter.

Have you received any news from Laos? I wrote to Kaysone in March to remind about my various demarches in your favour but I am without any reply from Vientiane.

I saw Emma briefly in Stockholm. She turns more and more Swedish and we love to have her so often with us in Sweden.

I cannot see any real professional reason for you to come to Algiers but you should know that Birgit and I would be delighted to see you with us. The guest-room is quite decent, the Sahara fascinating and the wine cellar still well supplied.

Best regards,

Jean-Christophe Öberg

Copy sent w/ permission of Dr. Knight. Chasson
DSE
9-19-84

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
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14 September 1984

Dr. Robert Chasson
University of Denver
Department of Physics
University Park
Denver, Colorado 80208

Dear Bob:

I had been following the series of yellow rain letters and news articles in Science, so it was interesting to read the material you sent. It certainly is an interesting example of the interaction of science and politics.

With regard to Meselson's question, the answer is a qualified "no." (It's too bad everything has to be qualified, isn't it?) Particularly when one is dealing with rare events, one's estimation of "reasonable upper limits" for things like dust particle concentration in air may not apply very well. I don't quite understand the last sentence in Meselson's letter. Coagulation rates of dust particles in air are highly dependent upon concentration, but also upon size. Even if the raindrops pick up aggregates of original dust particles, the dust might very well redisperse within the drops or upon their surfaces, so as to give a distinct color. (Drop a little clump of talc particles on water, for instance.)

Muddy rain associated with dust storms is not terribly rare (or such is my impression without doing some sort of literature search). If that's true, then whatever "theoretical limit" there might be, based upon whatever set of assumptions, should allow for the possibility of colored rain from the scavenging of dust.

Nancy is in Siberia right now. She'll be back (presumably) in 10 days or so, with a new set of tales.

Regards,

Charlie

Charles A. Knight

CAK:sb

note: Knight is one of the world's ranking experts on atmospheric condensation processes.

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