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Subject RADIOACTIVITY HEALTH HAZARDS - HANFORD

Copies 6 Whitaker

*Pratt*

By R. Williams

To Memo

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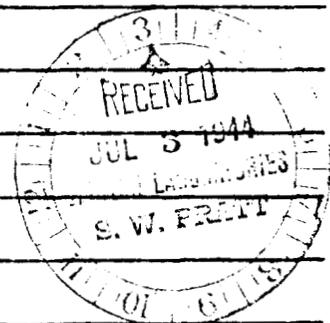
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Human Studies Project

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- 1,2,3: Major General L. R. Groves
- 4,5: Dr. A. H. Compton
- 6: Dr. M. D. Whitaker
- 7: Mr. W. O. Simon
- 8: Dr. G. M. Gehrmann
- 9: File: E. B. Yancey  
J. H. Tilley  
A. W. Sherry  
G. H. Greenwalt  
R. M. Evans
- 10: Chronological file

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it all

June 26, 1944

**MEMORANDUM**

**RADIOACTIVITY HEALTH HAZARDS - HANFORD**

Last year, when organization and personnel for handling radioactivity health hazards at Hanford were being considered, it was concluded that

1) Two physicians from the Du Pont medical staff should undertake training under Dr. Stone and Dr. Cantril of the Metallurgical Laboratory. Dr. Norwood (later appointed Medical Director at Hanford) and Dr. Fuqua (still in training at Clinton) were promptly assigned for this purpose.

2) With these physicians and their training provided, and with Dr. Stone and Dr. Cantril available for consulting services to Hanford, it would be unnecessary (in the face of an extreme shortage of competent roentgenologists in the country) to employ an experienced roentgenologist for the Hanford medical staff.

3) A "health physicist" would be needed, familiar with the Hanford process and its health hazards by work at the Metallurgical Laboratory and at Clinton, capable of directing the use of instruments to detect and determine radioactivity health hazards, and experienced in working with a roentgenologist to interpret the results of instrument measurements. Such a man was available in Dr. Parker, now at Clinton, who had worked with Dr. Cantril before as well as on the Metallurgical Project. Accordingly, it was arranged that he go to Hanford as head of the "health group" in the Technical Department, and that he be provided with the necessary facilities and personnel for his work at Hanford.

When these decisions were made, the most extreme health hazard in the project had not been uncovered. This hazard is the product itself. It is now estimated that five micrograms (0.000005 grams) of the product, entering the body through the mouth or nose or by skin absorption, will constitute a lethal

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dose. The poisonous effect of the product is cumulative, i.e., product entering the body is permanently absorbed and effective, like radium. As soon as the superpoisonous nature of the product was appreciated, extra provisions were undertaken for handling it at Hanford, e.g., extraordinary separation, subdivision and ventilation of final product isolation facilities, avoidance of handling, storing or shipping final product in dry form (except for absolutely necessary sampling for analysis), etc. However, whereas prior to the uncovering of the superpoisonous character of the product it seemed reasonable to expect that Hanford might operate without casualties (due to conservative provisions for radiation shielding and remote control of apparatus in the 100 and 200 Areas), now it began to be apparent that inasmuch as the small quantities of final product to be produced must be handled for purification and analysis by men working close to them, there must be faced the real possibility of product-poisoning cases needing detection and continual observation and care by a skilled, experienced roentgenologist.

Meanwhile the final product isolation process under development at Clinton had only slowly been carried successfully to the point where design of product isolation facilities could be undertaken. Consequently, it had been clear that the product isolation building at Hanford would be late in completion. This did not appear important because, when operating to deliver product in 18-kilogram units, starting with virgin metal charged into the first pile, a relatively long period of pile operation, pile-product storage and recovery plant operation--all at levels approaching normal rated capacity--would have to precede the beginning of isolation of the final product.

At this juncture it developed that Hanford should operate to produce first an "experimental lot" of product (2-3 kilograms). This has altered the situation materially. If Hanford is reasonably successful in initial pile and recovery plant operations headed at the "experimental lot" goal, it will be almost certain to be necessary to isolate the "experimental lot" of product in small batches in makeshift laboratory facilities because of the unavailability in time of the product isolation building which is only now being designed and constructed. Moreover and even more important, "experimental lot" production will bring about an entire change in operating psychology at Hanford. In working toward the production of an initial 18-kilogram lot, it would be absolutely necessary and clearly recognized as such, to bring the plant to a state of steady high-level operation, i.e., to begin operations in about the same way that one would begin the operation of a commercial plant. On the contrary, when striving to produce the 2-3 kilogram "experimental lot", it will be realized by all concerned that this lot can result from putting together the "bits and

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pieces" coming from relatively intermittent and low-level initial operation. In consequence, in spite of all that supervision can do to insure safe operation, there will be corner-cutting and chance-taking particularly in pile discharge and maintenance, in recovery plant maintenance, and in operation and maintenance of facilities for processing product after it leaves the "canyons".

These considerations make it evident that, contrary to the original plan, there should be an experienced roentgenologist at Hanford as soon as its operation begins. The matter was discussed by Mr. Williams with Dr. Compton and Dr. Whitaker by telephone beginning immediately after Mr. Greenwalt's receipt of information regarding the "experimental lot" requirement from Dr. Conant, Dr. Oppenheimer, and Dr. Tolman in Washington on May 19. On June 1 the matter was discussed with Dr. Compton, Dr. Stone, and Dr. Hilberry by Mr. Williams in Chicago. It was generally agreed that it would be desirable for Dr. Conrill to leave his work at Clinton and go to Hanford were it not for the fact that he is engaged in attempting to safeguard at Clinton some operations with highly radioactive materials which are vital to the whole Manhattan District undertaking. Dr. Compton and Dr. Stone undertook to secure another experienced roentgenologist who, after training at Clinton, might be available for either Clinton or Hanford purposes.

Such a man was discovered in Dr. Wirth, now roentgenologist at the U. S. Marine Hospital at Bethesda, Maryland. Dr. Wirth's transfer to Manhattan District work was arranged by Dr. Compton and Dr. Stone with Surgeon General Parran, and Dr. Wirth is being employed by the Metallurgical Laboratory and will shortly report at Clinton. Along with Dr. Wirth there has been secured Dr. Rose, a "health physicist" who has long worked with Dr. Wirth. Inasmuch as Clinton does not need Dr. Rose--having trained Dr. Morgan to take Dr. Parker's place--Dr. Rose will be employed directly by the du Pont Company and will go to Hanford following a training period of a month or more at Clinton.

The requirements for roentgenologists at both Clinton and Hanford were discussed by Mr. Yancey and Mr. Williams with General Groves in Washington on June 16 and again by Mr. Yancey and Mr. Williams with Colonel Warren in Wilmington on June 20. On June 23, Dr. Compton, Dr. Whitaker, and Mr. Williams, in discussions in Wilmington, worked out the time-location table shown on the attached sheet for the three roentgenologists (Drs. Stone, Conrill, and Wirth) and the three "health physicists" (Drs. Parker, Rose, and Morgan) now available for Clinton and Hanford work.

The table shows that Dr. Parker will go from Clinton to Hanford immediately (together with Dr. Fuqua), there to complete

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the preparations for handling health hazards peculiar to the Hanford process, working with the Medical, Technical, and Production Departments at Hanford with the advice and assistance of Dr. Stone who will spend much of the months of July and August at Hanford for this purpose. On account of the inclusion of a roentgenologist in the Hanford staff (first Dr. Cantrill, perhaps later Dr. Wirth), Dr. Parker and the men reporting to him will be incorporated in the Hanford Medical Department (instead of the Hanford Technical Department), reporting to Dr. Herwood through the roentgenologist who will become an Assistant Medical Director. Consideration has been given to organization of health hazard work as an entirely separate department at Hanford, reporting to the Assistant Plant Manager, but it has been concluded that for administrative reasons (particularly to relieve the roentgenologist of considerable routine) it will be better to include him and his group within the Hanford Medical Department. This department will now be headed by Dr. Herwood as Medical Director with the roentgenologist as one Assistant Medical Director handling the health hazards peculiar to the Hanford process, and with a second Assistant Medical Director, Dr. Williams (the present single Assistant Medical Director), handling all other medical matters.

The use of Dr. Stone at Hanford during July and August is necessitated by the facts that Dr. Cantrill cannot be spared from his present work at Clinton before early August and must thereafter, before arrival at Hanford, take an urgently needed vacation. Dr. Cantrill will therefore report at Hanford September 1, with somewhat more than two weeks and less than a month's vacation behind him. At that time Dr. Stone will return to his regular duties in oversight of all health matters at Chicago and Clinton, making nevertheless frequent consultant visits to Hanford.

As before stated, Dr. Wirth will go into training at Clinton immediately he is able to report for work there. It is anticipated that he can substitute for Dr. Cantrill satisfactorily in Dr. Cantrill's present work in time for Dr. Cantrill's vacation. He will continue in Dr. Cantrill's place at Clinton while Dr. Cantrill is at Hanford. Late in the year Dr. Wirth will begin a program of visits to Hanford to become acquainted with conditions there. At the end of the year or thereabout, depending upon circumstances prevailing at Hanford at that time, consideration will be given to returning Dr. Cantrill from his employment at Hanford by the du Pont Company to Clinton, with accompanying employment of Dr. Wirth by the du Pont Company and his transfer to Dr. Cantrill's position at Hanford.

It is the opinion of Dr. Compton, Dr. Stone, and Dr. Whitaker that while Dr. Cantrill will be the better man for Hanford in the immediate future--because of his experience during

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the Clinton start-up and his long connection with the Metallurgical Laboratory Project--Dr. Wirth will better administer the health hazards organization at Hanford after he has had sufficient training at Clinton. A second opinion even more strongly held is that Dr. Rose will prove to be a better "health physicist" for Hanford than Dr. Parker. Accordingly the time-location table recognizes the possible departure of Dr. Parker from du Pont employment at Hanford by about November 1 and the substitution of Dr. Rose in Dr. Parker's place following Dr. Parker's return to Clinton at that time. This move, like the Hanford-Clinton exchange of Dr. Cantril for Dr. Wirth, will be considered on its merits in the light of circumstances prevailing at Hanford toward the end of the year.

RW:NBS

Roger Williams

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	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Stone	W*	W*	NP**	NP**	NP**	NP**
Cantril	X	X	W	W	W	W
Wirth	X	X	X	X	X**	X**
Parker	W	W	W	W	X	X
Rose	X	X	W	W	W	W
Morgan	X	X	X	X	X	X

W = At W

X = At X

NP = At Chicago and X

\* = Intermittent

\*\* = Making visits to W

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