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FROM : Douglas Grahn, Biology Branch

DATE: March 23, 1959

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D. Grahn

SUBJECT: TRIP REPORT TO UNIVERSITY OF WISCONSIN, MADISON, TO VISIT CONTRACTORS CHAPMAN, POTENTIAL CONTRACTOR CROW, AND THE GRAND OLD MAN SEWALL WRIGHT

The Chapman program involving the effects of cumulating radiation over a number of generations in rats is slowly getting under way. They are exposing weanlings to whole body 2 MEV x-radiation, holding them for 30 to 60 days then putting them into mating. They wish to use only one dose but have not fixed on this dose since sterility is rather high after 300 r or more to young males. I suggested they wait about a month longer before irradiation to possibly avoid excessive sterility. The original program called for irradiating females in one part of the experiment but at present they are not sure if this aspect can be handled. They also had indicated that life expectancy data would be obtained on the progeny of irradiated parents, but this seems to have been a misunderstanding. However, they could probably not handle it because of lack of space. The program is really the work of Morton and Crow; Chapman is merely carrying out their ideas. Consequently, the success of the program will depend heavily upon the presence of both Morton and Crow for the duration of the study.

Dr. Crow, in collaboration with Dr. Newton Morton, is planning to submit a research proposal that will test the lethal equivalent hypothesis that was developed by Morton for the study of consanguinity in man. They will test this hypothesis in *Drosophila* but plan to have certain human studies running at the same time. I have a preliminary outline of the proposal which is rather complex but typical of the imaginative thinking of both Morton and Crow. I strongly urged them to submit this proposal as soon as possible and all but committed the Division to their support which in this instance I believe is virtually imperative.

I had the good fortune of having lunch and a brief discussion afterwards with Sewall Wright. He believes there are two major problems in radiation genetics and human genetics. For one he feels that we must find out what the component of genetic variability is in human populations. Then we must determine what are the optimum frequencies of various genotypes in the human population. If there is an optimum diversity of genotypes and we are at that optimum now increases in the mutation rate will be entirely detrimental and readily measurable. If, however, we are not yet at this optimum or if this optimum should itself vary with social and cultural changes it

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becomes exceedingly difficult to predict exactly what an increased mutation would do to a human population. For a brief period there could be an accumulation of mutations that would hasten the approach to an optimum frequency if a given phenotype is the result of a heterozygous state. With respect to experimental radiation genetics the information he feels we need is of a similar nature to that needed in man. We should expand our efforts to determine the effects of mutation upon such characteristics as growth, fertility, life expectancy, intelligence, etc. As a sidelight he told a rather interesting story of a statistical test done by him at Beltsville, Maryland, some 40 years ago. This concerned the value of committees and their ability or inability to make decisions. The test involved a problem of grading wool by either a committee of three or by three individuals working independently. The results: individuals are nine times as efficient as committees in reaching decisions.

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