

GENERAL HEADQUARTERS
SUPREME COMMANDER FOR THE ALLIED POWERS
Public Health & Welfare Section
Atomic Bomb Casualty Commission
APO 500

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15 July 1949

TO: Committee on Atomic Casualties, National Research Council

FROM: James V. Neel, Consultant in Genetics

SUBJECT: Report on Activities in Japan During the Period
8 May 1949 to 13 July 1949

1. The chief activities of the undersigned during the period covered by this report were as follows:

- a. A review of all phases of the genetics program.
- b. Preparation of a Tables of Organization for the genetics program (see appendix A).
- c. Completion (with R. Brewer and D. Geathard) of a code to be used in the machine analysis of the data of the genetics questionnaires.
- d. Coding (with I. Kodani) for machine analysis that section of the 6,520 genetics questionnaires accumulated in 1948 which is concerned with the occurrence of abnormality in the newborn. Approximately 3,000 additional questionnaires involving early 1949 terminations were also coded.
- e. Reexamining (primarily with S. Kitamura, K. Takeshima and W. Sutow) some 58 children in whom a diagnosis of congenital abnormality had been made previously, with a view towards ascertaining the present reliability of reporting (see Appendix B).
- f. Working out (with R. Brewer) an outline of the first tabulations to be performed on the 1948 data, and preliminary analysis of the results of these tabulations (with W. Schull and H. Luykx).
- g. Preparation (with A. Cuthbert) of a documentary film on the activities of the genetics program.
- h. Efforts to improve the quality of the data now being collected through.

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- (1) Attempts (unsuccessful) to locate and employ qualified Japanese Nationals on an Assistant Professorship level.
 - (2) Attempts (partially successful) to establish a working system of Japanese consultants.
 - (3) Participation in the training of genetics follow-up physicians.
- i. Completion (with M. Kodani and R. Brewer) of a manuscript on consanguinity in Japan.
 - j. Attempts to improve the quality of the reports concerned with newborn weights through procurement of standardized scales and arrangement for distribution of same to midwives.
 - k. Attempts (with Lt. Col. Tessmer and R. Kurata) to initiate an autopsy program in Nagasaki (Memo for Record dated 6 June 49, subject: Autopsy Program in Nagasaki).
 - l. Completion (with the Construction Group) of plans for rehabilitation of the Hiroshima and Kure pregnancy registration centers (Memo for Record dated 1 July 49, subject: Pregnancy Registration Space in Hiroshima and Kure).
 - m. Preparation (with P. Green) of an explanatory leaflet to be distributed at the time of their registration to all pregnant women coming within the scope of the ABCC program.
 - n. Attempts (with S. Kitamura, M. Suzuki, E. Engle, and Lt. Col. Tessmer) to initiate a program for the study of as many early pregnancy terminations as possible; this program, dealing primarily with terminations occurring in months 2 - 5, will supplement the present program, which, with rare exceptions, does not begin to function until the 5th month of pregnancy has been reached. (Memos for Record dated 24 June 49 and 1 July 49, subject: Conferences with Dr. K. Nagata).

2. It appears to the undersigned that the chief problems involved in the collection of pregnancy termination data in Japan have now been met and solved so far as the mechanics of this collection are concerned. The present pressing need is for an improvement in the quality of the data being collected. Any such improvement revolves primarily on the number and ability of the personnel involved in the work. The following specific recommendations are made at this time:

- a. That the Tables of Organization for the genetics program which are the subject of Appendix A be adopted, and that every effort be made to bring the program up to full strength at the earliest possible moment. This would mean the employment in

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Japan for the genetics program of a minimum of some nine key American personnel (present number - 4).

- b. In the ultimate analysis the most important factor in the quality of the data being obtained is the caliber of the young Japanese physicians who examine each pregnancy termination. At the present time these physicians do not have their headquarters with the rest of the group in Hiroshima and Kure, but are housed in the Hiroshima Red Cross Hospital and the Hiroshima Medical College (Aga) respectively. This is an arrangement of convenience dictated by the facts that (a) there is a marked space shortage in the main (temporary) installation and (b) about half these physicians are on half-time status, devoting the remainder of their time to the above-mentioned groups. It is very strongly recommended that as soon as the permanent installations are completed, those groups be assigned space therein, and only full-time physicians be employed. The bulk of the working time of these physicians is occupied with riding about in jeeps trying to locate the address of newborn babies (the Japanese system of numbering streets is impossible), with nine-tenths of the babies proving upon examination to be completely normal. This is not professionally exciting work. In recognition of this fact, these men are allowed half their time for "professional advancement". They occupy this for the most part with the study of Japanese texts and periodicals. It is recommended that as rapidly as possible weekly clinics, lectures, clinico-pathological conferences, etc., be developed in order to further the training of these men. Such a training program will not only stimulate interest but also contribute to a very desirable improvement in the level of professional competence. It is felt that the salary scale followed up to the present time has been on the low side and that a revision upwards is indicated. Only with these changes can we expect to attract--and hold--capable young men.
- c. The ABCC has not yet reached that stage where it can interest in the necessary numbers competent older Japanese physicians with a university background or its equivalent, men of such a caliber that they could exercise a type of supervision over the younger physicians. Quite aside from the question of professional facilities and confidence in the organization, there are the practical matters of housing, salary, sick and retirement allowances, etc., to be settled. Theoretically, the employment in each of the three study areas of a Japanese National with a good academic background in pediatrics is highly desirable. However, an unfortunate appointment would be worse than no appointment. It is recommended that the search be continued for such persons, but that extreme caution be exercised in any appointments.

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- d. All possible steps must be taken to increase our liaison with the midwives, and to build up among them an "esprit de corps" in matters pertaining to the ABCC.

3. It is a pleasure to acknowledge the aid and assistance so freely offered during the past several months by all members of the Commission, and especially by the Director, Lt. Col. C. F. Tessmer, and by the present members of the genetics group: Mr. Richard Brewer, Dr. Masuo Kodani, Dr. R. Kurata, Mrs. D. Geathard.

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Genetics Consultant

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APPENDIX A

TO: Committee on Atomic Casualties, National Research Council

FROM: James V. Neel, Consultant in Genetics

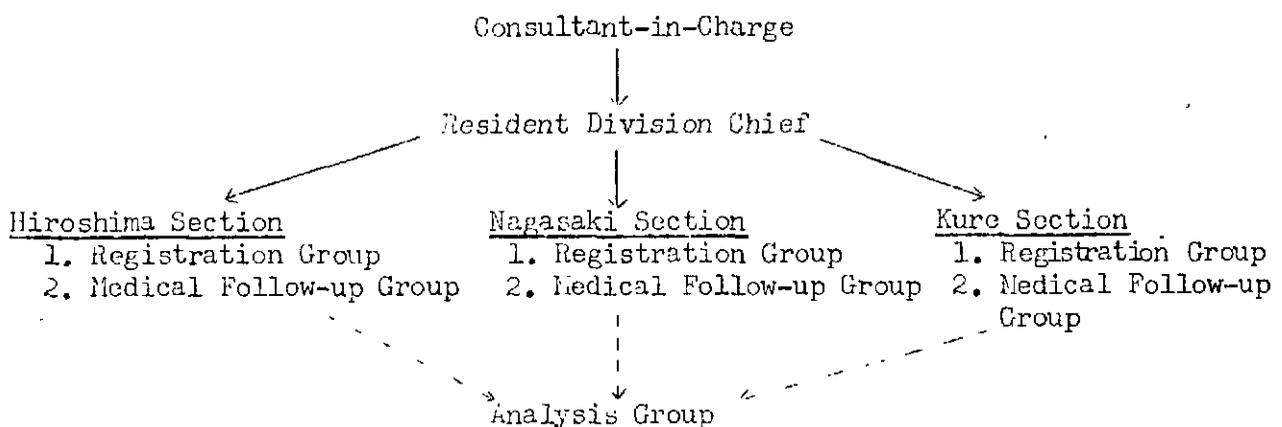
SUBJECT: (a) Memorandum concerning the Tables of Organization for the Genetics Section of the Atomic Bomb Casualty Commission

(b) Evaluation of personnel requirements in the light of the proposed Tables of Organization

1. For the past two and one-half years an attempt to organize a suitable program of research on the possible genetic effects of the atomic bomb has been in progress under the general guidance of the undersigned. The theoretical considerations underlying such a program, the general outline of the work, the many obstacles to be overcome in obtaining the desired data, and the progress to date have been sufficiently reviewed elsewhere.

2. Because of the essentially uncharted nature of this activity the proper organization of the necessary personnel was not at first clear. It is now felt that the accumulated experience to date has been sufficiently extensive that a basis has been reached for a workable Tables of Organization for the Division.

3. The proposed organization can be depicted diagrammatically as follows:



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4. The chief functions of the Registration groups will be to register each pregnant woman in Hiroshima, Nagasaki, and Kure at as early a stage as possible, to assemble the midwives' reports on pregnancy terminations and transmit same to physicians for appropriate follow-up studies, to clarify through correspondence or through the Medical Follow-up Group missing, incomplete, or ambiguous items, and to maintain files on overdue pregnancy terminations, plus such other responsibilities as are necessary to the mechanics of data collecting. All three registration groups will be under the supervision of a Statistician. Each of the three groups will be composed of registration clerks, "verifying clerks", file clerks, etc., in sufficient numbers to process to completion the 20,000 or so "screening" questionnaires and the 2,000 or so "long" questionnaires which are expected to accumulate each year.

5. The function of the Medical Follow-up Group will be to obtain accurate data on each pregnancy termination in Hiroshima, Nagasaki, and Kure. Each group will be composed, where possible, of at least one American pediatrician (or other qualified individual), at least one geneticist, and a sufficient number of young Japanese physicians to make a careful examination of each pregnancy termination feasible. It is felt that the first goal of the Medical Follow-up Group should be an adequate examination of each product of conception as soon as possible after birth. A secondary goal should be a reexamination of each surviving child at 1 - 1½ years of age, for confirmation of previous diagnoses, and to detect congenital defects not readily apparent at birth (defects of vision and hearing, blindness, etc.). If this latter goal is achieved, the services of at least two and possibly three additional pediatricians will be essential.

6. The Analysis Group will have as its function the processing of the data. This includes the coding and the preparation for machine tabulation of the genetics records. It will be under the general supervision of the Statistician and under the immediate supervision of a Tabulations supervisor, who will have the necessary accessory personnel to ensure the prompt machine analysis of the data as questions pertaining to the data arise.

7. There exist a number of special positions essential to the proper conduct of the program, the nature and duties of which will vary from time to time. At the present time only one such exists--this concerned with the conduct of studies on early abortions prior to pregnancy registration.

8. The chief positions included in the Tables of Organization may be briefly defined as follows:

- a. Consultant-in-Charge. Assumes over-all responsibility for the conduct of the program for a period of 10 - 20 years.

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takes periodic visits to Japan to examine all phases of the genetics work, and in the interim receives regular reports of a nature designed to keep him so informed that he can as need arises represent the immediate picture to the Committee on Atomic Casualties. Such an individual should have a medical degree plus special training in genetics.

- b. Resident Division Chief. Assumes immediate responsibility for the conduct of the work in Japan. This includes the necessary checks on the administration of various phases of the program, the employment of local personnel, general supervision of the training of Japanese physicians, etc. He is especially responsible for seeing the uniform procedures and standards prevail in all three study areas, and that the data obtained have the necessary accuracy. Appointed on a two-year basis. Primarily a physician, but special training in genetics desirable.
- c. Statistician. Responsible for the proper functioning of the Registration and Analysis groups. This includes supervision of such functions as the initial registration of pregnant women, the collection of midwives' reports for transmission for verification to the Medical Follow-up Group (aside from reports of abnormal terminations, which may go directly to the Medical Follow-up Group), and the completion of missing questionnaire items and the verification of ambiguous entries through correspondence or personal visit. He supervises the coding and analysis of the data, performing such routine and special tabulations as may be requested by the Consultant-in-Charge or the Resident Division Chief. In the performance of these responsibilities he may require a Field Supervisor in each of the two principal study areas. Such a person should be selected primarily on the basis of training and experience in the field of vital statistics. Appointment on a two-year basis. Such an individual may, as the occasion warrants, assume other duties within the framework of the ABCU.
- d. Tabulations Supervisor. In charge of the preparation of the completed questionnaires for machine analysis, and the performance of such tabulations as may be requested by authorized personnel.
- e. American pediatrician in the Medical Follow-up Group. Responsible for the verification of all diagnoses of abnormal terminations, plus spot checking a sufficient number of terminations reported as normal to satisfy himself of the necessary diagnostic accuracy. Responsible for coding those entries on the screening or follow-up questionnaires concerned with the

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diagnosis of abnormality in the newborn. Participates in the training of the follow-up physicians. Should be an M.D. with advanced training in pediatrics. It is felt that usually one individual in each study area will be sufficient to supervise the examination of the newborn infants, although under special circumstances and for limited periods of time two may be necessary. In the event that an attempt is made to reexamine all children at the age of 1 - 1½ years, then one or two additional American pediatricians, plus perhaps four or five Japanese pediatricians, will be necessary for each study area. It may prove advantageous to rotate these individuals through other phases of the ABCC program. Although each person is responsible for coding the reports originating in the study area to which he is assigned, before any formal statistical treatment of the data is undertaken, a conference must be held or suitable steps taken to ensure uniformity of diagnosis.

- f. Geneticists. Responsible for checking all reports of abnormal terminations from the standpoint of genetic interest, and for requesting and supervising special studies when these are necessary. For the present, responsible when special studies are performed for seeing that there is clear cross-reference from Genetic Questionnaire to Master File. Participates in the statistical analysis of the data. May be either a Japanese National or an American. The services of two geneticists may be necessary in some areas, especially if one of them, with the permission of the Director of Field Studies and the Consultant-in-Charge, becomes deeply involved in special studies.

Any or all of these persons may carry out special studies in line with his especial interests after permission from the Director of Field Studies and the Consultant-in-Charge.

9. At the present time the Genetics Section is manned as shown below:

Consultant-in-Charge: James V. Neel

Resident Division Chief: --

Registration Group:

Statistician: Richard Brewer

Tabulations

Supervisor: D. Geathard

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Medical Follow-up Group:

	<u>Hiroshima</u>	<u>Kure</u>	<u>Nagasaki</u>
American Pediatrician	--	--	R. Kurata
Japanese Pediatrician	K. Takeshima	--	--
Geneticist	--	M. Kodani	--

Special Study Group:

Early abortions: S. Kitamura

10. It is obvious that as projected the Genetics Section is woefully undermanned. The many gaps in the organization must be filled as rapidly as possible if data of the desired accuracy are to be obtained. It is recommended, after consultation with the Director of Field Studies for the ABCC, that such disposition be made of personnel now under contract with the Committee on Atomic Casualties, or (in the case of Army personnel) probably to be assigned to the ABCC, as to bring about the following situation:

Consultant-in-Charge: J. Neel
 Resident Division Chief: M. Yamazaki
 Registration Group:
 Statistician: Richard Brewer
 Tabulation Supervisor: D. Geathard

Medical Follow-up Group:

	<u>Hiroshima</u>	<u>Kure</u>	<u>Nagasaki</u>
American Pediatrician	Yamazaki	MacDuffy	Poole - Kurata
Japanese Pediatrician	Takeshima	--	--
Geneticist	Schull	Kodani	--

Special Study Section:

Early abortions: S. Kitamura

11. Should these recommendations be accepted, the chief gaps to be filled pertain to Japanese pediatricians. There are none such employed in the Genetics Division at the present time (Dr. Takeshima is primarily a surgeon). Suitable individuals should have the training and background implied in an Assistant Professorship. It is especially important that no mistakes be made in filling these posts. It is felt that for a number of reasons the Commission has not yet reached that stage in its development where it can attract for the Genetics Program Japanese who are in the 35-45 age group and who have the desired competence. It will probably be some time before the services of suitable Japanese pediatricians will be obtained.

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12. It is suggested that in the event Yamazaki, MacDuffy, and/or Poole be assigned to the project, each of them, after several weeks of orientation in all phases of the project, in addition to duties as outlined above, be assigned the problem of checking over all 1949 terminations reported to date, verifying those which appear of dubious validity.

13. It is suggested that in the event Schull be assigned to the project, he first have a thorough indoctrination, and then be assigned the problem of ensuring, in cooperation with the Statistician, that there is clear cross reference between the Genetics and the Master File records which have accumulated during the first half of 1949. It is then recommended that he be assigned the problem of reviewing, together with the Statistician and the pediatricians, the operations of the Red Cross Hospital Office in Hiroshima, with particular reference to reorganizing the present card files there. It is suggested that he then assume the duties of geneticist in the Hiroshima area, devoting a portion of his time to data analysis, although until additional personnel are obtained for Nagasaki he will find occasional trips to the latter installation necessary.

14. For administrative purposes it will be necessary to designate some one person as responsible for the conduct of each of the three Medical Follow-up Groups. For the present, it is recommended that this be Dr. Kodani in Kure, Dr. Yamazaki in Hiroshima, and Dr. Kurata in Nagasaki. It is further suggested that Dr. Yamazaki, because of his background and interests, for the present assume the additional responsibilities of Resident Division Chief.

15. Bi-weekly meetings of the Statistician (or his designated representative), Tabulation Supervisor, the pediatricians, and the geneticists in the Kure-Hiroshima area, and in the Nagasaki area, to discuss such questions as may have arisen during the preceding week, would probably prove of considerable value.

16. The final analysis of the data will be carried out insofar as possible in Japan, although it is recognized that the Consultant-in-Charge may find it necessary, if and when questions demanding a prompt answer arise in the United States, to conduct certain secondary analyses in the United States. Responsibility for the conduct of the analysis of the data will be shared by the Statistician and the Geneticists; to the extent that his other responsibilities permit the Biometrician for the Commission will of course have free access to the data for such calculations as he finds necessary or wishes to engage in. It is recognized that this is a rather loose allocation of responsibility, but it is felt that for a variety of reasons no more definite arrangement is indicated at the present time, since so much revolves on the mathematical background of the individuals occupying these three positions.

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APPENDIX B

TO: Committee on Atomic Casualties, National Research Council
FROM: James V. Heel, Consultant in Genetics
SUBJECT: Evaluation of the Accuracy of Abnormality Reporting During 1948
and Early 1949

1. An attempt was made during May - July 1949 to evaluate the quality of the data which had been collected by the genetics program up to that time, with special emphasis on the 1948 data. To this end, some 58 reported abnormalities were seen. These were not a representative sample in that a special effort was made to see cases where the diagnosis was dubious.

2. Although there may be some quibbling over anatomical details, the diagnosis of major malformations is seldom in doubt, when adequate diagnostic facilities are available and suitable follow-up studies may be arranged. However, during 1948 good diagnostic facilities were not yet available, and it was a struggle to see each baby once, without the superimposed burden of follow-up studies. Of 17 cases definitely reported as grossly abnormal by genetics follow-up physicians during 1948 and early 1949 and seen by the undersigned, the occurrence of abnormality was verified in each case. In 12 additional cases where the occurrence of a major abnormality had been questioned, and which were especially selected for follow-up because of the uncertainty of diagnosis on the basis of a single visit (predominantly hydrocephalus and congenital hip dislocation), abnormality was definitely present in 2, absent in 4, while the question remained open for 6. The chief possibility for inaccurate statistics in the field of major external malformation lies in the birth of grossly abnormal children who are either dead at birth or die shortly thereafter, who are disposed of without being seen by our physicians, and who are then described to our investigators as "normal". It is impossible to estimate the extent to which this is taking place. This possible loophole can be plugged only by an extensive program of public education, an attempt to instill new loyalties into the midwives, very prompt follow-up studies, and an extensive autopsy program. It is not feasible at the present time to form a truly accurate evaluation of the accuracy of reporting of major malformation. It is the impression of the undersigned - an impression based on a combination of fact and surmise - that during 1948 and early 1949 major malformations (exclusive of heart disease, cystic fibrosis of the pancreas, atresia of the bile ducts, and other such internal malformations) were reported with an accuracy in the neighborhood of 80%.

3. In the diagnosis of minor external malformations there enters a very significant subjective element. A total of 29 babies for whom a diagnosis of minor malformation had been made were seen. A considerable discrepancy was encountered in the standards of Hiroshima and Kure on the one hand, and Nagasaki on the other. In the first two mentioned cities an attempt was being made to record all the very minor external malformations, which attempt was perhaps 80% effective. There was, if anything, a tendency to "over-diagnose" on the part of certain interns. Thus, on several occasions it was impossible to

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confirm the diagnosis of hypertelia, small papilloma, or hemangioma. On the other hand, in Nagasaki many minor abnormalities such as hemangiomas and naevi were not being diagnosed, and accuracy here was probably closer to 10 - 20 .

4. The diagnosis of internal malformation, of course, presents many problems. At present an attempt is being made to obtain autopsies on as many stillbirths and neonatal deaths as possible in Hiroshima and Nagasaki. This attempt has been underway for some time in Hiroshima, where some fifty autopsies have been performed to date by Lt. W. Wedemeyer, but has only recently been instituted in Nagasaki. Thus far shortages of personnel have prevented a similar undertaking in Kur. At present there is no way of estimating the frequency of gross internal malformations detectable at autopsy. If, over a ten year period, it is possible to accumulate some one thousand autopsies in each of the three areas, together with the radiation histories of the parents, perhaps a first approach to the question of the incidence and significance of internal malformations will be feasible.

5. Whatever the diagnostic shortcomings of the experience to date may be, it is felt these shortcomings are almost equally distributed between "irradiated" and control material, although one cannot exclude a possible greater tendency of irradiated parents to disclose an abnormality because of the "cut" offered by the atomic bomb. The comparison of the results obtained in these two groups appears to have a high degree of validity at the present time, even if the absolute level of diagnostic accuracy improves with the passage of time.

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