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HLF/H

P. O. Box E

8 March 1946.

Dr. George O. Gay,  
Division for Cellular Pathology,  
Department of Surgery,  
Johns Hopkins Hospital,  
Baltimore, Maryland.

BEST COPY AVAILABLE

Dear Doctor Gay:

Doctor Rekers has asked me to write you concerning the possible sources of high intensity radiation.

We would be very pleased to provide any research organization with materials which would be suitable for their purposes. Unfortunately, however, this program which would make this possible has been held in abeyance pending the development of an organization for this purpose, which is in turn contingent upon legislative action.

From my own personal experience, may I say that a good x-ray machine at short distances should provide you with approximately the intensity you desire. It is also conceivable that several grams of radium or the equivalent of a radio-active material like radio-sodium would serve your purpose. The shielding required for radio-active material would make it a difficult and unwieldy job, however. I would suggest that you look into the possibility of using a 500 or 600 kilovolt x-ray machine where the objects to be radiated could be brought close to the target.

I am sorry that we have not available as yet any radio-active material suitable for your purpose.

Very sincerely yours,

REPOSITORY Oak Ridge Oper.  
COLLECTION Records of Holding Area  
BOX No. Contracts Box 1 of 3 Bldg. 2714-H  
FOLDER Contracts W-7412-Eng 2  
W-7412-Eng 6

HYMER L. FRIEDEL,  
Lt. Col., Medical Corps.

Co: Dr. Rekers.

1155881

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M.R. Theisen, Analysas, 10-19-94



ARMY SERVICE FORCES  
 UNITED STATES ENGINEER OFFICE  
 MANHATTAN DISTRICT  
 OAK RIDGE, TENNESSEE

IN REPLY  
 REFER TO COPY

Thus far I have not heard from Dr. Warren. I have the feeling that he is so very busy at the present time that he will not get around to a consideration of my request for a long time. I have been collecting a little data from the Washington group and thus far, they have told me that a three-gram equivalent of radium can be made in ten hours using the Carnegie cyclotron. This refers particularly to radio active sodium and, to be sure, would involve very special procedures for proper shielding. In any case, I would like to hear from Dr. Warren when there is a suitable opportunity for him to examine the problem which I proposed to you when you were here,

GEORGE C. GEY, M.D.  
 Division for Cellular Pathology  
 Department of Surgery  
 Johns Hopkins Hospital  
 Baltimore 5, Md.

*Report for Peter  
 concerning Dr. Gey.*

*to  
 Gey  
 (Gey)  
 Gey*

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C  
O  
P  
Y

THE JOHNS HOPKINS HOSPITAL  
Baltimore 5, Maryland

28 December 1945

Dr. Paul E. Rekers  
The University of Rochester  
Rochester, New York

Dear Dr. Rekers:

Concerning the radiation work that we are so eager to carry on in order to clear up a few important points, I neglected to indicate to you that we would resort to the use of some filtration. In the past we have used radiation of a quality not greatly different from what one would get through a Thoreus filter. The use of unfiltered radiation at close range is to insure a way of getting high energy. A number of years ago, we went into this matter with the x-ray group at this institution and also of the Kelly Hospital. In each instance, we found that the shielding and housing were of such a character as to prohibit getting close enough to the target with our specimens. There was, however, an old machine of about 220 Kv at the Kelly Hospital which would allow us to place our material a bit closer. Runs of three and one-half hours or more were needed and this caused serious breakdowns. I do not recall at the moment what the objections were to the use of unfiltered radiation, but there were some objections which Dr. M. A. Tuve made. If I am not mistaken, we were asked to do all of our experiments as much as possible with radiation of the same quality so that our results obtained at different times could be favorably compared.

Concerning your item #2, i.e. the use of radioactive phosphorous or possibly iodine, we did not contemplate using either of them in the media directly but would attempt only to use the radiations much in the same manner as one would use a container loaded with radium. I was told a month ago by Dr. Cowie in a telephone conversation that they may have available in Washington at the Terrestrial Magnetism Laboratory a considerable quantity of radioactive phosphorous, but Dr. Cowie was not able to tell me at the time the quality of the radiation. We think this source might prove to be satisfactory. I worked with this group for several years back in 1935 and off and on through 1939. They were most eager to be of assistance. I have no idea what their future program will permit, and therefore, I appreciate very much your suggestion regarding the contact with Dr. Warren. I will not attempt at this time to outline the kind of application which we require, but will save it for a later communication. In brief, it is concerned first of all with the mutagenic properties of electro-magnetic radiation and in part with the differential susceptibility of normal, altered and neoplastic cells. We have some valuable data at the present time, but none of it is important enough to justify a continuation unless more intense sources are made available with an opportunity to use selected radiation so as to standardize the quality of the radiations.

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M.R. Theisen, Analysis, 10-19-90  
Date

-2-

I have read with considerable interest some of the statements given in H. D. Smyth's report on atomic energy and they suggest new approaches of interest. A lot of time is required to develop these sources and I will therefore appreciate immensely your continued interest and perhaps even your speculations when you are in the proper mood to lend a hand.

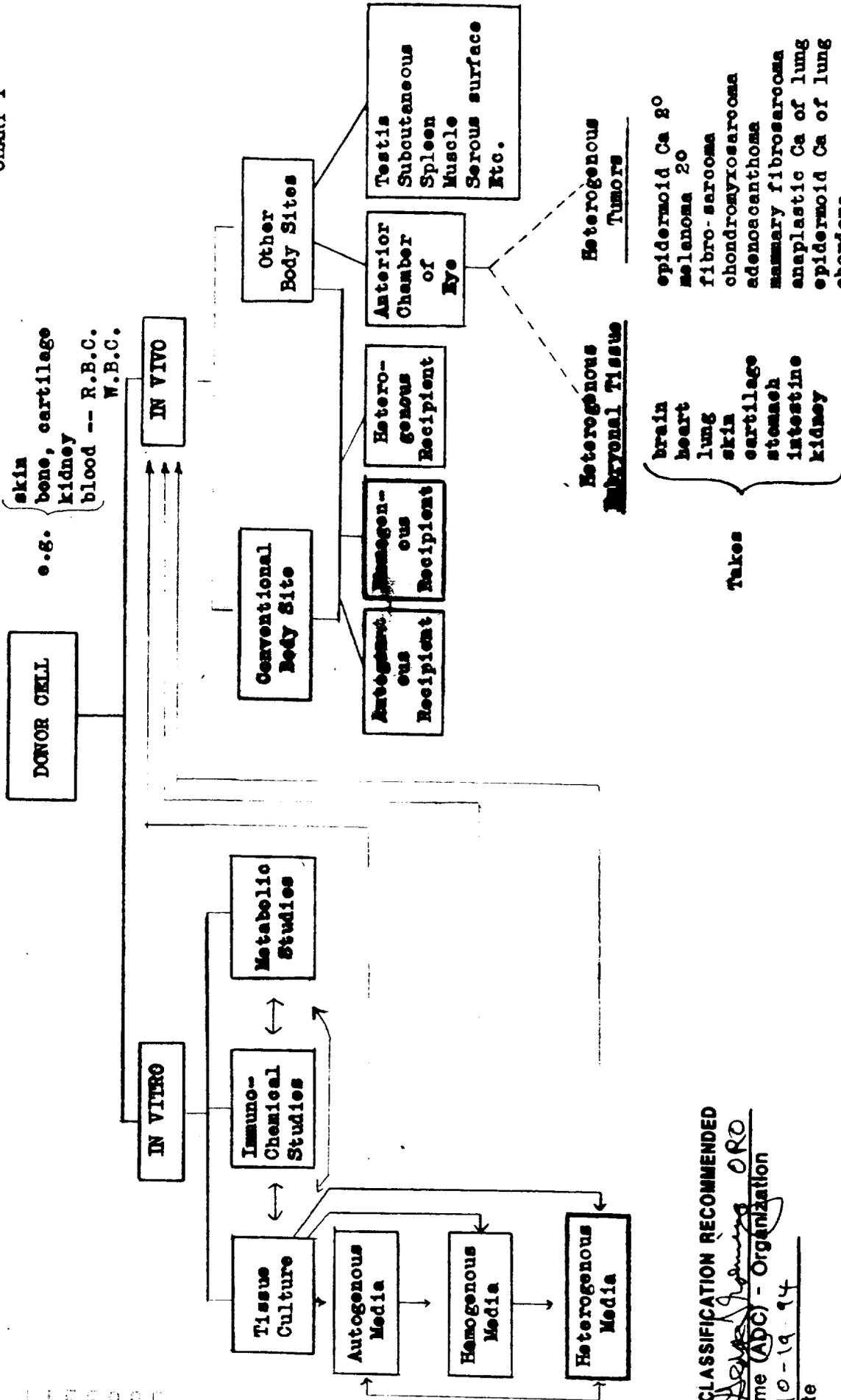
Sincerely yours,

/s/ George O. Gey, M.D.  
Division for Cellular Pathology  
Department of Surgery

NOTE: Dr. Gey wants 20,000r in one hour to be delivered to tissue cultures. He would use x-radiation, radium or any other substance that will meet this value. He does not want a chemical substance like phosphorus or iodine directly in the media. He wants to employ a physical effect only.

P.E.R.

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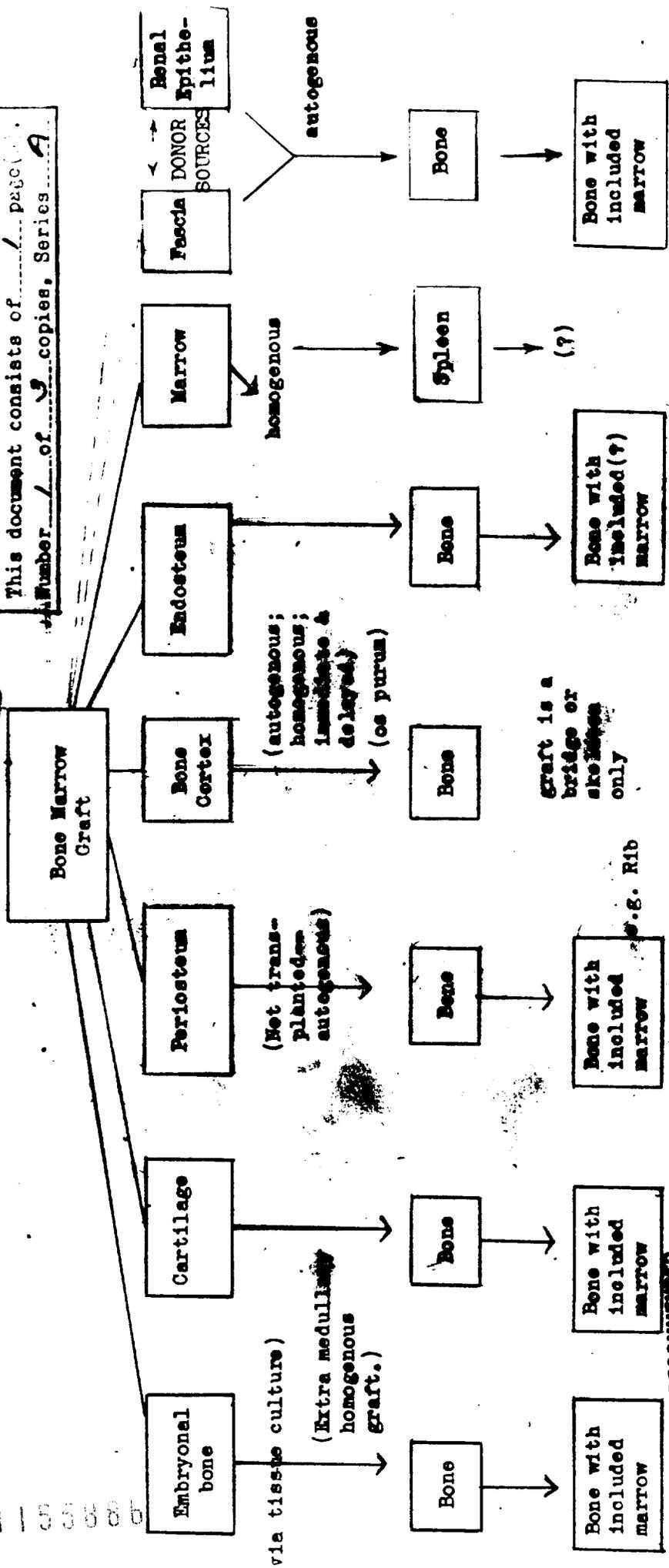
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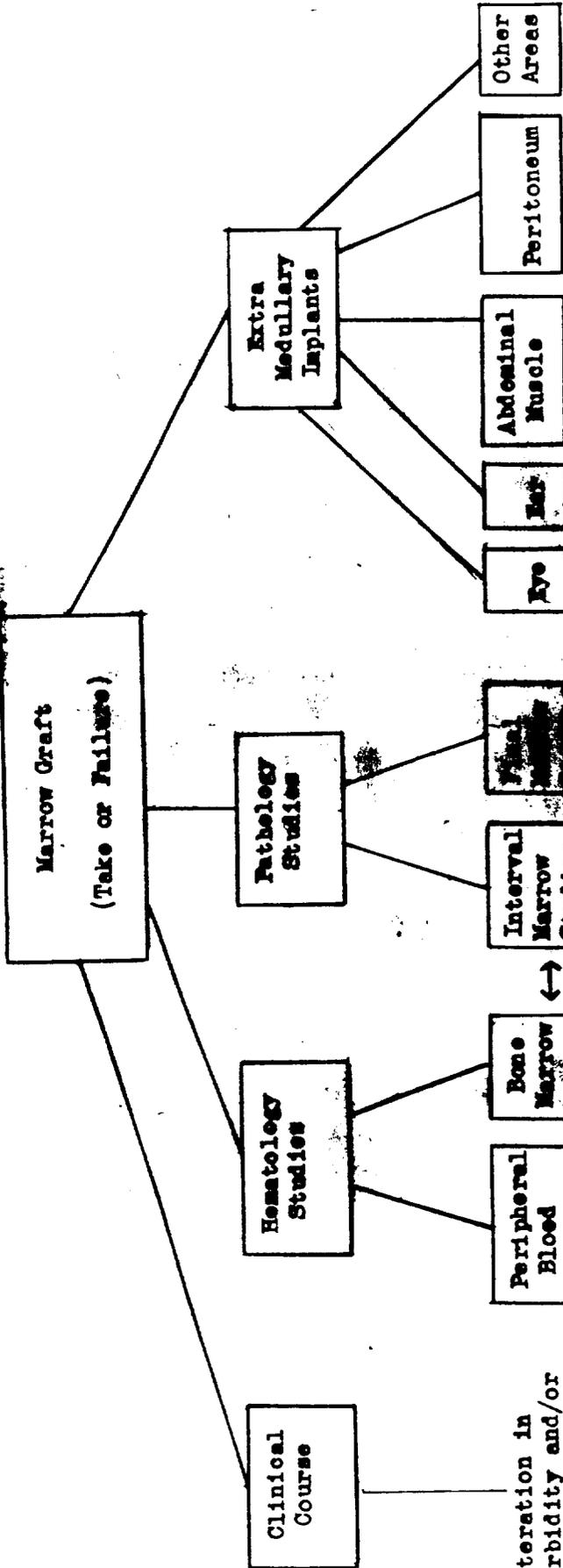
OTHER FACTORS

1. Quantity of marrow transplanted.
2. Transplant site -- a. Intramedullary b. Extra medullary
3. Type of damaged recipient -- a. acute b. chronic
4. Routes -- a. Direct b. Indirect  
c. Intravenous  
(a) Tissue culture  
(b) Refrigeration
5. Types of graft -- a. Autogenous b. Homogenous c. Heterogenous
6. Time of testing after graft.

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Alteration in morbidity and/or mortality.

Stimuli for Bone Marrow:

1. Bleeding
2. Radiation
3. Phenylhydrazine
4. Benzene

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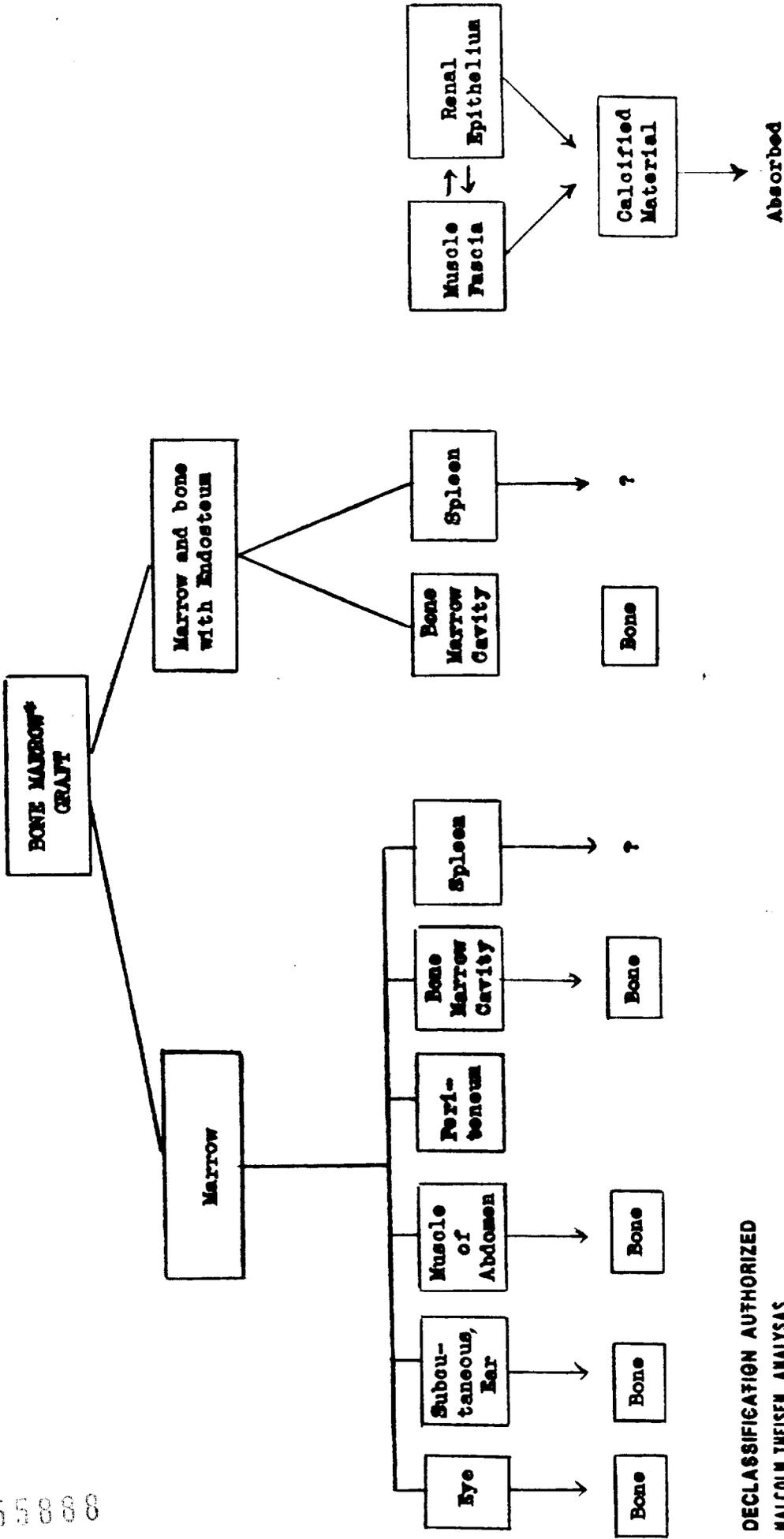
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CHART IV  
CURRENT RESULTS



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\*All Homogenous Grafts

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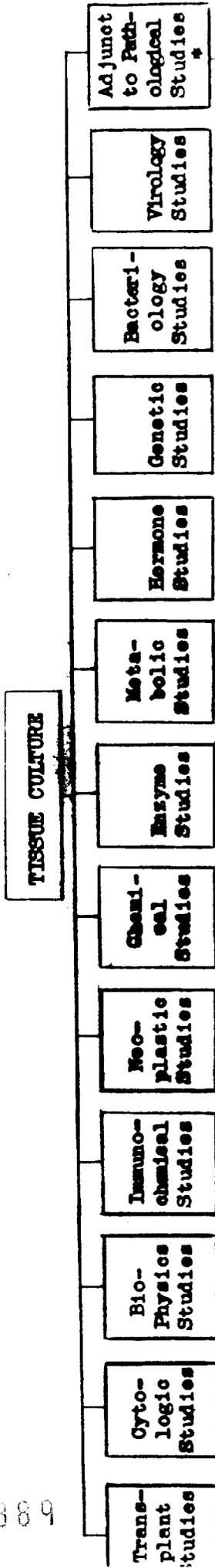
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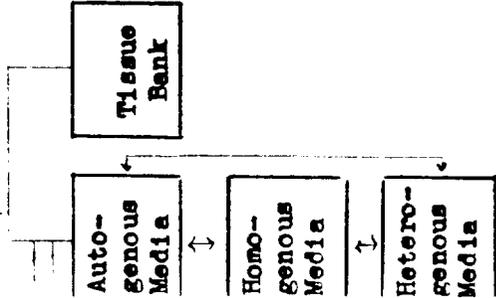
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CHART V  
APPLICATION OF  
TISSUE CULTURE



Radiation  
etc.

↘  
In Vivo  
Studies



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*John J. Schmitt ORO*  
Name (APC) - Organization

16-19-94  
Date

\* Limited to sterile specimens

DECLASSIFICATION AUTHORIZED

MALCOLM THEISEN, ANALYST

Name (ADD) -

10-19-94

Date

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TISSUE CULTURE

FACTORS FOR CONSIDERATION

1. Growth dependent upon autonomy of cells. Some may grow for limited periods of time, others for long periods of time.
2. Cells must have no photosensitivity or limited photosensitivity.
3. Current methods have many limitations. New-developments are needed.
4. Expensive for
  - 1) time
  - 2) finance
  - 3) laboratory space
  - 4) equipment
  - 5) personnel

Once the procedure is under way and methods standardized, the operating costs should be relatively low.

5. The work is highly specialized and periods of training are consequently long. Interpretations are apt to be difficult.
6. Current methods employ some variables that cannot be reduced. These are in the media for the most part. However, parallel studies can be set up employing other variables.
7. The method provides a detailed record of a cell or cells at any given time, including motion, maturation, division, transition, etc. Records can be made in the living as well as the fixed state.
8. The method permits a study of the direct effect of bio-physical agents, chemicals, gas tensions, hormones, etc.

DECLASSIFICATION RECOMMENDED

*Leslie Manning ORO*  
Name (ADC) - Organization

*10-19-94*  
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