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RECOMBINANT DNA

and the

CAMBRIDGE CITY COUNCIL

GOVERNMENT DOCUMENTS
COLLECTION

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Introduction

In the summer of 1976, a controversy arose in the City of Cambridge, Massachusetts, when the City Council became concerned that proposed research on recombinant DNA at Harvard University might be dangerous to the public.

DNA is the body's carrier of genetic information for all cells. In the context of the proposed research, recombinant DNA is the combination of DNA from two different cells to form a new strand of DNA with extra genetic information.

Some research on recombinant DNA was already underway at Harvard. To allow for expansion of that research (as well as certain kinds of virus research not involving recombinant DNA), Harvard wanted to renovate three rooms of its Biology Laboratory building. Harvard also wanted the Laboratory renovated so that it met a higher level of safety than that established by the National Institutes of Health (NIH), for either the virus or the recombinant DNA research. The laboratory could then be used for research that some critics believed was potentially more dangerous to the public than existing experiments.

This paper is intended to objectively address this controversy by fairly presenting the position of the various participants. It is a background paper and not one concerned with analyzing policy implications or making policy recommendations. The paper first provides some technical background on the nature of recombinant DNA and the proposed experiments. Following this is a section on the potential benefits and hazards of recombinant

DNA research, which also contains an explanation of the safety issues surrounding the research. The key word in the previous section is "potential" for neither the benefits nor the hazards have been demonstrated. In response to critics of the proposed research, proponents cite the safety features, both biological and physical, they incorporate into each experiment and also cite the possible benefits that may result from that research.

Concern about the potential hazards of recombinant DNA research did not originate with the Cambridge City Council. In July 1974, a small group of molecular biologists addressed a letter to the scientific community and asked that all research on certain kinds of recombinant DNA stop until the risks involved in, and safeguards necessary for, conducting the research were identified.¹ A group consisting predominantly of scientists directing research on molecular biology was invited to attend a meeting at Asilomar, California, in February 1975, where the questions of whether and how recombinant DNA research should be conducted. A resolution, representing the consensus of the meeting, was adopted calling for establishment of an NIH Committee to recommend a system of safety and containment procedures for recombinant DNA research, and suggesting that research guidelines encompassing these procedures be prepared. Guidelines, which are outlined in this paper, resulted from five meetings of a Federal Advisory Committee and one meeting of an Advisory Committee to NIH that were appointed

1. Science for the People. "The Hazards of Gene Implantation," (undated).

in response to the Asilomar recommendations. All meetings of these committees were announced in advance and were open to the public.

One of the most frequently used arguments against recombinant DNA research is the number of infections that occurred at the Federal Biological Warfare Laboratory at Fort Detrick, Maryland, where such research on known highly infectious organisms was conducted. Accordingly, a section of this paper is devoted to the Fort Detrick experience.

A controversy similar to that in Cambridge was recently resolved at the University of Michigan. Therefore, a summary of these Michigan events is presented to provide the reader with some comparative information that may be useful in evaluating the Cambridge controversy.

Harvard University's plans for constructing an enlarged recombinant DNA research facility and for the research that would be conducted in that facility are explained in Section VI. Also in that Section are some of the arguments being made for and against recombinant DNA research. It should be noted that there are Harvard scientists both in favor of and opposed to the proposed facility and the proposed research.

This paper concludes with a description of the involvement with the Cambridge City Council in the public debate about recombinant DNA research, the decision at which it finally arrived, and Harvard's own decisions concerning the proposed laboratory.

This paper is based on my reading from the references listed in the bibliography, attendance at the lengthy July 7th,

Cambridge City Council meeting, and conversations with many authorities about the recombinant DNA issue. I would like to thank them all for their cooperation. Particularly helpful have been Dr. Jonathan King, M.I.T.; Dr. Maxine Singer, N.I.H.; Francine Simiring, Friends of the Earth; Dr. Morton Madoff, Massachusetts Department of Public Health; Kostia Bergman, Science for the People; Karen Talmadge, Harvard; Debra Petic, Harvard; Dr. Walter Gilbert, Harvard; Dr. William Gartland, N.I.H.; and Dr. Mark S. Ptashne, Harvard.

I. Technical Background

Recombinant DNA (deoxyribonucleic acid) refers to DNA formed by combining a piece of DNA from one cell into a whole DNA strand of another cell. DNA is the carrier of genetic information in all living organisms except some viruses. Their genetic information is carried by RNA (ribonucleic acid).

Double strand DNA is the form found in most organisms. It consists of two chains of DNA linked at their bases in a helix array.

DNA is found in the nucleus of individual higher cells, but some simple cells have no nucleus and their DNA floats freely in the cell's fluid. Others, such as bacteria, have, in addition, small, circle-shaped pieces of DNA (plasmids) floating free in the cell's fluid (cytoplasm). In 1972, Dr. Stanley N. Cohen of Stanford University discovered a method for removing plasmids from one bacterium and transferring them to another. The plasmids can survive in the new bacterium, and they can divide and reproduce as the bacterium divides and reproduces.

Also in 1972, Dr. Herbert W. Boyer of the University of California discovered chemicals capable of cutting through DNA, without damaging it irreparably. These chemicals are enzymes known as restriction endonucleases. Such enzymes provide a means for cutting DNA molecules at a limited number of locations on the DNA strand. These locations may be deliberately varied by the choice of the restriction enzyme. The enzymes cut both strands of the DNA double helix. In certain cases, the two fragments of

DNA are each left with a "terminal impaired strand" - a so-called "sticky" end. If a cut end touches another piece of cut DNA, it "sticks" to the other cut end where the two may be "sealed" together with another enzyme yielding a complete, uncut double-stranded DNA.

The research teams of Dr. Cohen and Dr. Boyer ultimately joined forces. Using Dr. Boyer's enzymes, a specific piece of DNA can be cut from a DNA strand. It is then joined to a cut DNA strand taken from a bacterium cell using Dr. Cohen's techniques. The recombined DNA is then transplanted into another bacterium cell where it can multiply as the bacterium cell multiplies, ultimately producing a colony of bacteria carrying new genetic information.

The major controversy surrounding this technique is its use in transplanting genes across species barriers to make gene combinations that do not occur in nature. For example an experiment could be done in which DNA from a mouse cell would be transplanted to a bacteria cell.

II. Benefits and Hazards of Recombinant DNA

Theoretically, there are both benefits and hazards that may develop from recombinant DNA research.

Possible benefits include:

1. Genetic Disease Control: Development of techniques which could lead to cures for some human diseases caused by genetic deficiency.
2. Medicine: Increases in our understanding of immunology, resistance to antibiotics, cancer, and other medically important subjects. The techniques may provide an easy, inexpensive way to manufacture insulin and antibiotics. This could be done by "splicing" that piece of DNA containing the desired information and joining it to the DNA of a bacterium and allowing it to reproduce in another bacterium host. The result could be an entire colony of insulin or antibiotics-producing bacteria.
3. Agriculture: Extension of the climatic range of crops; development of plants which secure their nitrogen supply from the air rather than energy-intensive fertilizers; and development of plants which yield complete proteins and thus become a new source of food for the world.
4. Industry: Bacteria now exists that have the capability to degrade hydrocarbons, the components of an oil spill. Genetic engineering could continue to improve the digestive tract of a single bacterial strain so that one type of bacteria would clean up an entire oil spill more efficiently than is now possible.
5. Intellectual Advances: This research may lead to a rapid advance in detailed understanding of gene action, and the function and control of DNA, thus expanding fundamental scientific knowledge.

Opponents of the proposed research claim that if recombinant DNA escaped from the laboratory there are hazards that might result from:

1. A strain of the bacteria E. coli is the bacteria now being used in recombinant DNA research. Some strains of E. coli inhabit the human intestines and can be found in common places such as sewers. The experimental E. coli could possibly get into the human intestines carrying foreign genetic information perhaps infecting people with new diseases with unknown cures.
2. Genes that could make bacteria more dangerous and might be introduced into the bacteria. In the simplest case, such genetic changes might give one strain of bacteria the resistance to antibiotics that exists in other strains; thus, an antibiotic such as penicillin might suddenly become ineffective when exposed to strains of bacteria which formerly were not resistant.
3. E. coli strains might cause diseases directly through genetic means (a more dangerous case than 1, above).
4. Foreign fragments of DNA introduced into bacteria that might inadvertently carry other genes in addition to those the researcher intended to introduce which, if infectious, may start the spread of disease.
5. Safeguards involving the enfeeblement of test organisms might not be adequate if the original culture were contaminated, or because the enfeebled host bacteria might die only after transferring its DNA to another organism, in effect, recombinatory events might defeat the safeguards.

III. National Institutes of Health Recombinant DNA Research Guidelines

The National Institute of Health (NIH) is a major unit of the United States Department of Health, Education, and Welfare and is responsible for conducting research in its own facilities and funding research conducted at other organizations, such as hospitals and universities. When the DNA debate began a few years ago, the research community asked the NIH to help organize the discussion because as conductor and supporter of recombinant DNA research it had a vested interest in making sure the research was conducted under conditions that would result in its receiving continuing funding from the United States Congress. Ultimately, the NIH ended up writing the guidelines on how this research should be conducted, using recommendations from the scientific community.²

In addition to promulgating its guidelines, the NIH has undertaken an environmental impact assessment of these guidelines in accordance with the National Environmental Policy Act of 1969 (NEPA). The purpose of this assessment is to review the environmental effects, if any, of research that may be conducted under the guidelines. The assessment will provide further opportunity to consider the potential benefits and hazards of recombinant DNA research. A draft of the environmental impact statement should be completed by September 1976 and made available for

2. National Institute of Health. "Recombinant DNA Research Guidelines" Federal Register Part II, Department of Health, Education, and Welfare, July 7, 1976

comment by the scientific community, federal and state agencies, and the general public.

In designing the guidelines, several principles were adopted that are consistent with the general conclusions formulated at the International Conference on Recombinant DNA Molecules held at the Asilomar Conference Center, Pacific Grove, California, in February 1975. This was one of the first meetings to recommend development of a set of guidelines to regulate recombinant DNA research. The principles were as follows:

1. Certain experiments are potentially so hazardous that they are not to be attempted at the present time.
2. Other experiments can be undertaken at the present time if appropriate safeguards are taken and the experiment is justifiable because of the new knowledge or benefits to mankind that might accrue, and which cannot readily be obtained by use of conventional methodology.
3. A level of physical containment is to be provided to match the estimated potential hazard for each of the different classes of recombinants. For projects in a given class, this level is highest at its initiation and modified subsequently only if there is a substantiated change in the assessed risk of the methodology being used.
4. The guidelines will be subjected to periodic review (at least annually) and modified to reflect increased knowledge of the potential biohazards and available safeguards.

The guidelines recommend that all publications dealing with recombinant DNA research include a description of the physical and biological containment procedures practiced to aid and inform others who might consider repeating the work.

The guidelines further state that all people directly or indirectly involved in experiments on recombinant DNA must receive adequate instruction on the risks involved and safeguards available. This should include, at least, training in aseptic techniques and instruction in the biology of the organisms used in experiments so that the potential hazards can be understood and appreciated. Also, the guidelines recommend that any research group working with agents with a known or potential hazard should have an emergency plan which describes the procedures to be followed if an accident contaminates personnel or environment.

The guidelines specify four levels of physical containment, but emphasize that they are an aid to, and not a substitute for, good techniques. Staff must be competent in the effective use of all equipment needed to maintain the prescribed containment level. In brief, the four physical containment levels are as follows:

- P1 (minimal) Strict adherence to standard practices
- P2 (low) Limited access to laboratory during experiments, precaution against the release of aerosols and the prohibition of mouth pipetting. (Mouth pipetting is a process by which a fluid is slowly sucked into a narrow tube and then gently blown into an appropriate container.)
- P3 (moderate) Laboratories equipped to ensure inward air flow, biological safety cabinets, wearing of gloves, decontamination of recirculated air (alternative procedures suggested when air conditions cannot be controlled as specified).
- P4 (high) Special facilities and procedures of the kind used in biological warfare research. Isolation airlocks, clothing changes and showers, and decontamination of all air, liquid and solid wastes.

Three levels of biological containment were suggested when using the K-12 strain of E. coli as a host for recombinant DNA molecules. E. coli K-12 is a special laboratory strain of the bacteria E. coli. It has undergone so many mutations that it is now very different from the original E. coli. The human intestine is a natural habitat for E. coli but not for E. coli K-12. Although E. coli K-12 can survive in the human intestine, it does not colonize. In the healthy person, it will pass naturally out of the body in a few days. The three levels of biological containment are:

- EK1 Use of E. coli K-12 in its usual form.
- EK2 Use of modified E. coli K-12 host bacteria so that the survival rate of the recombined DNA is less than 1 in 100 million times less likely than EK-12 in the natural environment, e.g., if the host is spilled in the laboratory.
- EK3 Use of EK2 systems for which the increased containment (low survival rate) has been independently confirmed through animal tests.

Different types of experiments are classified in the guidelines according to the physical and biological containment levels under which they may be performed. The guidelines also contain a list of experiments that are not to be performed under any conditions.

Safety in research involving recombinant DNA molecules depends on how the guidelines are applied. To aid in their application, the guidelines recommend establishment of an administrative framework for making safety an essential and integrated function. Roles and responsibilities are prescribed for institutions and principal investigators, with the stipulation that

an institution is responsible for establishing a biohazards committee. The guidelines further contain criteria for the committee's membership and provide a description of its duties.

These guidelines are neither federal law nor federal regulation. Cutting grant funds to researchers who do not comply with the guidelines is a major weapon to assure their implementation. This is a most powerful tool, and only the experience of the next few years will tell whether it must be used.

IV. The Fort Detrick Experience

Concern has been expressed that the physical containment specifications cited in the NIH guidelines are not adequate. Opponents of recombinant DNA research have stated that: "Even in the P4 conditions of the Army's biological warfare laboratories at Fort Detrick, there were 423 cases of infection, and three deaths over some twenty-five years."³

Dr. Arnold G. Wedum, M.D., a consultant to Litton Bionetics, Inc., at the Frederick Cancer Research Center in Frederick, Maryland, was formerly the Director of Industrial Health and Safety at Fort Detrick. Because of the concern about the Fort Detrick experience, he was asked by the National Cancer Institute to return there, study what had happened, and ascertain whether the opponents of recombinant DNA research were correct in their evaluation of the Detrick experience. His report on the Detrick experience was written in 1975.⁴

Dr. Wedum concluded that "detailed analysis of the conditions under which those 423 infections were acquired does not support the statement, because P4 conditions, insofar as this requires biological safety cabinets, never were present in all the laboratories during the twenty-five years' experience."

3. Dr. Arnold G. Wedum, M.D. "The Detrick Experience as a Guide to the Probable Efficacy of P4 Microbiological Containment Facilities for Studies on Microbial Recombinatory DNA Molecules," 1975.

4. Ibid.

Wedum also considered the two major objections expressed by opponents of recombinant DNA research. The first objection is that a specific recombinant DNA can, and may, be developed that will equal or exceed the virulence and contagiousness of any presently known microorganism. The second is that this contagious DNA agent will be transmitted to the general public either by infected laboratory personnel or by microorganisms leaving the laboratory in, or on, clothing, refuse, dead animals, sewage, or air.

Wedum agrees that a hypothetical hybrid could be hazardous to all persons entering a laboratory. This is clearly evident from the many report and analyses on laboratory-acquired infections. There is no reference, however, to the development of a recombinant that exceeded the virulence of any presently known microorganisms. Also, the Fort Detrick experiments were carried on with microorganisms known to be deadly to man, not a bacteria strain like the E. coli K-12 specifically altered to have little chance of even surviving in the human body. Additionally, containment conditions were not equal to those recommended in the HHH guidelines.

Wedum states that the second objection has almost no supporting evidence. There were thirty-five accounts of laboratory microepidemics at Fort Detrick and almost all of these occurred in the absence of safety equipment and of adequate efforts to control contaminated air, sewage, refuse, and laundry. Usually no more than rubber gloves and surgical masks were used during

work on an open bench top. Nevertheless, Wedum found no reports of laboratory-attributed infections in persons who had never entered the laboratory building or who were not associated in some way with the laboratory.

It has been suggested that this is due to the fact that Fort Detrick had an excellent surveillance system and anyone in the DNA laboratory who felt ill would report it and then be immediately quarantined thus preventing spread of disease. Cambridge, it is argued, does not have such a surveillance and quarantine capability.⁵

Wedum ended his report with several conclusions and an assessment of the safety level possible when using different classes of gas tight microbiological cabinet systems.

Wedum's general conclusions were:

1. A research program consisting principally of standardized repetitive procedures is less hazardous than a program that requires comparatively frequent changes in technique and equipment.
2. The difference from P3 to P4 containment requirements will not result in a significant decrease in the number of clinical or sub-clinical laboratory-acquired infections, but it will reduce the chance of infection of unauthorized visitors, personnel in rooms close to the recombinant DNA research unit, and people in the community.
3. For research on recombinant DNA, the most effective safety measure to prevent infection of laboratory personnel is using microorganism that will not infect humans.
4. Microorganisms which can infect humans, but for which there is an effective vaccine, and also in some cases specific effect thereapy, could be considered for use in research on recombinant DNA.

5. Jonathan King, Associate Professor of Biology, M.I.T., personal correspondence with the author, October 6, 1976.

V. Recombinant Research Controversy at the University of Michigan

The University of Michigan recently faced issues similar to those debated in Cambridge concerning the construction and use of P3 laboratories for recombinant DNA research.

The Michigan Biomedical Research Council, which is composed of members from the University's health science schools, recommended that three committees (A, B, and C) be appointed to consider separate aspects in planning future work in DNA at Michigan.

Committee A (Dr. Fred Neidhardt, Chairman) was assigned three tasks: (i) Plan the modification of laboratories necessary to meet the NIH's guidelines for moderate risk containment facilities, (ii) Plan and prepare requests for external funding which would cover the cost of the modifications, and (iii) Monitor federal requirements for research facilities and inform the Vice President for Research and the Dean of the Medical School of significant changes in these rules.

Committee A started its work in May 1975, and on October 10, 1975, funds to cover the costs of renovating three laboratories were requested from the National Cancer Institute. At its November 1975 meeting, the University's Board of Regents, authorized that special university funds could be used for costs not covered by the requested grant. It was also decided that funds would not be spent on renovation of the laboratories until after the report of Committee B had been issued and discussed by the university community.

Committee B was composed of faculty members, none of whom were working in microbiology. This committee was to develop and recommend university policies or a review process for proposed research on recombinant DNA and related molecular genetics.

Committee B began working in September 1975 and completed its assignment in March 1976. Its report contains general and specific principles and practices for guiding recombinant DNA research at the university.

Committee C is to be appointed at a later time. The members of this committee are to serve as biological safety officers charged with assuring that the safety of a given laboratory is adequate for the planned research.

After reviewing Committee B's report and a critique of that report, the Regents passed the following resolution approving the Committee's recommendations:

1. Recombinant DNA Research should go forward as long as it is submitted to the controls described below:
 - a. The guidelines prepared by National Institutes of Health are an acceptable basis for insuring the safety of experimentation in molecular genetics and viral oncology. Revised NIH guidelines shall be reviewed by Committee as they appear.
 - b. Further restrictions for research at the University of Michigan are recommended as follows:
 - (i) No experiments requiring containment levels P3 shall be permitted without approval of the Board of Regents.
 - (ii) EK2 biological containment will be used when available in all bacterial experiments requiring P3 physical containment.

In addition, the Regents directed that procedures be developed for constant monitoring and safety of the research. In addition, the Regents direct that periodic appraisal of three review mechanisms be carried out by the University and reported at least annually to the Board of Regents.

At this time, the University of Michigan is making preparation to modify some existing laboratory space so that it meets P3 standards.

VI. The Harvard Laboratory

Harvard University has been conducting recombinant DNA experiments requiring P1 and P2 levels of physical containment for about twelve to eighteen months. Researchers there would like to perform experiments requiring a P3 level of containment. To allow this to occur, they wish to have some rooms at Harvard's Biological Laboratories renovated to meet the requirements of the NIH guidelines for a P3 level laboratory.

Several scientists concerned about the hazards involved in the P3 level of research were able to bring Harvard's plan to the attention of the City Council of Cambridge.

A City Council meeting was held June 23, 1976 and another on July 7, 1976. Many scientists attended and spoke for or against the construction of a P3 laboratory at Harvard.

At the June 23 meeting, scientists including Dr. Jonathan King of MIT and Dr. Ruth Hubbard, a Harvard biology professor, gave testimony in opposition to the proposed laboratory and subsequent research. Dr. King said that even at a P3 level of containment, it would be impossible to keep the bacteria from escaping because people have to enter and leave the laboratory. In response to the claim that the research has never made anyone sick, he said, "Of course no one's been affected. Nobody's ever done this type of research before." Dr. Hubbard expressed her fear that use of the E. coli, which is very common, constitutes by itself, a danger. She stated, "Everyone in this room has E. coli in their bodies right now. Thus there will be no way of monitoring what happens

until people get sick."⁶ Other scientists expressed trepidation, but several opponents admitted that their real fear is that the research will lead to eventual genetic engineering of humans and not over the biological hazards involved. Many suggested that the experiments should be done in a relatively isolated area not in a large university such as Harvard or a densely populated city like Cambridge.

Supporters of the research included Dr. Matthew S. Meselson of Harvard and Dr. Stanley Falkow of the University of Washington. Dr. Falkow said that there was no experimental evidence that E. coli K-12 could become pathogenic. He further said that many experiments had been conducted where pathogenic genes were actually put into E. coli K-12 and the bacteria still could not be made to be pathogenic. He also stated that, if swallowed, normal E. coli K-12 was capable of surviving in man if it had been well fed beforehand but that it would not multiply. Thus, all the bacteria would pass out of the normal human body within a few days. He continued that there was a very slight chance (one in a billion) that, once inside the human body, the E. coli K-12 would transfer genes to other E. coli in the body.

Dr. Meselson assured the Council of the safety of these experiments by saying that the people working in the laboratory will comply absolutely with federal regulations and the NIH guidelines. Harvard has a Safety Committee and a Research Policy

6. Harvey Lipman. "Council to Weigh Three-Month Ban of DNA Research," Cambridge Chronicle, July 1, 1976, pp. 1, 14.

Committee, both of which have approved the laboratory's construction.

If Harvard builds the P3 laboratory, it will only do experiments requiring a P3, EK1 level of containment until an EK-2 strain is approved. Harvard presently has a strain that they believe will be approved. If it is, Harvard will do no experiments requiring P3, EK2 containment. This strain has mutations that will not allow it to transfer genes naturally to another bacteria or to accept genes naturally from other bacteria. This strain cannot survive except under laboratory conditions. It has to have special nutrients not found in animals as well as water to survive.

Only people authorized to perform the recombinant DNA research would have a key to the Harvard laboratory and no one else would be allowed entry.

VII. Decisions

At its July 7th meeting, the Cambridge City Council passed the following resolutions and orders:

RESOLVED: That the Cambridge City Council establish a "good faith" three month moratorium in Cambridge on laboratory research involving recombinant DNA molecules at the P3 and P4 levels so that all concerned can properly review relevant testimony, and be it further

RESOLVED: That the Council use all available powers to see to it that the moratorium is respected.

ORDERED: That the City Manager, understanding that it is the wish of the City Council to establish a CAMBRIDGE LABORATORY EXPERIMENTATION REVIEW BOARD, immediately begin to prepare a plan for the organization of this Board which addresses the following issues and any other he deems appropriate:

- * Responsibility of the Board
- * Powers of the Board
- * Membership of the Board
- * Relationship of the Board to the internal Bio-Hazards Committees already in operation at Harvard and M.I.T.

and be it further

ORDERED: That the City Manager set to work immediately on this project and report back in four weeks so that the Council can consider his recommendation at the earliest possible date and the important work of this Review Board can begin.

Harvard University is applying for a building permit for the laboratory. It has agreed that no recombinant DNA research above the P2 level will be done until the Cambridge Laboratory Review Board has submitted its plan.

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Outline of

WORK GUIDE

for Science Resource Committee

1. Administrative

- a. See attached guidelines for consultants on "03" account who maintain their own administrative operation.
- b. Where to obtain supplies and furnishings not on the State's Supply List.

2. Bills and Legislative Documents

- a. Document Room (Room 428) all current bills; quota per person; Bulletins of Committee Work; Senate and House Journals, and mention any other documents.
- b. Public Documents (Room 116); describe information and services available.
- c. How to obtain copies of engrossed bills.

3. Booklets

- a. Types of booklets available to members of the legislature, and brief description of each; e.g. Bird Book.
- b. Where and when they can be obtained.

4. Committees

- a. Brief description of each committee, and its mandate.
- b. Procedure for recording a legislator's stand on a bill.

5. Conference Rooms

- a. State House Hearing Rooms; how to reserve one.
- b. McCormack Building conference rooms; how to reserve one.
- c. How to reserve the Gardner Auditorium.
- d. How to arrange a press conference.
- e. Getting approval to post notices of hearings.

6. Departmental Services

- a. Legislative Service Bureau: what services do they provide? Computer and reproduction services available.
- b. State House Library: how to get a library card; can one purchase a book related to work if it is not available in the Library.
- c. Treasury Department: financial services available; check cashing.
- d. Special services provided by Sergeant at Arms; Senate and House Counsel; Senate and House Clerk's Office, etc.

7. Employees

- a. Benefits available.
- b. Office behavior (answering phones, transferring calls, appearance, etc.)
- c. Are employees allowed to petition for legislation and speak on bills?
- d. Brief description of responsibilities of court officers, pages, legislative aides, and secretaries.

8. Mailing Services

- a. General distribution of mail within the legislature. Other services, e.g., getting packages wrapped for mailing in Room 116.
- b. Central Mailing services; where located. Is Central Mailing allowed to do private mailings and bill separately?
- c. What equipment is available to expedite large mailings? Is their access to folding machines, envelope sealers, collating and stuffing machines, postal scales?
- d. Postage: Who is allotted postage? How do special commissions like the Science Resource Committee get large mailings done; get postage.
- e. Federal Post Office; schedule of mail pick-ups for State House mail slots.

9. Map of the State House

- a. A map pointing out strategic places, so that people can get around.

10. Miscellaneous

- a. Arranging for State House tours.
- c. Typewriter Services.
- c. Special services; lighting, moving furniture; telephone service, etc. - Who to call.
- d. How to get extra chairs for private office conferences (e.g. call Bldg. Supt. 7-2607)

11. Photographer

- a. State House Photographer (7-2822); office and hours available.
- b. Who is authorized to use his services? How much notice is needed? How to arrange for a group photo. Is their a charge? How much are extra prints?

12. Press Releases

- a. Location of news rooms; functions each; stations represented.
- b. Where to deliver news releases; how many copies to make; suggest a format; telephone numbers of good TV contacts.

13. Printing Services

- a. Stationery for legislators and special committees.
- b. List of approved printers by the state; is the legislature exempt from the state bidding law?
- c. Xerox equipment available; work allowed and work not allowed.
- d. Other printing services.

14. Telephone Services

- a. Describe Centrex system; how to transfer calls; making long distance calls (e.g. Western Bell 122-1-413). Out of state calls
- b. How to send a telegram.
- c. Where to get telephone directories

15. Training Programs

- a. Describe training programs available to members of the legislature; who is eligible to participate?