PROJECT HIDEAWAY

A PILOT FEASIBILITY STUDY of FALLOUT SHELTERS FOR FAMILIES

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Conducted
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N O T I C E

This is a report made under an OCDM contract by Dr. Jack A. Vernon, Department of Psychology, Princeton University.

Since prompt distribution of the information is important, the report is being made available prior to final review and evaluation.

Contents of the report do not necessarily reflect OCDM policy.

The occupancy period of 14 days used in this research design was chosen to accommodate the objectives of the study, and should not be construed to indicate that people will need to remain in shelters for this length of time. The "stay-time" in shelters will vary from shelter to shelter, and may range from a few hours to several days. An uninterrupted "stay-time" of as long as 14 days is considered representative of an extreme situation which will be infrequently encountered in an actual fallout situation.

Social Sciences Division
Research

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The efforts of many people coordinated to make Project Hideaway a possibility. It would not be feasible to give proper acknowledgement at this time other than mentioning the names of those who aided us in numerous invaluable ways:

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THE RESEARCH TEAM ASSOCIATED

WITH PROJECT HIDEAWAY

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SUMMARY STATEMENTS

Project Hideaway was undertaken for two reasons: (1) to determine whether or not a family could remain confined in a family fallout shelter for a period of 14 days, and (2) to determine the nature and gravity of the problems associated with shelter life.

The first objective was clearly achieved in that the experimental family remained in the shelter for a period of 14 continuous days. The events that transpired and the way they managed their affairs will constitute the major portion of the present report.

As to the problems of shelter living, none developed with sufficient gravity to cause the demonstration to be terminated. The problems which did develop had to do with heat, ventilation, odor, humidity, and other physically produced conditions.

A family of five members served as subjects for Project Hideaway: two parents age 31 years, oldest child - a boy age 6 years, middle child - a boy age 3½ years, and youngest child - a girl age 23 months. See picture number 1 in Appendix B.

REPORT ON PROJECT

HIDEAWAY

21 December 1959

PART I

STATEMENT OF PURPOSE

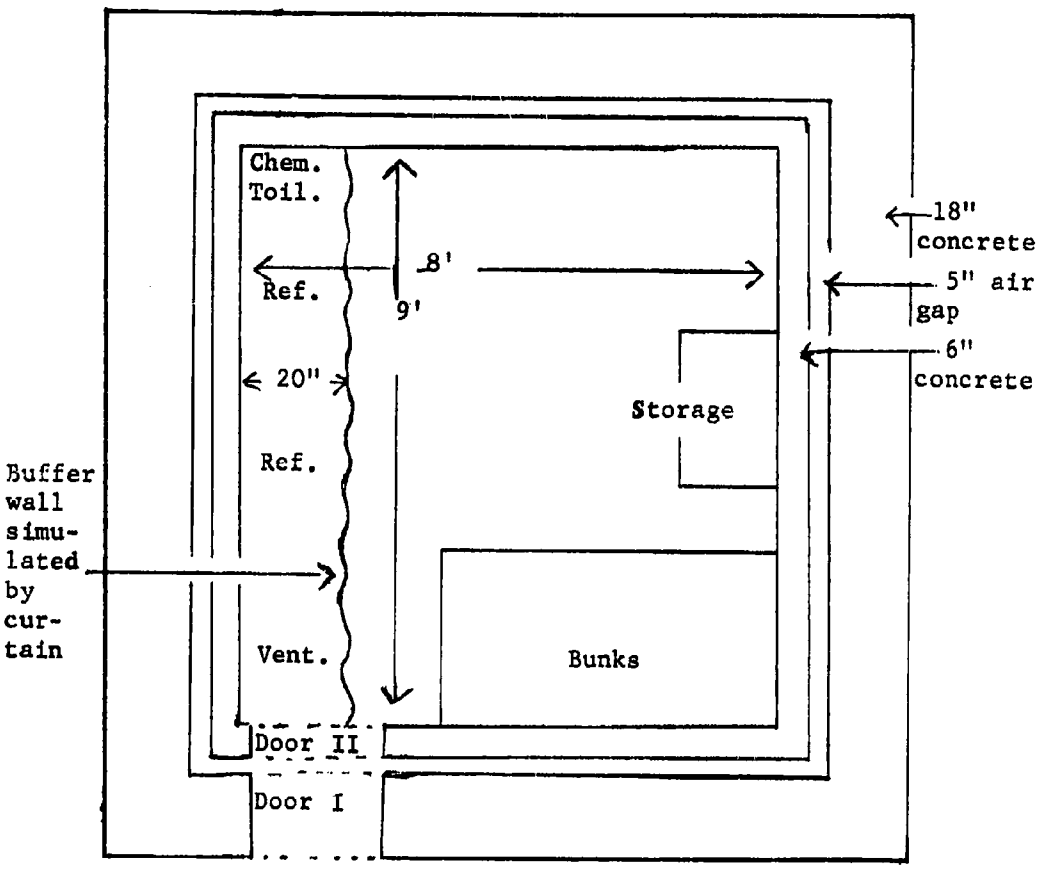
The main reason for the study entitled "Project Hideaway" was to determine whether or not a family could remain for 14 consecutive days in a simulated family fallout shelter. The description of the shelter is given in the next section.

It seems reasonable to assume that if a family can endure a simulated situation it would be capable of enduring the real, "life or death", situation. The motivation for the family to remain for the full 14 days in Project Hideaway obviously was less than in a real situation. Many of the tensions and forces likely to be present in the real situation were absent in Project Hideaway. It is our guess, however, that such tensions and forces generally would not act so as to cause one to leave shelter; to the contrary, they probably would facilitate the continuation of shelter life. To compensate for the loss of salary and usual wages the experimental family was paid a stipend of $500.00 for participation in the study.

Project Hideaway was the first case of a family entering a fallout shelter with the intent to remain confined for 14 days. Thus another purpose for the study was to identify the problems that would be associated with such an existence. Obviously, the problems are not too serious or the subjects could not have endured the 14 days. The problems which did arise may safely be classed as minor and will be discussed in the section on Findings.

DESIGN OF THE SHELTER

The shelter utilized in Project Hideaway was a simulated one. A soundproof floating room in the basement of the Psychology Department at Princeton University was modified to resemble as nearly as possible the dimensions of the family fallout shelter recommended on page 26 of the OCDM bulletin MP-15. A schematic design of the room is given below:



Door I was removed providing the alcove referred to on page 6.

Chem. Toil. = Chemical toilet

Ref. = 22 gallon refuse can

Vent. = Manually operated ventilator or blower

The main room of the shelter in Project Hideaway was 8' x 9' or 72 sq. ft., whereas the main room in the recommended shelter on page 26 of the OCDM bulletin MP-15 is 8' x 8' or 64 sq. ft. The MP-15 shelter is designed for 6 people which means 64/6 or 10.7 sq. ft. per person.* In Project Hideaway there were only five people or 72/5 = 14.4 sq. ft. per person.

The entrance in Project Hideaway was slightly smaller than that recommended. It was 20' wide, whereas that recommended in the MP-15 bulletin is 2 feet wide.

The ceiling height of the simulated shelter was 8 feet, or one and one half feet higher than the recommended shelter design. Thus the simulated shelter was slightly larger than that recommended. However, this was not a serious discrepancy since the values recommended in the MP-15 bulletin are the minimum values rather than absolute values. Obviously many individuals will wish to build larger and more elaborate home shelters according to their needs and capabilities.

There were three features of the simulated shelter which will not appear in actual shelters but which must be mentioned because of the effect they exerted on Project Hideaway. The main room in which the simulated shelter was established was originally intended for auditory research, which in turn demands the presence of electrical shielding. This shielding was achieved by lining the entire room with sheet metal. For Project Hideaway this had much the same effect as if we had sealed our people in a tin cracker box. In the diagram of the room also note that the room is surrounded on the four sides and over the ceiling by a five inch air gap. This dead air space probably formed a very effective insulation for the shelter so that heat transfer out of the shelter was impaired. The experimental shelter, although in a basement room, did not even directly contact the ground beneath its floor. Insulation from the ground was provided, again for acoustical considerations, by several alternate layers of sand and concrete saucers which finally came to rest on an 18" bed of crushed gravel before contacting the ground.

* If occupied by only five people, as was the case in Project Hideaway, there would be 64/5 or 12.8 sq. ft. per person.

These two features, the metal shielding and the insulation, undoubtedly provided an unrealistic heat and humidity transfer situation which was probably more severe than will be encountered in normal subterranean shelters.

The third feature which caused trouble in Project Hideaway and which will not be present in actual shelters was a failure to separate exhausted shelter air from the air taken into the shelter. Refer again to the diagram of the simulated shelter. Note that the doorway is recessed a considerable distance from the outside wall of the shelter. This recess, or alcove, of some 23 inches in depth was necessitated by the construction of the room. Also because of the room's rather formidable construction the air intake vent and the exhaust vent had to be located in this alcove. The intake vent was cut through the door and for the exhaust we utilized an already existing hole (3" diameter) above the door. The one thing we did not foresee was that the exhausted air proceeded to stack downward in the alcove, only to be picked up by the intake ventilator so that the air was merely recirculated. The exhausted air stacked downward because the wall above door I provided a baffle to its flow, thereby stopping the flow of air and causing it to pile up in the alcove.

This ventilation or air flow oversight caused the temperature of the shelter to climb from 70° to 89° in less than one-half of the first day of occupancy. When we finally discovered our error, it was easily corrected by arranging a pipe over the exhaust hole which led the exhaust out of the alcove in such a fashion that it could not become mixed or accepted in place of the fresh, incoming air. We also arranged for a supply of intake air which was maintained at a more constant temperature. This was achieved by leading air via ducts from an air conditioner to the area just outside the shelter at a point near door I. This will be discussed in the findings section later, but a few comments are in order here.

The air made available to the manual ventilator was dry, cool air at a temperature of 50°F. We felt that such an air temperature would be naturally available at many times during the year in New Jersey. Project Hideaway, then, must be assumed to have simulated only one of the many possible outside air temperature conditions.

The above three peculiarities of Project Hideaway; (1) the metal lining in the shelter, (2) the insulating air gap, and (3) the temperature and humidity of the outside air, must be kept in mind when attempting to generalize from the findings to other shelter conditions.

SHELTER CONDITIONS

General Conditions:

In the main, we attempted to make the living conditions of Project Hideaway fairly austere. We reasoned that shelter living should be more than mere confinement in order to affect a good test. If one had "all the comforts of home" in a shelter, there would hardly be much to adjust to and the acceptance of confinement would be very easy. It seemed best to create the more severe conditions since successful adaptation to them would insure even easier adaptation to the less austere situation. Thus the shelter in Project Hideaway had no electrical power, no radio, and no telephone or communication system with the outside.

A brief note about radio is in order because every shelter should have a battery-operated radio. In an actual emergency the exact nature of radio broadcasts is unknown, thus it was not possible to simulate them in Project Hideaway. Presumably CONELRAD will provide radiation information and general information during an emergency. Although such "broadcasts" could have been simulated in Project Hideaway, they would have had little relation to the study and may have complicated the study unnecessarily. Thus a radio was not included in the shelter.

Ventilation:

The air available to the shelter family was brought into the shelter by a manually operated ventilator, located fairly near the door of the shelter. The specifications of the blower are unknown except that it was easily operated. All of the children could manipulate it but a bicycle arrangement would have been better.

The shelter family was given no specific schedule by which to operate the ventilator. Instead, members were told to operate it as it was needed. They were informed of some of the possible indications of such need. They were told to use it if the CO_2 level increased up to 1% (see next section on Air Analysis) if the temperature climbed, if matches did not burn easily indicating a reduction of oxygen, if too much cigarette smoke accumulated, if the air became stale, and if odor became a problem.

Air Analysis:

The CO_2 and the O_2 content of the air within the shelter was determined in two ways. The shelter family was provided with the apparatus for making such determinations and instructed to do so at hourly intervals. The interval was to be changed if the findings so indicated. The air was also analyzed by the research team outside the shelter utilizing the same kind of apparatus as that inside the shelter. This was accomplished by inserting a tube through a small hole in the bottom of the shelter door and thereby collecting a sample of shelter air. Other samples of the air should have been taken through the exhaust port.

A recording thermometer was located in the shelter while the research team made readings through the two holes indicated above. The shelter air humidity was determined inside the shelter with a sling psychrometer.

The shelter atmosphere was not analyzed in any other fashion although it would probably be desirable to make a complete gas analysis of shelter air.

Illumination:

The illumination available in Project Hideaway was from two sources. In keeping with the recommendations for family shelters, given in the MP-15 bulletin, Project Hideaway utilized 4-cell 6½ volt "Hot Shot" batteries using 150-milliampere 6-8 volt flashlight-type bulbs and ordinary candles. The hot shot battery will last for ten continuous days of operation. Thus, to insure illumination for 14 days, two such batteries would be necessary. However, this arrangement would not provide more than a very slight amount of illumination. Thus for Project Hideaway four such batteries and two dozen flashlight bulbs were provided along with the necessary connecting wire and the sockets for the light bulbs. There were also two dozen candles to be used as the family saw fit. No measures of the illumination level were made although such data are needed.

Cooking:

The only facility made available for cooking was a chafing dish with candles as its source of heat. It was capable of doing little more than warming foods rather than actually cooking food.

Provisions:

A complete list of provisions is provided in Appendix A.* The food provisions were determined by the wife of the shelter family after consulting the recommendations of the MP-15 bulletin. The amount of the provisions was deliberately increased by about 50% over the expected need so that in the end it would be possible to deduct the left-over items and thus make a better estimate of the needs.

An approximate summary of the food provisions is as follows: 85 ounces of dry cereal, 150 ounces of canned cake, 120 ounces of crackers, cookies, etc., 800 ounces of canned fruit and fruit juices, 1200 ounces of canned vegetables, soup, etc., 300 ounces of canned meats and stews, 100 ounces of dry milk, 2700 ounces of soft drinks.

An ordinary card table and a folding "TV" table were provided on which to eat and prepare food.

Thirty-eight gallons of water were stored beneath the bunks in one gallon jugs. The OCDM minimum recommendations are 1/2 a gallon of water per day per person. To meet this recommendation for five people it would be necessary to stock 35 gallons of water. Three extra gallons were included merely to be on the safe side.

A first-aid kit of the usual type was included in the shelter provisions. This kit was unusual in that it contained a few special items such as tranquilizers for the children and for adults, which were prescribed beforehand by the attending physician for use only if certain specific medical emergencies did develop. It also included a suppository form of medicines for upset stomach. The suppository form was used so that the medicines could not be regurgitated. For this particular family no other special medicines were needed.

Toilet Facilities:

The shelter was equipped with a chemical toilet. The liquid capacity of this item was ten gallons. The unit was not exhausted to the outside by a special stack.

* The listing of some of the provisions in Appendix A will contain a number in brackets to the right of the item. This number indicates the amount of the item that was not consumed. If there is no number to the right of a particular item, it means all of that item was consumed. See picture Number 2 in Appendix B.

Refuse Facilities:

The shelter contained two 22 gallon refuse containers. These containers were made of a plastic material and so constructed that the lids could be tightened, thereby forming a nearly air-tight seal. The shelter was also stocked with a supply of small plastic bags. The shelter family was instructed to seal garbage and the like in the plastic bags before putting it into the refuse containers.

Emergency Alarm:

The shelter was equipped with an emergency alarm button. When the button was activated it sounded an alarm bell in the experimenter's area which was adjacent to the shelter. The shelterees were instructed to sound the alarm should they decide to terminate the confinement before the 14-day period was completed. To effect their release they were to push the button three times. Three separate signals were agreed upon so that any accidental blow to the button would not lead the experimenter to interrupt the confinement.

The emergency alarm button was located above the door of the shelter so that the children could not easily reach it and also so as to minimize accidental involvements with it.

Monitoring:

There was a team of experimenters who maintained a constant vigil over the emergency alarm. The team was composed of three men and each took an eight-hour shift.

There was a concealed microphone within the shelter which led to the monitoring station. The monitoring station was so arranged that the monitor could listen in and/or record the conversations of those in the shelter.

The monitoring was considered necessary for two reasons. First, it was important to protect the safety of the individuals in the event of illness, accident, and the like, as well as protecting them from themselves should they have acted foolishly heroic. Thus the monitoring also provided, in effect, an emergency alarm which could be activated by the experimenter.

The second reason for the monitoring was to identify and ascertain the nature of the experiences and problems associated with shelter life. Without monitoring we would have had to wait until the termination of the confinement to find out the family's experiences, problems, attitudes, and daily routine, and the family probably would have forgotten many of these details.

It was necessary not to inform family of the presence of the microphone for two reasons. In the first place, knowledge of its presence would have generated an unnatural situation and it was desirable that family members act as naturally as possible. If they had known that they were subject to constant monitoring during their waking hours, they would have been placed under undue strain.

A two-way communication system was considered but rejected since it would have provided an unrealistic situation by violating the isolation which is likely to occur during some actual shelter life.

The auditory monitoring system was used only during the waking hours. At night there was a different system. The sound level meter on the tape recorder (which was not recording) was used to determine if any sounds were arising in the shelter. Only if the meter gave persistent indications did the experimenter listen in. In this way we hoped to protect the propriety of the family situation.

Immediately, at the termination of the confinement, the shelterees were apprised of the monitoring activity. They were offered the monitors' notes and the recorded tapes to do with as they saw fit. They were also informed that there would be no reports, write-ups, publicity, etc., without first passing their censorship. (They did not choose to accept the notes and the tapes. They understood the reasons for the monitoring and in no way were disturbed by the fact that it had been done.)

Motivation:

The shelterees were paid $500 for the 14 day period of simulated shelter living. This sum represented an attempt to repay the normal wages lost to the breadwinner for the two week period plus a little extra.

There can be no doubt that the family was also motivated by the realization that their activity would render a service to their country, and in addition they would, in all likelihood, receive national publicity.

The possibility of publicity was made very clear to family members before they entered the simulated shelter and they were allowed several choices. They were offered the opportunity to prevent all publicity, to have anonymous publicity, or to have publicity which named the family and its members. They chose the latter and the story of Project Hideaway was carried in most major newspapers in the country.

Advance Publicity:

There was no advance publicity for Project Hideaway as a protective measure for the family. The project was kept secret so that fear of public censure in case of failure would not in any way intimidate the family. Even the children of the family were cautioned not to inform their friends of the proposed activity.

Legal Release:

The adult members of the family signed a waiver which relieved Princeton University, OCDM, and the Federal Government of any responsibility for anything that happened during or as a result of the confinement. The adult members of the family were as fully indoctrinated as possible on the nature of the project.

Medical Examinations:

When the family was selected the family's pediatrician was also contacted. The pediatrician became a member of the research team associated with Project Hideaway. It was considered essential that children should not be subjected to shelter conditions without the consent of their pediatrician. After consent was obtained, the children began a series of regular physical examinations several weeks prior to the confinement. These examinations were to insure that the children were sufficiently healthy to contemplate shelter confinement. Ten days prior to confinement the children were placed in relative quarantine to minimize contact with contagious diseases. Just prior to entering the shelter the children had a session with a child psychiatrist. The interview was in part to determine the advisability of placing the children in confinement. If the psychiatrist judged it appropriate to proceed, this session then provided a basis of comparison for post-confinement interviews.

The parents were given a medical examination by the staff of the University Infirmary before they were allowed to participate in the project. They also received a psychiatric interview. These examinations were necessary in order to minimize the possibility of an early termination of the project due to health considerations.

PART II

FINDINGS

First and foremost, Project Hideaway demonstrated that a particular five-member family was capable of easily withstanding 14 days of confinement in a simulated fallout shelter. More than this, the family emerged from their experience without any ill effects. In fact, they seemed to have profited by the experience. The father got to know his children better. One child got over being something of a "mother's girl", and also made great gains in vocabulary. The entire family evidenced a great deal of mutual pride in their achievement. They described their experiences in the shelter as being pleasant and useful. They felt that their family structure had been greatly strengthened as a result of the shelter experience.

The most general consideration at this point is "how did they occupy their time." Time did not appear to "drag on their hands." They were primarily occupied with the normal routine of attending to their daily needs and entertaining the children. The children did a great deal to entertain each other after they began to catch on to the spirit of shelter existence.

Ventilation:

The carbon dioxide level never became a serious problem in the shelter and the supply of oxygen was always adequate. In all probability the ventilating was the reason for the proper kind of air. Not only did manual operation of the ventilator provide fresh air to the shelter but possibly there was a thermosyphon effect due to the heat differential at the floor (the air intake) and at the ceiling (the exhaust) which helped maintain a constant source of fresh air. This seems all the more likely because there was little need for manual ventilating during the night.

The manual ventilator was operated, according to a very crude estimate, about five minutes every half hour. It has been suggested that so little operation of the ventilator could not have provided sufficient fresh air, thus all the more reason to suspect some natural ventilation from the thermosyphon effect.

The family was given no instructions on how to operate the ventilator. They used it in three different ways: (1) to cool the occupants as well as to provide fresh air; (2) as a masking noise when the chemical toilet was being used; and (3) to help control odor.

All three of the children were able to operate the manual ventilator. The parents wisely used the ventilator as a reward device. The children were allowed to operate it only when they had performed well in some way. This arrangement obviously provided a double advantage to the parents.

Heat:

The air available to the manual ventilator was maintained at 50°F. The air temperature (dry bulb) just inside the shelter at the floor level was about 70°F. while the air temperature at the ceiling was about 82°F. These values were several degrees higher according to the measurements made by the family at places farther into the shelter area. An approximate safe estimate of the average temperature of the room would be 78 or 79°F.

A more exact statement of the temperature depends upon several other conditions. For example, if the family was exercising, which it did on a regular basis, the temperature would climb rapidly. Ten minutes of exercise by all five members increased the temperature by as much as 7°F.

At nighttime, the shelter temperature reduced and tended to stabilize, at the ceiling, at about 78°F. despite almost no operation of the manual ventilator. Apparently the difference between day and night air temperatures was due to the difference in the total heat output of resting and sleeping people. The total heat output for a person sleeping is about 275 BTU/hour whereas it is about 400 BTU/hour for a man seated at rest. There is also a slight drop, 0.2 to 0.4°F., in the skin's temperature when one sleeps.

Humidity:

High humidity did not become a problem in Project Hideaway but probably only because the air available to the ventilator was cooled and dried by the air conditioner which supplied it. The measurement inside the shelter with the sling psychrometer indicated that the humidity was about 74% which was probably an increase over the supplied air.

Humidity should increase in the shelter because of the moisture added to the air through skin evaporation and expired air from the occupants. The amount of moisture added will depend upon the temperature. For a temperature of 80°F. of a man seated at rest will add about four pounds of water to the air per day.

The Project Hideaway family noted that things required a long time to dry. For example, a bed sheet which was wetted by the middle child required several days to dry. The sheet was hung to dry and because it dried so slowly it soon became the focus of artistic activity. As can be seen in picture number 3 of Appendix B, a rather nice mural was produced by the mother using children's crayons. They all pretended that the mural was the view from their kitchen window at home. Each of the occupants took a great interest in the development of the mural during the four or five days it was being done, and each participated by offering suggestions and ideas on its composition.

Odor:

The accumulation of human excrement,garbage, refuse, and the like provided sources of undesirable odor within the shelter.

The presence of odor did not become a serious problem due to the fortunate capacity of human olfactory sense organs to adapt. The Project Hideaway family seldom detected unpleasant odors despite their rather intense presence. The experimenters always noted the odor of the exhausted air each time they came in to start their particular shift.

Contrary to the instructions given before confinement concerning garbage and the plastic bags, all refuse, waste water, and fluids drained off the chemical toilet, were dumped into the refuse containers. After several days, chemical action began to take place and gas formed. This gas began to bubble up through the fluids which provided an undesirable and somewhat nerve-racking source of sound. The gas formed in this manner may have been "swamp gas" or methane.

Illumination:

The illumination facilities proved adequate for most tasks. The adults were able to read, attend to daily activities, play with the children, and the like. A flashlight was also provided to take care of changing bulbs in the event of failure and to seek out food supplies.

Most of the daily routine was conducted with three of the Hot Shot batteries, the 150 milliamp, six-to-eight volt flashlight bulbs, and two candles (See picture number 4 Appendix B.) The reflectors which were produced by the occupants from baking pans can be seen in the picture just to the right of the handle of the frying pan. The same sort of reflector was used with the candles.

The only difficulty experienced with the illumination facilities was the unexpectedly short life of the flashlight bulbs. They burned out after several days of use when they should have lasted ten days. After a bulb first "burned out," however, several more hours could be gained by thumping on it. Thumping the bulb with the finger apparently jiggled the filament back together so that it continued operation for a while.

The general illumination of the shelter was increased by making the ceiling white. The simulated shelter used in Project Hideaway had walls and ceiling constructed of beaver board which has a dull brown color. The occupants made the ceiling white by tacking up a sheet.

Since illumination may come to depend upon candles it is necessary to have a supply of matches and/or cigarette lighters. Since it is possible that shelters can become very humid, matches may be rendered useless by the moisture. Thus the shelter stockpile of matches should be kept in airtight jars or the matches should be "moisture proof."

Cooking:

With the facilities provided, cooking was at a minimum. The preparation of a meal was a long process, occupying a great deal of the total confinement time. It was estimated that a meal required about an hour or so to prepare.

The major part of this time was spent in heating or warming the food. The frying pan in which the food was heated was improved by dividing it. That is, three compartments were provided by aluminum foil partitions so that three different items could be heated simultaneously.

Cooking time was greatly reduced by an improvement of the heating candle. The occupants discovered that if the candle had four wicks rather than one a great deal more heat was generated. With this procedure they were able to boil water which made possible their first cup of really hot coffee. Unfortunately, the improved candle was not "invented" until about the eleventh day of confinement.

Washing and cleaning the utensils was kept at a minimum with the use of paper plates and cups. The tableware and the like were washed in water heated in the manner described above.

Provisions:

The food and water stockpiled for Project Hideaway were at least adequate. (Refer again to Appendix A where it will be noted that the shelter occupants consumed practically everything provided.) It is a bit surprising that so much food was consumed in light of the deliberate over stocking. There can be no doubt that the family could have gotten along on a great deal less.

Two food items worthy of mention are bread and milk. The shelterees agreed that their desire for bread was very strong and that something like canned bread would have been most welcome. They had canned cakes, brown bread, and date-nut bread but they felt that these were a poor substitute for ordinary white bread. The powdered milk seemed to have worked very well for adults and children alike in Project Hideaway. The children were especially fond of it when it was made into chocolate milk by adding chocolate syrup. If syrup should become a storage problem due to lack of refrigeration, powdered chocolate would serve the same purpose. Not all people agree on the palatability of powdered milk, but because of its ease of storage all families probably should stockpile it.

The supply of water was carefully rationed at the start of Project Hideaway. After about the first three days the occupants could easily foresee that their supply was more than adequate for the full fourteen days. Thus rationing ceased and they used water as it was needed. At the end they had ten gallons remaining.

The water was stored in one-gallon bottles placed beneath the bunk. These small separate containers offered several advantages. They were light enough to be easily moved about without fear of their being dropped. Also, when a bottle was emptied it served as a container for waste water and fluids which could be sealed. If only a few large bottles had contained the water supply, they would have been very heavy to lift and an accident could have eliminated the entire water stock. On the other hand, using large bottles has the obvious advantage of not taking up as much floor space.

Tools, Tables, Toys, Games, etc.:

The occupants of the shelter took with them a supply of tools they considered they needed, as well as those which would be easily available in their home. These included a hammer, a screw driver, a pair of pliers, some string, a few

nails, and the like. Obviously some such supply of simple tools was necessary in order to repair any equipment failures that might have occurred. For example, it is imperative that such things as the ventilator be maintained in good working order.

The tables provided in Project Hideaway were found to be inadequate and troublesome. They were folding tables which afforded an obvious space advantage but they were very unstable. At mealtime there were frequent minor irritations from the children bumping the table and spilling things.

The children took a supply of toys into the shelter. These were selected on the premise that they were the type of toys which would have been naturally available in their home. It was not possible, nor would it have been realistic, to stockpile a great variety of toys so that the children would have been less likely to become bored. The novelty value of the toys was nevertheless maintained at a high level. This was done by more or less bringing out toys one-at-a-time. In a given play period each child was allowed one specific toy. When play was over or when interest fell off, that toy was taken up and put away only to be brought out again several days later.

Each child's special and/or favorite toy was included as well as his "security items", such as blankets or stuffed toys. In Project Hideaway the experimenters were very apprehensive because one such item was inadvertently left out. One little boy's stuffed lamb was overlooked in the excitement of taking shelter. Fortunately no problems arose from this oversight because he had several other security items. When he came out of shelter we noted that he no longer had any interest in his lamb.

The one item which had the highest and most persistent interest value for the children was modeling clay. The advantage of such material is obviously the infinite number of different things which can be made with it. The clay was better than a model automobile kit in that once the production was over it was possible to lump the clay and start something else. The act of the production seemed to be the more important part of the diversion.

The act of production did not have interest value for children alone. The adults found any creative activity to be most diverting and absorbing. They also found reading to be a major occupation especially when the children napped or otherwise did not require attention. They took eleven books into

the shelter, read all of them, and reported they could have easily used more. The children also had some books.

We should have included some song books so they could have done more singing. The occupants of Project Hideaway spent a great deal of time in group singing but they were limited because, naturally enough, they could not remember the lyrics.

There were games for both children and adults, however, these did not occupy much time. Clearly this is a matter of personal taste but for those in Project Hideaway games, although used some, were not the major source of entertainment. In part the cramped quarters were responsible, especially for the adults, who did not want to make noises in playing games that would awaken the children.

Toilet Facilities:

The toilet facilities of Project Hideaway were adequate and no more. The so-called "chemical toilet" did not decompose, destroy, or in any way get rid of the waste materials. It only served as a repository for them and thus created problems of odor.

The arrangement for privacy in the toilet area was adequate even though the partition was merely a cloth drape. To those in Project Hideaway it was important that normal propriety be observed.

The other normal toilet facilities such as cosmetics, shaving, and bathing were provided. They were not used to any great extent, however. The only cosmetic used by the adult female was lipstick which she felt had some morale value for her. It is her normal daily practice to wear lipstick.

The male adult shaved only three times during the two weeks. The lack of hot water made shaving unpleasant and so he shaved only when the itching of the beard became more uncomfortable than shaving it off. The three times he did shave he had more than usual bad luck in cutting his face.

The facility for bathing was naturally greatly limited. The children stood in the plastic dishpan and had water poured over them about every three or four days. The water was reused until it became questionable whether or not any additional use would have cleaning value.

The adults were denied such a bath but had to resort to "sponge baths". They reported that these were totally inadequate and that they felt a need for adequate bathing. Our cultural

habits about bathing are rather demanding and it would appear that while our attitudes about bathing and personal cleanliness can change, more than two weeks in a shelter is necessary to effect such a change.

Refuse Facilities:

The two 22-gallon refuse containers were not sufficient to hold all the refuse that collected over the two-week period of confinement. Space here was conserved in every way imaginable. Tin cans, before going into the refuse containers, had both ends removed and were flattened. Papers and cardboard cartons were folded flat. But there was still enough refuse to easily fill one more 22-gallon container.

Activity Schedules:

Each adult wore a wrist watch and there was a travel alarm clock as well in the shelter. The more-or-less routine daily schedule was maintained by clock time. That is, nap periods, meals, bed time, and the like were determined by the clock. The clock time also allowed them to keep a record of the elapsed time of confinement.

The accounting of elapsed time was judged to be the more important use of clock time. However, they felt that clocks were not of prime importance. If all clocks had, by some freak accident, stopped during the night they claimed that they would merely have guessed at the time, set the clocks, and continued to use them. If the clocks had failed then they claimed they would have tried to reckon elapsed time in other ways; growth of beard, hunger pangs, toilet needs, etc. All of which is to say that they were concerned with the elapse of time.

The fact that all three time pieces were slightly out of phase caused no problems or concern. In fact it provided a source of mild amusement and was the origin of a small wager made between the two adults.

The only problem which arose involving time was when one adult overestimated the elapsed time by one day. It was a minor confusion but knowledge of the mistake was disquieting.

Before taking shelter the adults had worked out some schedules of activity which they proposed to use in the shelter. For example, they had a special kind of play period which they were going to effect in the mornings that was to be group play. In the afternoon there was to be group exercises and group activity followed by individual and quiet activity. As it turned out, however, these plans were abandoned in favor of emergent activity.

Attitudes:

The Project Hideaway family emerged from two weeks of shelter living with a very positive attitude toward shelter life. They felt it had not been difficult, that it had been worthwhile, and that there had been no ill effects.

The most positive effect of the confinement was the integration of the family. The father of the family had an opportunity to get to know his children better and, as a consequence of the conditions, he came to have a new-found respect for the entire family. Both adults felt that the children actually profited by the experience. The youngest child's vocabulary increased a great deal more than it would have under normal conditions which was probably due to the attention she received. This attention came from the other two children as well as from the parents. The older children came to take on the responsibility of the younger which helped her achieve needed independence from the mother.

The attitude of the adults toward the family was tested by projective techniques before and immediately after shelter. The somewhat involved testing technique will not be explained here but the clear conclusion of the tests was that shelter life had produced a positive attitude toward the family.

The attitude of the family toward shelter life was also a positive one. For example, they were requested by the press to return to the shelter for picture taking the day after their release. They had no difficulty in so doing. The children even returned to their shelter play activity just as though they had not completed the confinement.

Health:

The medical examinations of the shelterees revealed no ill effects from shelter life.

The middle child had some minor setbacks during the confinement. He seemed to withdraw a bit, to become quiet, and uninterested in any activities. He was quickly brought out of this attitude by one administration of a tranquilizer. He had been toilet trained before going into the shelter but he regressed a bit during the experiment. This regression was minor and short lived. The follow-ups after release from confinement show him to be perfectly all right.

All members of the family, save the child mentioned above, lost weight during the confinement period. The amount of weight loss was not serious, a couple of pounds for each, and it was quickly gained back upon release from confinement. Apparently

the middle child who regressed a bit during confinement failed to lose weight because of compensatory eating. There are some medical people who claim that much of overeating is due to an anxiety problem and perhaps such was the case here. In any event the adults reported that never before or since had the child eaten so much as he did during confinement.

The adults suffered some severe dizzy spells while in the shelter. Some of these were severe enough to be incapacitating. On these occasions the other adult had to carry on all of the shelter functions and fortunately the two adults were never so afflicted at the same time.

The cause of these attacks is unknown but probably many things combined to produce them. For example, there was the swamp gas generated in the refuse cans, eye strain produced by a great deal of reading in inadequate illumination, heat of the room, and the general tension associated with so novel an experience.

The effects of the relative inactivity of shelter life remain unknown. The Project Hideaway family engaged in regular exercise periods which consisted of calisthenics and "marches". Even so, upon release the male adult found that a return to normal work activity generated a great deal of pain in the knee joints. Perhaps such a condition is peculiar to this one man; only additional research will clarify this matter.

Both adults noticed rather severe backaches very early in the confinement. The backache, as it turned out, was produced because they walked about within the shelter in a slightly stooped manner. When they realized this and straightened up the backaches disappeared.

No salt tablets were provided in Project Hideaway, but if continued high temperatures and humidity had obtained, the need of salt may have increased.

PART III

RECOMMENDATIONS

One isolated shelter study cannot generate laws dictating to all subsequent shelter experiences. Project Hideaway, because it was only one study and because of its conditions, can only provide very general recommendations about shelter life. As with most studies, Project Hideaway has emphasized the need for additional studies and continued research. Probably the most important single result arising from Project Hideaway is the fact that family fallout shelters can be recommended. It has been demonstrated that, at the least, a family can maintain a 14 day confinement without ill effects.

The specific recommendations which follow are intended not as an exhaustive list of shelter needs but rather as an addition to the recommendations already made by OCDM.

Illumination:

It would be difficult to over-stress the importance of illumination for shelter life. The absence of illumination in the shelter would be as drastic and as devastating as sudden blindness. It is our belief that adequate illumination is more important than adequate food provisions.

If the family owns hurricane lamps, kerosene lanterns, or Coleman lanterns they most assuredly should be stored in the shelter. Their use may be determined in part by the heat of the shelter. Weather conditions can be imagined where added heat may be welcomed.

At the very least, shelters should be stocked with a sufficient supply of candles to provide for the normal daylight hours. If critical shortages develop, the wax of the candles should be collected in order to make more candles, using string for wicks.

The quantity of illumination can be increased by using reflectors. Reflectors can be made easily from aluminum foil - another reason for stockpiling aluminum foil.

The use of the battery-operated lamps as suggested by OCDM is highly recommended. They provided an excellent source of light, especially when several were used at the same time. The purchase of them, however, may provide a limitation since the batteries are not inexpensive. Operating one unit only provides a very dim "night light" which does not permit reading or any "fine" work. Four or five batteries should be stockpiled if they are to power the major source of light for 14 days.

The use of burning lamps may involve several hazards. Fire, fumes, and depletion of O_2 may possibly result from these instruments; thus the shelterees should be warned to guard against such happenings.

Cooking equipment:

The problem of cooking in the family fallout shelter is closely related to the problem of shelter temperature. Although there is a good chance that the shelter temperature will rise as the result of the humans in it, one must not conclude that this is the only possibility. Clearly, confinement during the very cold parts of the season or in very cold sections of the country may find the shelter far from overheated. Thus it seems reasonable to recommend that the shelter cooking facilities not be limited by heat considerations. It is recommended that the shelter be stocked with any sort of camp cooking stove (i.e., Coleman, sterno cookers, and the like). These items will then be used according to the conditions of the shelter and the wishes of the family.

Good food can have such a positive morale effect and poor food can be so unpleasant that it seems reasonable to recommend efforts in the direction of preparation of desirable food.

If the cooking facility has the capacity to boil water there will be improved sanitation, for it would be possible to clean properly cooking and eating utensils.

The chafing dish and candle arrangement which served to warm food in Project Hideaway is about the minimum cooking equipment one can imagine. It did work, however, and especially after the additional wicks were put in the candle. Thus this arrangement is recommended as a stockpile item regardless of what other arrangements are made. It would serve as the cooking facility in case of high shelter temperature and it would always serve as a stand-by facility.

A large supply of paper towels is recommended. They served a great variety of uses in Project Hideaway including table cloths, towels, napkins, dish towels, drawing paper, and cutouts.

It is also recommended that the shelter have a sturdy, stable table which can fold out from the wall. The table is needed for all manner of things besides a place to prepare and eat food but should nevertheless be collapsible making more space available. Folding chairs, of the bridge type, may also be useful as a means of making more shelter space.

Storage of food provisions presents two problems. If the provisions are placed in cartons on the floor, valuable floor space will be used. Therefore, it is desirable to arrange ceiling shelves so that provisions can be stored above head level. If provisions are stored on ceiling shelves they will be out of reach of the children. This, oddly enough, can constitute a serious problem. The adults of Project Hideaway often had the mild worry that the children would get into the provisions, eat things they should not eat, waste items, and perhaps even remove labels from cans.

Recreation:

Recreation is clearly so much a matter of personal taste that it is difficult to make recommendations. Several items clearly stood out, however, in Project Hideaway and are thus recommended for shelter life.

Music was so important that the Project Hideaway family spent a lot of time singing any song they could even partially remember. They had no musical instruments and so they improvised drums out of cracker cans. The "paper-comb" would have added a great deal and is recommended in the absence of other musical instruments. It is strongly recommended that the shelter be stocked with song books, song sheets, musical instruments and the like. The morale value to be derived from music is very strong.

Other recreation facilities would do well to emphasize the creative and productive aspect. For example, modeling clay with which anyone can sculpt would afford many hours of good entertainment, as would painting and drawing.

Adult games, cards, etc., could be enjoyed. The adults should not hold back for fear of awakening children. Children will quickly adjust to the environment of shelter life.

A large number of books should be included in the shelter. If confinement is to last 14 days there should be at least that many books. The escape value of books is well known, and probably nowhere would this quality be more welcome than in a shelter.

Shelter Design:

The design of a shelter will be partly governed by the amount of money one is willing to spend. In this regard, it is strongly recommended that the family fallout shelter be one which has a dual purpose. For example, it may normally serve as a game room, a den, a workshop, a music room, or any other variety of purposes. There are two important considerations for a dual purpose shelter: (1) it must be possible to stockpile provisions in the shelter without detracting from its other use and (2) the daily use of it must not be such as to compromise its use as a shelter.

The cramped quarters of the shelter recommended in the publication by OCDM, MP-15, has been proven adequate; however, a larger room or more space would be more desirable. It is recommended that the internal room of the shelter be 10' x 10' x 8'. This size would provide greater flexibility of arrangement of beds, tables, etc. and the height would allow for the ceiling shelves mentioned earlier. Obviously if one is to build a shelter in an already existing structure, such as a basement, the specification recommended may not be possible. For example, the 8-foot ceiling would not be possible in most basements. In these cases, the other dimensions should be increased to make the shelter as large as possible. Not only will there be more space, but the problems of ventilation and heating will be reduced.

The ceiling of the shelter should be painted white to improve illumination. It may also be desirable to paint the walls white, not only to improve illumination but to create the illusion of greater space. Inasmuch as these shelters may be in basements or below ground level the paint used on the inside walls should be a fungus and mold-resistant paint.

If the floor of the shelter is cement, it should be sealed to prevent flaking and dust. The floor may be cold and so, perhaps, should be covered with a rug. If a rug is not on the shelter floor as a natural consequence of the dual use of the shelter, one should not be purchased just for the shelter. Any rug from any room in the home could be taken into the shelter as a "last-minute-thing".

If the family shelter is not a dual purpose room but is built exclusively for shelter use its entrance should have a lock. It would be desirable to lock the shelter when not in use to prevent abuse to the stocked provisions and general misuse of the area. It would also be desirable to be able to lock the shelter from the inside which might serve as some protection against invaders. Keys for these locks should be hidden on both inside and outside the shelter to prevent accidental "lock-outs".

Water storage should be considered in shelter design. The recommendation made earlier in the report of using many one or two gallon bottles is permissible only when one has time to fill such bottles just in advance of taking shelter. In the actual emergency such a process may not be possible. It is highly desirable to have this problem solved in advance of taking shelter. If the home's hot water tank is located within the shelter, a supply of water would be available. One would have only to shut off the incoming water, extinguish the heating unit, and allow the water to cool. It has been suggested that an extra tank (40 gallons) be installed on the water line which would be filled before the water goes into the house's usual uses. This tank would be located in the shelter and would be constantly filled with fresh water. It would have shutoff valves on both sides and a faucet for shelter use. Upon taking shelter, the shelterees would have only to shut off the incoming water supply so that contaminated water would not enter the water tank. Since water already in the house would not be likely to be contaminated, drain-back from the regular water tank would not present a hazard. The pre-heater tank arrangement is a regular part of the hot water systems of some hotels and restaurants and its usefulness for shelter purposes is readily apparent.

OCDM recommends a two-weeks' supply of water be stored in shelters. When stored for long periods of time drinking water may develop undesirable tastes or odors. Since water throughout the country varies in quality, the periods of time in which these distasteful properties may develop also varies. The family should maintain this recommended supply of water in the shelter. However, if warning time permits it would be desirable to replace it with a fresh supply of water, prior to taking shelter.

If there is any chance that the shelter will not be stocked with water, special care must be taken to stock any form of liquids which can be consumed. There are many canned and bottled liquids and juices which would at least help with the problem of thirst.

The home shelter should be equipped with electrical outlets. There is no guarantee that electrical power will be available in the actual emergency, but if it is available the shelter occupant should be prepared to take advantage of it. Obviously, shelter occupants must not depend upon such a contingency.

There should be several wall outlets located on opposite sides of the shelter. A single, overhead light bulb arrangement is not sufficient. The last-minute affairs of taking shelter should include gathering up those electrically operated items which the family would find useful. Such items might be: radio, fan, lamps, hot plate, and electric utensils such as frying pans and dutch ovens.

Refuse Disposal:

The problem of refuse accumulation and the resulting odors is not to be taken lightly merely because the sense of smell adapts to the odor. Just the knowledge that the waste and refuse are accumulating in the shelter is unpleasant.

It is recommended that, whenever possible, the refuse or garbage be sealed in small containers such as plastic bags. These containers should be thrown out of the shelter the second day or so. The radiation would have dropped to such a level that it would be completely safe to leave the shelter long enough to cast out refuse bags.

A refuse container with an "air-lock" type lid should be available in which to store the refuse bags until they can be removed from the shelter.

A similar arrangement could be made for the toilet facility. Since the usual commercial chemical toilet is only a repository for waste, it is necessary to remove the waste accumulation from the shelter. This could be done easily by having an arrangement of disposal containers (probably heavy wax paper) inside the toilet. Periodically these would be removed from the toilet container, sealed, and removed from the shelter.

It is recommended that there be a small pan of disinfectant near the toilet. A mild solution of something like Lysol would probably be satisfactory. This solution would permit hand washing and would most likely enhance sanitation. Such a procedure was used by a couple who remained in a family fallout shelter for one week. They report that it, at least, had the effect of making them feel hygienic even when they felt unclean.

Taking Shelter:

The art of taking shelter was not investigated in Project Hideaway; consequently the "recommendations" here are merely guesses.

It seems reasonable to suggest that the shelter should be as completely stocked as possible at all times. It should be ready at a moment's notice. It should be this way so that the time available for taking shelter can be devoted to other things. There may be the problem of collecting the children from the neighborhood, or merely getting back to the home and the shelter. It is not possible for the family to live its daily life within easy access to the shelter. A family must be prepared to use all the warning time in just getting to the shelter.

If more time is available it should be used in taking items, including "luxury" items, into the shelter. Collecting mattresses, blankets, extra clothes, pantry food supplies, the rug and electrical equipment mentioned earlier, etc., would be profitable activities during the alert or warning period.

It is recommended that all food, water, and such provisions should be stockpiled in the shelter well in advance of the shelter taking.

Since many families will wonder what instructions should be given to children about shelters it is worth a recommendation here. The recommendation is to give no special instructions to children. Very young children will probably need no explanation since the presence of the parents will most likely be sufficient. Older children are obviously capable of understanding the need for shelter life.

Parents should not view shelter life with children apprehensively. The presence of the children may provide the basis for sustaining the parents during the confinement. The

children present an opportunity for the parents to engage in very productive activity. Not only will the parents spend some time entertaining the children, but they may profitably engage in actually instructing in such subjects as mathematics, reading, spelling, or whatever is appropriate.

When the family has its shelter completed, there should be some shelter-taking exercises conducted much for the same reason that schools have fire drills. Also, if the family spends some time in the shelter together, say a day and a night, positive associations with the shelter can be generated. To spend an occasional week-end in the shelter could hold much of the excitement of camping out and at the same time serve to show the family exactly what their needs will be. Once a given family becomes acquainted with their shelter they may be able to give helpful instructions to neighbors and others about shelter life.

Respectfully submitted,

Jack A. Vernon

APPENDIX A

APPENDIX A

FOOD

7	10 oz. boxes Kellogg's variety cereal (2)
1	12 oz. jar Kretchmer wheat germ (1/2)
2	cans Crosse and Blackwell date nut roll (1)
4	11 oz. cans B and M brown bread (2)
6	12 oz. VBC pound cake
2	bread loaves
1	1 lb. box Nabisco graham crackers
1	9 oz. box Burry's butter cookies
1	1 lb. box Burry's fudge filled shortbread
2	12 oz. tins Virginia Lee pretzel sticks
3	8 oz. pumpernickle Sokeland's (2 1/2)
1	14 oz. box Butter Finger Chips
1	14 oz. Burry's assortment
2	10 oz. Burry's assortment
2	1 lb. box Delicia sugar wafers
4	1 lb. jar Sunsweet cooked prunes (3)
6	1 lb. (303 can) A & P applesauce (2)
7	1 lb. 1 oz. (303 can) A & P sliced peaches
5	1 lb. (303 can) A & P grapefruit sections
4	#2 can A & P orange juice
2	#211 can B C orange and apricot juice
2	#2 can Heart's Delight apricot juice
2	#2 can DelMonte pineapple juice
2	#2 can Dole pineapple spears
5	8 3/4 oz. (buffet size can) A & P cherries
8	8 3/4 oz. (buffet size can) A & P fruit cocktail
2	8 3/4 oz. (buffet size can) Bartlett pears
2	7 oz. can Ocean Spray cranberry sauce
2	#2 can A & P grapefruit juice
2	1 1/2 oz. box A & P raisins
2	1 pint 8 oz. A & P grape juice
3	lbs. apples
3	lbs. grapes
4	cartons cokes
4	cartons ginger ale
6	12 oz. cans V-8 vegetable juice (1)
6	1 pint 1 1/2 oz. Campbell's tomato juice
3	10 1/2 oz. can Campbell's tomato soup
3	10 1/2 oz. can Campbell's chicken noodle soup
3	10 1/2 oz. can Campbell's beef noodle soup (1)
3	10 1/2 oz. can Campbell's vegetable beef soup
3	10 1/2 oz. can Campbell's chicken with rice soup (2)

5	#303 can A & P white potatoes
6	1 lb. 15 oz. can Sultana pork and beans
4	cans A & P asparagus tips (3)
4	#303 cans A & P green beans (1)
3	#3 can A & P sweet potatoes
3	#303 can A & P beets (3)
4	#2 can A & P tomatoes (4)
3	#303 can A & P sweet peas
4	#303 can Reliable cut wax beans
4	2 3/4 oz. D C potato sticks
4	14 oz. can A & P sauerkraut (3)
4	1 lb. can DelMonte carrots
2	2 oz. can Brandywine sliced button mushrooms (2)
2	12 oz. can Armour corned beef
2	12 oz. can Spam
3	6 1/2 oz.can Sultana tuna (1)
2	5 oz. can Banquet boned turkey (1)
3	1 lb. can Cold Stream pink salmon (2)
2	10 1/2 oz. can College Inn chicken a la king (2)
2	4 oz. can Armour vienna sausage (1)
2	6 oz. can Richard and Robbins boned chicken
2	12 oz. can Armour chopped ham
1	can Bif chopped beef
1	can Prem chopped pork and beef
2	can 12 3/4 oz. Krey salisbury steak and mushroom gravy
4	2 lb. 8 oz. Chef Boy-ar-Dee spaghetti (3)
2	2 lb. 8 oz. can Chef Boy-ar-Dee ravioli
2	2 lb. 8 oz. can Chef Boy-ar-Dee lasagna
2	12 oz. can Libby's roast beef
1	1 lb. can College Inn egg noodles and chicken
2	4 oz. jars Pream
1	1 pint jar Ann Page mayonnaise (3/4) - no bread
1	6 oz. Kraft cheese
1	6 oz. Nestles cheese
2	14 oz. tins Nabisco saltines
10	9 3/4 oz. box Starlac dry milk (3)
1	5 lb. bag Quaker sugar
1	2 oz. can Ann Page black pepper
1	1 lb. 10 oz. box Morton's salt (5/8) - may need more if
1	6 oz. jar Nescafe instant coffee heat and sweating
1	jar Nestea is a problem
1	14 oz. bottle Ann Page ketchup (1/2)
1	6 oz. jar Ann Page mustard
1	12 oz. jar Mr. Schlaren's sweet gherkins
1	pint jar Heinz pickles (1)
1	10 1/2 oz. jar Sultana olives

1 1 lb. jar Ann Page apricot jelly
1 12 oz. jar Ann Page apple jelly (1) - melted
1 1 lb. jar Ann Page grape jam (1) - melted
3 12 oz. jar Ann Page peanut butter (2)
2 1 lb. 6 oz. jar Coca Marsh
1 6 3/4 can cashew nuts
1 6 3/4 can peanuts
1 6 bar box Milky Way
1 6 bar box, assorted, Mars family bars
1 3/4 oz. package Heath bars
1 5 oz. pkg. Borden's veri-sharp cheese
1 1/2 lb. box Almond Joy
1 13 oz. box Baby Ruth
1 5 3/4 oz. Boyer's mallow cups
1 9 oz. bar OhHenry bars
1 9 oz. bag Letty Lane
1 11 oz. bag Hershey's kisses
1 6 1/4 oz. box tootsie rolls
1 10 oz. box 5th Avenue bars

BOOKS

Fuller - Danger! Marines at Work
Conrad - Heart of Darkness, Typhoon, Nigger of the Narcissus
Stein - 3 Lives
Steinbeck - Cannery Row
Cozzens - S. S. San Pedro, Castaways
Faulkner - The Sound and The Fury
Huxley - Eyeless in Gaza
Lawrence - Lady Chatterley's Lover

GAMES

1 set Monster and Caveman
1 " Blokhead
1 " Scrabble
1 " Customizing kit - car
1 " Clay Doodle
1 " Revell Model Kit - ships
1 " Dolly's Facial Kit
2 " Pre-School Box
1 " Vohe Pack

1 puzzle - Bears
1 " - Humpty Dumpty
1 " - Gingerbread Man
1 set Serving cards
3 books - Three Little Pigs, Red Hen, Puss in Boots
1 set Magic Dresses
1 set Fun cards
1 box blocks
2 toy trucks

EQUIPMENT

1 Bradley travel clock - winding
1 oil canvas
1 box paints
2 paint brushes
2 pair scissors
1 set rummy game
4 6 Volt Hotshot Eveready batteries
1 lantern - 6 Volt
1 CO_2 tester - Fyrite
1 O_2 tester-Fyrite
1 sling psychrometer - $\frac{\text{dry}}{\text{wet}}$ bulb
1 chafing dish
2 garbage pails - 20 gal.
38 gallons of water
1 chemical toilet
1 hot pad glove
4 knives
4 forks
5 spoons
1 small spoon
2 tablespoons
2 sharp knives
1 wooden spoon
4 candle reflectors
8 sheets
2 pillows
1 folding table - 9" x 12"
1 quart Seagram's whiskey
3 boxes Hot Cups
2 body thermometers
2 recording thermometers
1 card table

4 blankets
1 screw driver
1 pr. pliers
1 hammer

MATERIAL

1 pail - 12 quart
1 pair gloves - leather
1 pitcher - plastic
1 dishpan - plastic
1 box cups - 50 each
1 box Kleenex tissues
2 box Scotkins
1 box paper plates - 200
4 rolls Scot towels
4 rolls Delsey toilet paper
1 box Diamond matches
1 box Micky Mouse straws - 100
6 can openers
1 roll Scotch freezer tape - 90 ft.
1 box Reynolds Wrap - 75 ft.
1 box Saran Wrap
2 box Tavern candles - 12 each
7 box food warmer candles - 4 each
2 packages plastic bags - 12 each
1 roll Scotch cellophane tape - 1/2" x 800"
2 dozen disposable diapers
4 Namel paints
2 cement tubes
1 jar white paste
1 jar opener - Foley
2 ashtrays
4 bars Ivory - personal size
1 can Colgate's spice deodorant
1 Tap-Boy can opener
1 bottle Lestoil - 16 ounce
12 packages Wrigley's spearmint
12 packages Wrigley's doublemint
6 packages Beechnut peppermint
2 cartons Pall Mall cigarettes
2 cartons Parliament cigarettes

4 blankets
1 screw driver
1 pr. pliers
1 hammer

MATERIAL

1 pail - 12 quart
1 pair gloves - leather
1 pitcher - plastic
1 dishpan - plastic
1 box cups - 50 each
1 box Kleenex tissues
2 box Scotkins
1 box paper plates - 200
4 rolls Scot towels
4 rolls Delsey toilet paper
1 box Diamond matches
1 box Micky Mouse straws - 100
6 can openers
1 roll Scotch freezer tape - 90 ft.
1 box Reynolds Wrap - 75 ft.
1 box Saran Wrap
2 box Tavern candles - 12 each
7 box food warmer candles - 4 each
2 packages plastic bags - 12 each
1 roll Scotch cellophane tape - 1/2" x 800"
2 dozen disposable diapers
4 Namel paints
2 cement tubes
1 jar white paste
1 jar opener - Foley
2 ashtrays
4 bars Ivory - personal size
1 can Colgate's spice deodorant
1 Tap-Boy can opener
1 bottle Lestoil - 16 ounce
12 packages Wrigley's spearmint
12 packages Wrigley's doublemint
6 packages Beechnut peppermint
2 cartons Pall Mall cigarettes
2 cartons Parliament cigarettes

APPENDIX B

FIG. 1. EXPERIMENTAL FAMILY IN SHELTER

FIG. 3. ARTISTIC CREATION

FIG. 2 PROVISIONS

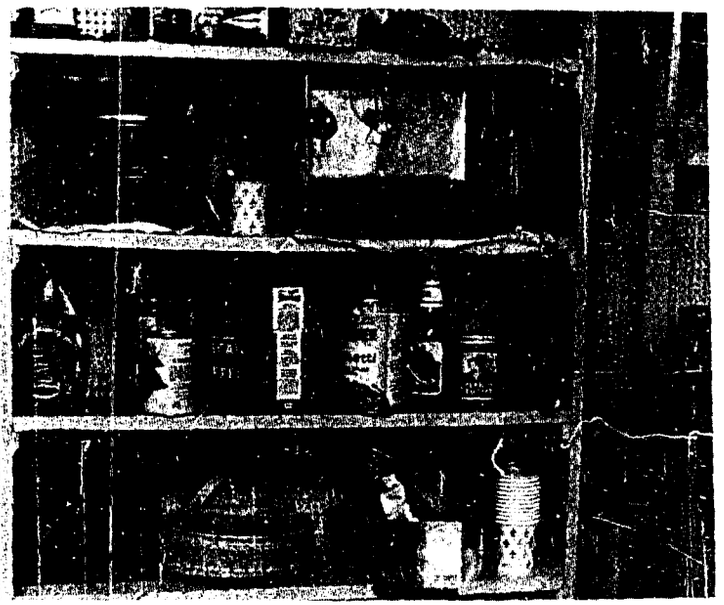


FIG. 4. SOME SHELTER EQUIPMENT