MEMORANDUM FOR: THE RECORD

SUBJECT: Contact with B+C

1. Under cover of being a consultant to visits were made to B+C on 11 and 12 February 1952. The arrangements for the meeting were made by

B+C

2. (Crude curare, a dried extract of certain South American plants, has been used as an arrow poison by South American natives for many years.)

C

(The pure material produces paralysis of voluntary muscles, which makes it a useful adjunct to anaesthesia in surgery.)

B+C

3. Curare had a very limited usefulness in medicine before the advent of pure d-tubocurarine chloride because the available products contained impurities which made the results from the use of the drug rather unpredictable. The form of the drug now available apparently produces essentially predictable results. Small doses of d-tubocurarine chloride produce relaxation of the skeletal muscles. Larger doses produce paralysis without producing anaesthesia or affecting the central nervous system. Death comes from a paralysis of the muscles which control breathing (apnoea). The alkaloid is usually injected as an aqueous solution; it is effective in 15 to 125 seconds if injected intravenously, in 8 to 12 minutes if injected intramuscularly. If introduced into the body by another procedure it is effective in 3 to 5 minutes. (But my guess is that he was referring to administration as an aerosol.) It is not particularly effective if taken orally.

B+C

4. EXHABEND
D-tubocurarine chloride in aqueous solution acts very rapidly, but the effect also decreases at a rapid rate. The rapid initial action is often desirable for medical use, but the short period of effective activity is often a serious difficulty. In order to overcome this difficulty, preparations of the alkaloid have been made by incorporating it in a slow absorption base capable of delivering a clinically effective dose at a constant rate over an extended period of time. A product prepared by

is incorporated in a base consisting of peanut oil, eycbcholatic derivatives, and beeswax; this is sold by Endo under the trade name "Tudeeii". Similar products are sold by Squibb (containing oil and paraffin), and Abbott (containing oil and wax). This material is of value in the treatment of traumatic injuries because a good deal of the pain and disability in many cases are due to muscle spasm. This can be controlled over long periods (12 to 24 hours with one injection) without the use of narcotics. The disadvantage of these preparations is that they must be varied before use to obtain a homogeneous preparation and it must be handled by a person experienced in giving injections.

e. Long-acting Curare Preparation for Self-administration

A long-acting curare preparation which could be readily self-administered (adaptable to use in emergency, for instance) or administered by trained or untrained individuals would be of great value in the immediate relief of pain and disability arising from injuries to troops or civilians during war-time conditions. In many cases a disabled person could be returned to immediate effectiveness in others the extent of disability could be materially reduced.

feels his experience and facilities will qualify him to develop a curare preparation suitable for this purpose; he feels he can prove or disprove the feasibility of his ideas within about four months. He would like to obtain a research contract to develop a preparation with these specifications: (1) Has an immediate curare effect; (2) Has a prolonged curare effect; (3) Can be used in oxygen type equipment; (4) Does not require preliminary heating or other preparation; (5) Produces standard predictable results.

He wants to produce several products, using different (curare-type) compounds and various formulations and subject them to preliminary animal experimentation. He can arrange for further animal experimentation and clinical tests on them can be done anywhere the may desire.

b. Curare Preparation for Field Service Gas Protection

believes he can produce a curare formulation which would be immediate-acting, can be self-administered (for instance, expenses), and which will be far superior to Nerve Gas Field Protection now available. This would be a different product.

from
from (a) above, and he has tried his ideas with anti-curare. He would like to have a research contract to develop his ideas. He proposes to prepare the formulations; animal and clinical testing would be up to

b. Remarks

(1) The above ideas were offered without being solicited or prompted by me. I was careful to try to neither verify nor deny any ideas he had which touched on classified interests; no classified information was knowingly volunteered by me to

(2) said the $20,000 to $25,000 estimate he made for a research project referred to a and b, above. The amount was given on the spur of the moment and does not represent a considered estimate. If the expresses an interest, he will submit a more considered estimate and break the figures down to individual items.

(3) If he gets a contract from he intends to obtain the services of (later he will probably become associated with his whether he gets a contract or not)

(4) continued these men as being acquainted with his work and the general field:

5. IMPLICATIONS

The following ideas on current uses for curare were obtained during the discussions with:

a. Partially purified curare was used successfully by South American natives to kill grass and enemies. The material is put on the tip of spears or blow darts and it produces an almost immediate paralysis of the victim. described native methods and results and showed specimens of the equipment.

b. in 1941 concerning possible Military uses for curare alkaloids. At that time there was interest because the Germans seemed to be quite interested in crude curare. It was found that very finely divided crude curare (preferably of the strychnos type) plus a mental irritant had an almost immediate paralyzing effect when released as an aerosol or powder. He felt the main difficulty with curare

for

-3-
for military use was the rarity of the material (this would be
an disadvantage for covert use). There are many water-soluble
phystostigmas with powerful physiological properties in crude
curare, and the nasal irritant greatly increased the rate of
absorption of the toxic material.

c. The situation has rapidly changed since 1941, so that now
far more potent agents can be obtained from crude curare. The
crude material contains teniferone compounds for military (covert)
use would be comparatively difficult because of the time and work
it would take to extract, identify, and test individual teniferone
compounds.

d. Partially purified crude curare would be easy to obtain and
have possibilities for military (covert) uses. It is more potent
than pure d-tubocurarine chloride. It has both the d-tubocurarine
chloride properties and what are usually considered undesirable side
effects for curare used in medicine. These additional effects
involve histamine-like reactions. The material plus a nasal irritant
should have an immediate powerful effect in small amounts, when
released as an aerosol or powder. It would be very effective if
introduced within the body by a dart, etc. It has little or no
effect if it gets into a small break in the skin or if taken orally.

o. apparently is primarily interested in the defensive
use of curare, but he said he would very willingly cooperate in any
way he could in anything involving the defensive or offensive
use of curare alkaloids.

5. ACTION:

a. Pass the information in paragraph 3 along to
for whatever action they feel desirable.

b. Obtain a TOP SEC. security clearance for
pursue the potential covert uses of curare alkaloids further.

Research & Development

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MEETING FOR: THE RECORD

SUBJECT: C Initial Contact with

1. On this day, the writer contacted The
   contact was made through 00 field
   station. accredited me to as a CIA representative
   and then left and the writer alone.

2. the constrictor substance, benzedrine, and other similar drugs.

3. central nervous system depressants and stimulants, both in their peripheral
   and central manifestations.

4. It is the writer's feeling that small, very sensitive problems could be very
   securely carried out.

5. The following specific facts were brought out in our discussion:
   a. Indole analogue of benzedrine mentioned a
      very interesting substance which they ran across in their
      benzedrine researches. It is the indole analogue of benzedrine.
When given at a dosage of 50 mg orally this compound gives the subject a profound depression - just the opposite of euphoria. It apparently gives a deep-seated depression of the central nervous system which extends into the mental sphere of mood and alertness. They didn't look into this any further because it produced this very undesirable reaction. thinks that many indole derivatives should be studied for this type of activity.

b. LSD - The discussion touched on LSD only insofar as it inquired as to whether anyone was looking into indole derivatives as structural analogues of LSD. He thought this field should be studied intensively in order to find compounds much simpler than LSD in structure that have the same kind of activity. He suggested that we find out what has done in indole compounds.

c. Methylene dioxyl benzedrine - has answered the fact that the methylene dioxyl analogue of benzedrine produces hallucinations, mental images and mental confusion in doses of 100 mg taken orally. Their studies on visual imagery and knee-jerk reflexes indicate profound CNS effect for this type of compound.

d. Quaternary Quats - They discovered that the hexadecyl tributyl ammonium ion has very high toxicity administered intravenously in gram quantities.

e. Capsaicin - in conjunction with researches on "drying methylene benzedrine inhaled", found that capsaicin, the active principle of chili pepper, and some simpler synthetic analogues were very effective in producing a harmless burning sensation on contact in extremely low concentrations.

f. Marijuana - indicated that a more or less comprehensive piece of research had been done during the last war at the under on the efficacy of Marijuana for eliciting information. didn't know any of the details.

g. - indicated that the person in this country that he thinks is most highly qualified in the field of pharmacology along the lines in which we are interested in

6. - indicated that he would be willing to fill out a PHS form if we so desired.

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MEMORANDUM FOR: MR. INWOOD

SUBJECT: Contact with

1. This day the writer briefed on certain research interests and needs of NUD. A detailed tour of the was also made later in the day. aside from the potential involved in his own scientific museum and in those of his is obviously in intimate touch with practically all the chemical and pharmaceutical manufacturers on the . He makes trips to Washington frequently and has agreed to call the writer when he is in town.

2. The contact with was made through of the CO Field Station who introduced the writer as a CIA representative and then left.

3. have a technical staff of about professional chemists, biochemists and engineers, and are currently actively engaged in research in the following fields:

4. The physical facilities of the laboratory seem to be adequate to do effective work in these fields and the personnel that the writer contacted seemed well trained and enthusiastic.

5. 
5. indicated that he would be glad to originate or facilitate procurement of small orders of specialty chemicals where this would be of assistance to us.

6. It is the writer's opinion that facilities could be of considerable use to us in the following ways:

a. To handle small problems in applied chemical and biochemical research.

b. To help procure small amounts of sensitive or difficultly obtainable chemicals.

c. To keep us advised of chemical research activities in our fields of interest on the

7. will be happy to fill out a MRS.

Distribution:
Address: 1st
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E. Harum
MEMORANDUM FOR: THE MAJOR

SUBJECT: Contact with

1. Under cover of being a consultant to

2. [Redacted] was contacted to discuss the technical aspects of the
dog loser problem. In general [Redacted] proved to be an exceedingly
competent scientist, combining a brilliant, incisive intellect with
versatile interest in all phases of human psychology.

3. [Redacted] disqualified himself and his department from any
work on sensory perception in dogs, pointing out that they had not
a great deal of specific experience with dogs as subjects, nor did they
have people strong in the chemical and "gadgeteering" disciplines
necessary for this kind of work. A detailed discussion of the dog
problem indicated that [Redacted] felt very strongly that the basic part of
the research should be handled by a research psychologist, strong in
cooperative animal psychology and with a good background in the disci-
plines mentioned above. He suggested the following as some likely
candidates:

4. Entirely unsolicited, [Redacted] mentioned some ESP work in
dogs recently reported in the Journal of Parapsychology. This led to
a general discussion by him of ESP,

British
British work in this field. The writer evinced no interest in this, but it was obvious that [name] was vitally interested in this subject, and his discussion of the subject revealed the following points:

1. [Name] thinks that ESP is well proven, and they are starting work in this field at [place]. The main difficulty is in providing "hot" subjects; none have been uncovered yet.

2. The British work is much better than the Duke work to date. It is more imaginative and the experiments are much better laid out.

3. Himself is too wrapped up in trying to prove a theological point to be a completely effective experimenter.

4. Much experimental work can be done in this field.

5. The [name] is interested in getting financial support for such work.

6. Should we desire, [name] indicated a willingness to fill out RFS forms. The writer thinks this would be an excellent addition to RED's group of consultants, since we have no one cleared at the consultant level who is thoroughly competent to discuss various psychological problems.

Distribution:
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RFS - 1
CBS Chrome
1. On this date, the writer consulted on the basis of an appointment made by OSI. The purpose of the visit was to get a critical appraisal of the contemplated research program on various chemicals for use in covert warfare.

2. In a discussion of the production of retrograde amnesia by chemical means, dwelt at some length on two physical techniques which he had previously discussed with:
   a. Electrosleep - believes that electrosleep, repeated three or four times in the space of one hour, should produce a high degree of retrograde amnesia. He said it would be almost impossible for them to test this experimentally at , because of the severity of the treatment to the patient.

   b. "Icepick Operation" Use electrosleep to produce anesthesia, a Washington surgeon has many times successfully performed an operation involving piercing the brain with a fine surgical "icepick" and destroying certain frontal brain tissue, with nervous confusional and amnesic effects. This operation leaves no marks on the skin.

3. The possibilities of using Br₂(N₂)₆, priloc, antina, high O₂ tensions, anti-vitamins, Be, and LSD was discussed with . He thought they all offered some promise, but would place high O₂ tensions and anti-vitamins at the bottom of the list. He thought that research to answer our specific questions on each of these substances was needed, particularly in the case of LSD. He was asked if any of the work he was aware of could answer our needs. His opinion was that experimental work specifically designed to our operational needs would provide the answers.

4. Mentioned the Hypodermic Injector and was pleased to bear that we were working on it. He gave the writer some interesting literature on amnesia.
b. Glycerol Acid - It is known that giving repeated doses of glycerol acid acts as a slow continuous stimulant to the adrenal medulla, which produces a constant slight excess of adrenalin in the blood, producing a peculiar type of hyperreactivity, with a stage of mental confusion. Dr. Smith is interested in a very comprehensive experiment to pin down the parameters of this effect in normal and psychotic patients.

c. Adrenalin Substitutes - Adrenalin, with its effect on acetyl choline acetylase is of great interest in several forms of mental disease. Acetyl choline is the mediator for the nervous system and in his work on 0-genes, for developing adrenalin as the effective protective agent. In mental disease like Parkinson's disease and epilepsy, adrenalin like compounds with a minimal peripheral effect and maximum central effect are needed. Extensive research is being undertaken at the Hospital to uncover such compounds.

4. Other points brought up in a general discussion of our requirements were:

a. Vitamins B, Deficiencies - Since the brain can use only carbohydrate for energy, and since the metabolism of Kreb's cycle, B deficiencies have functional brain disturbances. Acute B deficiency actually causes permanent degenerative brain damage. This would seem to open the possibility of using thiamine antagonists to produce confusional and other mental states.

b. Listlessness - Dr. Smith thinks that a rational approach to our urgent operational requirement for a chemical producing a general listlessness and listlessness might be in a compound which produces a general ataxia. He pointed out that the general listlessness and lack of productivity of the very low income groups in the southeastern U.S. is due to ataxia for vitamins B, B, C and nicotinic acid.

5. ___ indicated a desire to help in any way possible, urged me to consult further with him, and indicated his willingness to fill out a PES form. He also promised to send us a copy of his research proposal to the

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2. Discussed chemicals which have been found to temporarily inactivate or permanently destroy specific portions of the nervous system. Keto benzodion is one such drug. It is used in Europe to some extent in the treatment of drug addicts.

3. If monkeys are exposed to heavy and repeated doses of ethylene oxide they lose the function of their spinal chord, but the normal function returns after removal from the gas. Accidental human poisonings have indicated a similar effect from ethylene oxide. The concentration of chemical required make it out of the question for covert activities, but the results are suggestive.

4. Said they have recently received some material called yoga dite from Mexico. He was not certain about its chemical composition, but it is made from a Mexican plant and is used as an insecticide.
insecticide or rodenticide (he wasn't sure which) in South America. If 100 micrograms/kg are given orally to a dog it produces muscular spasms of long duration. The spasms begin fairly immediately. This material is being investigated in the present time.

5. We are also working on methadone. Some of these compounds produce an extended (36 to 48-hour) loss of consciousness and irreversible paralysis. In monkeys there is an apparent effect from the compound until a couple of hours or so after the drug is given. This group of compounds should be screened.

6. It has worked on some of the clinical aspects of the methadone, but has had some difficulties, so it is not certain whether he will continue this line of investigation. We mentioned another possibility for work on methadone. We feel that histo chemical studies would yield results in this field.

7. In the field of chemicals which produce mental derangement, he doubted that anything would be found superior to LSD. He doubts that meadonine will prove of much value. He questions the value of cannibal compounds, but mentioned in this field. He said that meadonine intoxication is probably due to meadonine, and that meadonine would probably give similar results.

8. We wondered if methyl bromide would be of value in guerrilla-type warfare. He pointed out it is an obstinate gas and is quite potent.

9. We would be happy to do work for us in his specific fields of interest. We've been working primarily in animal work and is not equipped to synthesize organic chemicals. Since he at present has a contract with them, nothing specific will be discussed in regard to work until it can be determined that it can be done without running into competition with the

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DRAFT
21 February 1952

a. 
was questioned on the evening of 2 February 1950.

b. 
was approached under the cover of a consultant to appear to be very security conscious. He expressed his continuing concern about security and asked to see the writer's identification.

c. 
appeared to have an unusual degree of knowledge and interest in chemistry, in the general field under discussion are inhibitors of glucose combustion and acetyl choline esterase inhibitors.

d. 
said that thiochrome had been suggested as a glucose combustion inhibitor. (Review: Textile, Physiol. Rev., 29, 389 (1949)). However it is improbable that thiochrome could be developed into a good covert weapon. Since it is a protein it is ineffective if given by mouth; it must be injected or inhaled. I felt that the amount required to effect a person with an adequate diet would be rather large for optimism value as a covert weapon. Anti-thiochrome compounds were discovered, but they do not seem to be too promising as covert weapons because of the comparatively large amounts which would probably be required to produce a noticeable effect on an individual with an adequate diet.

e. 
mentioned radioactive aecidrinc acid. This appears to have possibilities as a covert weapon. It may be effectively given by mouth, injection, or inhaled, and it tends to be concentrated in glandular tissue. indicated that a very small amount of the material
material would produce destruction of the adrenal cortex. Even a slight
damage to the adrenal cortex would produce symptoms characteristic of
Addison's disease—disturbances in sodium and potassium metabolism and in
glucose metabolism. Severe Addison's disease, if not properly treated,
will result in death. Since Addison's disease is not well understood
and radioactive strontium would be comparatively easy to distinguish,
it is felt this possibility should be further investigated.

C gave the names of several individuals who are
active in this general field.

D. felt that sedatives such as barbiturates are about
as good as anything he knows as interrogation aids. He thought alcohol was
about as good. He felt choline esterase inhibitors should be investigated
as antipolygraph aids.

E. He said various shock treatments are effective in producing
amnesia. Insulin shock is not effective. Metrazol shock is effective, but
it is a sloppy method then used in actual practice. Proper dose, rate of
injection, etc., are difficult to determine for the production of a
given effect. He thought that several repeated electric shock treatments
given in one day was the most satisfactory procedure. Under proper
conditions this will produce temporary amnesia lasting for a couple of
weeks.

He said the Japanese used ordinary 110 volt alternating
current in psychiatric practice during the war with apparently satisfactory
results. He said alternating current produces more confusion than does
rectified alternating current, and a square wave rectified current
produces the least confusion. There is a discussion of this in a recent
issue of the Bulletin of Mathematical Biophysics.

9. mentioned an advertisement he had seen to—
about a polysaccharide or protein
sold under the trade name "Pyroase". A dose of 1 or 2 mg. gives a
fever of less than a degree, but a ten-fold increase in dose would
produce
produce a definite elevation in body temperature. Although the chemical
nature of this material would indicate it would not be effective if given
orally, it should be effective as an aerosol.

10. Actions Further investigation of possibilities of radioactive
sources, use of shock treatment to produce anesthesia, and of "Pyroman".

Chemical Branch
Research & Development
1. This date the writer contacted [redacted] under the cover of being a consultant to [redacted] on a special project for the covert use of chemicals.

2. An extensive inspection of the laboratory facilities under immediate control indicated the following things:

b. Excellent facilities exist for any type of medical research involving physiologically active chemical compounds. Human subjects would be available for work that could be carried out as legitimate medical research. Extensive animal facilities exist for other kinds of research.

c. Contractual arrangements via the [redacted] method would be very feasible. [redacted] indicated that it would be necessary for only one other person to know what he was doing and he therefore suggested that both he and [redacted] be cleared for this sort of work. [redacted] indicated that he would be happy to fill out FER forms.

d. Current work in the laboratory is centered mainly around sterilization of blood by chemical agents to destroy virus and spore bodies.
b. Beryllium - There's a considerable literature, most of it stemming from recent accidents involving broken fluorescent lighting equipment, on the extreme toxicity of beryllium. This is certainly the most toxic inorganic element and it produces a peculiar fibrotic tumor at the site of local application. The amount necessary to produce these local tumors is a few micrograms. It suggests a study of the effect of inhaling small amounts of beryllium in the lungs, and other studies to evaluate the potentialities of beryllium as a covert weapon.

4. I thought his ________ could do an effective job of studying anti-LSD agents by finding one or more objective syndromes of LSD application in laboratory animals and screening compounds that might combat its action. He was invited by the writer to develop this into a research proposal if he so desired. It was emphasized that no commitment of any kind was involved in our acceptance of a research proposal.

5. The follow-up actions indicated by the above discussions are:

a. Send FBI form to ________ for himself and ________

b. Start efforts to get information on highly active processes from ________

c. Start preliminary investigation on potentialities of beryllium
was conducted on 3 February 1953. The context with was made with the assistance of and the investigator approached as a representative of . The discussion with was limited to the subject of curare-like agents. A colleague of who is interested in toxic curare compounds and artificial respiration, was not available because of illness.

2. Crude curare is obtained by burning roots, bark, etc., of several species of South American plants. It contains powerful alkaloids and is used by certain South American tribes as an arrow poison. An individual or animal struck by such a poisoned arrow is rapidly rendered helpless due to paralysis of the skeletal muscles. Purified curare and chemicals having a curare-like action are used to some extent in medicine, when it is desired to produce a relaxation of the skeletal muscles without the production of anesthesia or the production of central nervous system paralysis.

3. It is said that a large number of curare-like chemicals (acetyl choline blocking agents) have been prepared and screened by pharmaceutical houses such as Merck and Dohn, Burrough Wellcome Co., Eli Lilly, Abbott, etc. A few substances which met medical requirements are now on the market, but so many which would more nearly meet our requirements have been discarded. It is said that if we were to set down the desired specifications for a drug with curare-like action, and then canvassed the drug houses, we would undoubtedly find that a drug which meets the specifications has been screened. This might be a rather optimistic statement, but since a potent curare-like agent would be of value in covert activities, an effort should be made to see what can be obtained by this method.

5. expressed an interest in clinical testing of curare-like compounds, but not at the

6. Action:

   a. Obtain information about curare-like compounds which have been screened by pharmaceutical houses.

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