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AKTICHOKE

A/10, I, 64, 7

DRAFT
27 February 1952

11

224 pages

MEMORANDUM FOR: THE RECORD

SUBJECT: Contact with

1. Under cover of being a consultant to
visits were made to

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 anesthesia in surgery.)

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 amounts produce paralysis without producing anesthesia 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 12 to 15 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.

C

(but my guess is that he was referring to administration as an aerosol.) It is not particularly effective if taken orally.

4. REMARKS

RESEARCH PROBLEMS FOR MEDICAL APPLICATIONS

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 uses, 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, cyclohexanol derivatives, and beeswax; this is sold by Endo under the trade name "Tubedil". Similar products are sold by Squibb (containing oil and styroin) 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 spasms. 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 varmed before use to obtain a homogeneous preparation and it must be handled by a person experienced in giving injections.

a. Long-acting Curare Preparation for Self-administration

A long-acting curare preparation which could be readily self-administered (adaptable to use in ampens, 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 ampens 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 if they can be done anywhere they may desire.

b. Curare Preparation for Field Nerve Gas Protection

_____ believes he can produce a curare formulation which would be immediate-acting, can be self-administered (for instance, ampens), 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-curaries. 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

B
C
D

(2) _____ said the \$20,000 to \$25,000 estimate he made to _____ 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.

B
D

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

C
D

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

5. IDEAS ON CURARE USE

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

C

a. Partially purified curare is used successfully by South American natives to kill game 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

C

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 nasal irritant had an almost immediate paralyzing effect when released as an aerosol or powder. He felt the main difficulty with curare

B

for

for Military use was the rarity of the material (this would be no disadvantage for covert use). There are many water soluble phytotoxins 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 toxic compounds for Military (covert) use would be comparatively difficult because of the time and work it would take to extract, identify, and test individual toxic 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. This 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.

e. _____ 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 SECRET security clearance for _____ and pursue the potential covert uses of curare alkaloids further.

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which are extremely toxic. However, developing toxic compounds.

C.F.B., I, G.Y., Z

A

DRAFT-
9 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: C Initial Contact with _____

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

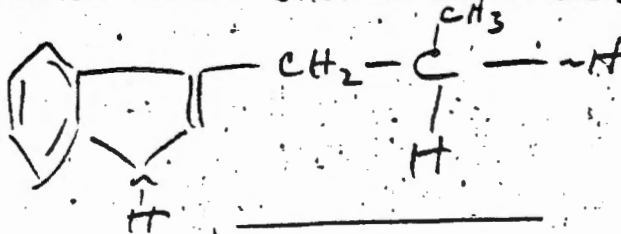
2. _____
the constrictor substance, benzedrine, and other similar drugs.

3. _____ central nervous system depressants and stimulants, both in their peripheral and central manifestations. _____ to conduct active research where _____ facilities and competence could be effective. _____ of any new substances or other matters of interest to us in the general field of chemical materials that might be of use to us.

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 _____ 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 dextro benzedrine - _____ has answered the fact that the methylene dextro 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 reflex indicate profound CNS effect for this type of compound.

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

e. Capsaicin - _____ in connection with researches "denaturing benzodrine inhalers", found that capsaicin, the active principle of red 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 pharmacopsychology along the lines in which we are interested is _____

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

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A/B, I, 64, 3

11 February 1952

MEMORANDUM FOR: THE DIRECTOR

SUBJECT: Contact with [redacted]

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

2. The contact with [redacted] was made through [redacted] of the [redacted] CO field station who introduced the writer as a CIA representative and then left.

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

[Large redacted area]

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. [redacted]

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 FIS.

A _____
Classical Search
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A _____

CAB 2, 64, 4

7 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Contact with

1. Under cover of being a consultant to _____ was contacted to discuss the technical aspects of the dog loser problem. In general _____ proved to be an exceedingly competent scientist, combining a brilliant, incisive intellect with versatile interest in all phases of human psychology.

2. _____ 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 "gadgetsoring" disciplines necessary for this kind of work. A detailed discussion of the dog problem indicated that _____ felt very strongly that the basic part of the research should be handled by a research psychologist, strong in comparative animal psychology and with a good background in the disciplines mentioned above. He suggested the following as some likely candidates:

[Redacted section]

3. Entirely unclassified, _____ mentioned some ESP work in dogs recently reported in the Journal of Parapsychology. This led to a general discussion by him of ESP, _____ work and very recent

British

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

- a. _____ thinks that ESP is well proven, and they are starting work in this field at _____. The main difficulty is in providing "hot" subjects. None have been uncovered yet.
- b. The British work is much better than the Duke work to date. It is more imaginative and the experiments are much better laid out.
- c. _____ himself is too wrapped up in trying to prove a theological point to be a completely effective experimenter.
- d. Much experimental work can be done in this field.
- e. The _____ is interested in getting financial support for such work.
- f. Should we desire, _____ indicated a willingness to fill out FBI forms. The writer thinks _____ would be an excellent addition to NED's group of consultants, since we have no one cleared at the consultant level who is thoroughly competent to discuss various psychological problems.

A

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 Research & Development

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DRAFT.

7 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Discussion held with _____

1. On this date, the writer contacted _____ on the basis of an appointment made by _____ OSI. The purpose of the visit was to get _____ 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:
- Electroshock - _____ believes that electroshock, 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.
 - "Icepick Operation" - He used electroshock to produce anesthesia, a Washington surgeon has many times successfully performed an operation involving piercing the brain just over the eye with a fine surgical "icepick" and destroying certain frontal brain tissue, with nervous confusional and amnesia effects. This operation leaves no marks on the skin.
3. The possibilities of using $H_2(Et)_2$, privinc, meprobamate, high O_2 tensions, anti-vitamins, Be, and LSD was discussed with _____. He thought they all offered some promise, but would place high O_2 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 Hypospray Injector and was pleased to hear that we were working on it. He gave the writer some interesting literature on amnesia.

 _____, Chemical Branch
 Research & Development

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C 4/10, I, 16/1, 6

DRAFT. _____
6 February 1952

MEMORANDUM FOR THE RECORD

SUBJECT: Contact with _____

C+H

1. Under cover of being a consultant to _____ of the _____ a visit was made to _____ has been research director of the hospital for about a year having just been _____
_____ of the important text recently published

C+H
B
C

3. The current research effort at _____ is being directed along the following three lines, with very prospects in the planning stage:

- a. High Oxygen Tensions - _____ a research proposal entailing to study the effect of high oxygen tensions in normal and psychotic patients. (In all research at _____ normal controls are available from volunteers and the hospital staff). If the content of oxygen in a preparatory gas mixture is reduced from the normal 80% to 50%, mental confusional effects become apparent in both normal and psychotic patients. The interest in this arises from the fact that practically all of the elderly psychotic patients have cerebral arterial sclerosis, which means that the brain is not getting enough oxygen. This is a relatively uncharted field, with obvious implications for our requirements.

B+C

b. Cortisone Acid - It is known that giving repeated doses of cortisone 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 hyperactivity, with a stage of mental confusion. _____ is interested in a very comprehensive experiment to pin down the parameters of this effect in normal and psychotic patients.

c. Atropine Substitutes - Atropine, with its effect on acetyl choline esterase is of great interest in several forms of mental disease. Acetyl choline is the mediator for the nervous system and in his work on G-gases, _____ for developing atropine as the effective protective agent. In mental disease like Parkinson's Disease and epilepsy, atropine 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. Vitamin B₁ Deficiencies - Since the brain can use only carbohydrate for energy, and since the metabolism of Krebs's cycle, B₁ deficiencies have functional brain disturbances. Acute B₁ avitaminosis 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 - _____ thinks that a rational approach to our urgent operational requirement for a chemical producing a general listlessness and lethargy might be in a compound which produces a general avitaminosis. He pointed out that the general lethargy and lack of productivity of the very low income groups, in the southeastern U. S. is due to avitaminosis for vitamins B₁, B₂, C and nicotinic acid.

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

Chemical Branch
Research & Development

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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 _____ at the present time.

5. _____ are also working on methadols. Some of these compounds produce an extended (36 to 48-hours) loss of consciousness and reversible paralysis. In monkeys there is no apparent effect from the compounds until a couple of hours or so after the drug is given. This group of compounds should be screened. _____ said that

_____ has worked on some of the clinical aspects of the methadols, but he has had some difficulties, so it is not certain whether he will continue this line of investigation.

_____ was mentioned as another possibility for work on methadols. _____ felt that histo chemical studies would yield results in this field.

6. In the field of chemicals which produce mental derangement, he doubted that anything would be found superior to LSD. No doubts that reserpine will prove of much value. He questions the value of cannabinol compounds, but mentioned

_____ in this field. He said that mushroom intoxication is probably due to muscarins, and that prostigmine would probably give similar results.

7. _____ wondered if methyl bromide would be of value in guerrilla type warfare. He pointed out it is an odorless gas and is quite potent.

8. _____ would be happy to do work for us in his specific fields of interest. He is interested primarily in animal work and is not equipped to synthesize organic chemicals. Since _____ at present has a contract with _____, 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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A/B, I, 64, 8

DRAFT
21 February 1952

MEMORANDUM FOR: THE DIRECTOR

SUBJECT: Interview with _____

_____ was contacted on the evening of 3 February 1952.

2. _____ was approached under the cover of a consultant to _____ appeared to be very security conscious. He expressed his continuing concern about security and asked to see the writers' identification.

4. _____ 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.

5. _____ said that thiaminase had been suggested as a glucose combustion inhibitor. (Review: Tutkin, Physiol. Rev., 29, 389 (1949)). However it is improbable that thiaminase 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. _____ felt that the amount required to effect a person with adequate diet would be rather large for optimum value as a covert weapon. Anti-thiamin compounds were discussed, 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.

6. _____ mentioned radioactive ascorbic 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 tissues. _____ 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 acetic acid would be comparatively easy to disseminate, it is felt this possibility should be further investigated.

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

7. _____ 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.

8. 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 when 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 sent to _____ about a polysaccharide or protein sold under the trade name "Tyronax". A dose of 1 or 2 _____ 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 ascorbic acid, use of shock treatment to produce amnesia, and of "Pyromax".

A
Chemical Branch
Research & Development

DRAFT

February 1952

MEMORANDUM FOR: THE DIRECTOR

SUBJECT: Initial contact with _____

1. This date the writer contacted _____ under the cover of being a consultant to _____ 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 _____ method would be very feasible. _____ indicated that it would be necessary for only one other person to know what he was doing and he therefore suggested that _____ be cleared for this sort of work. He indicated that both he and _____ would be happy to fill out FBI forms.

d. Current work in the laboratory is centered namely around sterilization of blood by chemical agents to destroy virus and spore bodies.

C
CXB

CXB

C

B

C

CXB
C

boties. An extensive program of organic chemical research supports this work. An active interest in many medical-clinical research problems exists, but _____ and other people seem to be very well up on the current status of research in chemical medicine.

a. _____ is in constant close contact with clinicians, surgeons, psychiatrists in his capacity as _____ to them and will keep us informed of any matters in the medical field of interest to us.

3. _____ mentioned two specific current items which he thought should be of interest to us:

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. _____ 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.

b. _____ 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 pressed substances from _____
- c. Start preliminary investigation on potentialities of beryllium

1913, 2, 64, 11

SECRET
23 February 1952

MEMORANDUM FOR THE DIRECTOR

SUBJECT: Discussion with

C+A

1. _____ was contacted on 3 February 1952. The contact with _____ was made with the assistance of _____ and the undersigned 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 brewing 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. _____ said that a large number of curare-like chemicals (acetyl choline blocking agents) have been prepared and screened by pharmaceutical houses such as Parke and Davis, Burrough Wellcome Co., Eli Lilly, Abbott, etc. A few substances which meet Medical requirements are now on the market, but he said many which would more nearly meet our requirements have been discarded. He said that if we wrote 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.

4. Several investigators mentioned who are active in synthesizing or testing compounds of the curare type: D. Dovat, H. J. De Boer, J. O. Hoppe, A. R. McIntyre, W. B. H. Paton, E. H. Covringham. The work of these and other men is described in the book "Curare and Anti-Curare Agents" published by the New York Academy of Science.

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.

A _____
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