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SOME SIGNS, FINDINGS, AND INTERPRETATIONS OF CRIMINAL ABORTION

William E. B. Hall

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In consideration of the subject of criminal abortion, I shall present four specific items:

1. Gunpowder as a chemical abortefacient.
2. Myiasis or insect larval infestation of the uterus as evidence of instrumentally induced abortion.
3. Erythema as an indicator of certain types of chemical abortefacients.
4. Organisms in the capillaries of the fetal placental villi as positive evidence of criminal abortion.

GUNPOWDER AS A CHEMICAL ABORTEFACIENT

During the present military occupation of Germany, medical officers¹ learned that certain of the female population of that country were accepting the risks of pregnancy much more readily than was the experience in other lands. This was due to a current understanding and experience that abortions could be readily induced, apparently with much less danger or inconvenience than was ordinarily expected. Inquiry has shown that gunpowder was being used effectively as an abortefacient. The pregnant woman would swallow one to two grains of powder previously removed from ammunition cartridges, usually those used with the Mauser field rifle. This would result in a prompt, severe, penetrating illness, lasting approximately 24 hours, characterized by anorexia, nausea, vomiting, diarrhoea, abdominal pain, and not-infrequently collapse and coma, during which the abortion would usually be effected. Recovery was rapid and complete. So far, I have learned of no deaths,¹ but knowing the agents used, I would fully expect an amply lethal effect from the injudicious ingestion of the chemicals. Smokeless powders universally have as a base nitro-cellulose² to which are added in certain countries:

- (a) Accelerators, such as nitroglycerin, fulminate of mercury, and pentaerythritol tetranitrate (PETN).
- (b) Oxidizing agents as potassium nitrate, barium nitrate, ammonium nitrate, potassium chromate, and potassium bichromate.
- (c) Gelatinizing agents, as acetone, ethyl alcohol, ether-alcohol mixtures, ethyl acetate, etc., all of which are lost by evaporation in intermediary stages of preparation.
- (d) Controlling stabilizers such as diphenylamine, phenyl- α -naphthalamine, naphthylamine, urea, etc., or combined regulators, binders and insulators which are basically carbons or hydrocarbons such as graphite, colophony (resin), camphor.
- (e) Anti-acids such as calcium carbonate (chalk), sodium bicarbonate.
- (f) Lubricants as vaseline, wax, castor oil, paraffin.

Most of these agents are toxic, sometimes in very small quantities but are rarely to be encountered in American ammunitions.² Their frequent use in overseas ammunition is to be noted. This is with particular reference to the oxidizing agents, potassium nitrate and barium nitrate, the accelerator pentaerythritol tetranitrate (PETN) and the stabilizer diphenylamine, which are encountered in German smokeless ammunition powders. The potassium nitrate is lethal in doses as small as 30 gms. and causes severe gastric pain, diarrhoea, bloody stools, collapse, lividity, coma, and death. Barium nitrate is lethal in doses as small as 15 gms. and causes nausea, vomiting, localized and generalized convulsions, diarrhoea and tenesmus, severe shock, motor and sensory loss, cardiac and respiratory embarrassment. Latest reports⁴ show no late war use of barium nitrate or potassium nitrate in German propellants. Most commonly used nitrates were pentaerythritol tetranitrate (PETN) and diethyleneglycol dinitrate (DEGN)³ usually combined with diphenylurethane or allied urea compounds. Which of these is responsible for the abortefactive action is not clarified, but the apparent effect is produced as smooth muscle irritants and ecbolics, and as lethal agents acting on the embryo itself.

MYIASIS OR INSECT LARVAL INFESTATION OF THE UTERUS, AS EVIDENCE OF INSTRUMENTALLY INDUCED ABORTIONS

Insect ova are deposited and their larvae appear on the human body and within its wounds, passages, and cavities, of both the living and dead. Each species of such parasites tends to choose a particular site

in the living or appears in the dead at specific and different stages of body disintegration. The identity of the infesting agent and the particular stage of its development afford a very satisfactory index of the timing of death. Egg-laying insects are particularly constant in the type of organic material in which their eggs are deposited. As a result, the discovery of larvae of the common house-fly in the human uterine cavity warrants presentation of this feature as evidence of an instrumentally induced abortion. The common house-fly (*Musca domestica*) deposits its eggs on manure. Reports of oviposition by this fly on dead or living bodies are quite rare.

Report of Case. The case of myiasis of the uterus occurred in a white, unmarried girl, age 18, who was admitted to the hospital with a history of 8 hours duration, of increasing generalized abdominal pain, tenderness, distension, nausea and vomiting, with elevated temperature of 100.2 degrees. There was a moderate bloody vaginal discharge. Though the patient denied pregnancy or abortion, a diagnosis of post-abortional puerperal sepsis and septic peritonitis was made. In spite of all measures there was no improvement in the patient's condition. Additional history, shortly before death, was obtained to the effect that the patient had induced her own abortion using a narrow stick found on a manure pile in her own farmyard. Death occurred just over 48 hours after admission to the hospital and about 80 hours after the induced abortion. At autopsy, in addition to generalized streptococcal peritonitis, puerperal metritis, and fragments of fetal villi and decidua in the uterus, there were found in the uterine cavity fourteen (14) actively moving insect larvae or maggots, subsequently identified as second stage larvae of the common house-fly. At outside limits, the life history of the house-fly allows 8 to 12 hours for the eggs to hatch, a first larval stage of 36 hours, a second larval stage of 24 to 48 hours and a final larval stage of 3 to 4 days before the pupal stage. The above limits of 66 to 96 hours from the time of deposition of eggs to the termination of the second larval stage as found at autopsy, correspond well with the apparent eighty (80) hours as the claimed time of abortion to the time of death of the victim.

Myiasis is the term describing the deposition of insect eggs and the subsequent development of their larvae in the living body. The insects concerned are attracted to the body by odor, sometimes from a very long distance. Certain insects are attracted by particular species of living animals including human beings. Other insects are attracted by organic material including manure, fresh meat, or fresh dead bodies. Some insects appear solely in the more advanced stages of organic dis-

integration and putrefaction. Identity of the infesting larvae will termine the state of the body at the time of oviposition. Identity the stage of larval development determines the length of time fro oviposition to discovery of the body.

The living body will be invaded at its orifices or in its wounds by numerous insect larvae causing various pathologic conditions. This invasion is commonly accidental, other animals being the usual hosts. Occasionally, eggs of insects which normally are attracted to dead matter will be deposited on or within the living body.

Larvae attacking the living body have been listed elsewhere.⁵ Larvae attacking the dead body are:⁶

a. Fresh corpse flies—green bottle fly (*Lucilia caesar*) and sheep maggot fly (*Lucilia sericata*) which may invade living tissue. The common house-fly (*Musca domestica*) deposits its eggs usually on manure. Oviposition on dead bodies is rare.

b. Early putrefaction—blue bottle fly (*Calliphora erythrocephala*). Eggs are readily deposited on fresh meat or bodies, less commonly on decaying material.

c. Late putrefaction larvae are immaterial to the present discussion.

The life history of the early putrefactive insects is as follows:

STAGE	TIME (outside limits) for:	
	Housefly	Green bottle fly Blue bottle fly Sheep maggot fly
Egg	8-12 hours	8-14 hours
1st larval stage (instar)	36 hours	8-14 hours
2nd larval stage (instar)	1-2 days	2-3 days
3rd larval stage (instar)	3-4 days	6-8 days
Pupa	7 days	12 days

ERYTHEMA AS AN INDICATOR OF CERTAIN TYPES OF CHEMICAL ABORTEFACIENTS

A certain group of cases of induced abortion, three in number, has shown a remarkable, heavy, brilliant, reddish-copper appearance or coloration of the skin of the entire body that was not transitory in character and was accompanied by reddish-colored sweat, tears, and urine.

Report of Cases: Case 1. A white, married woman, 32 years of age, visited a female river-bottom "witch-doctor" for termination of her 2 month, third pregnancy. A dark-brown liquid and powders were given, to be taken in repeated doses. About 14 hours later there was an elevation of temperature, cramping, sense of profound weakness, sweating, and a brilliant red coloration of the body. On admission to the hospital the patient remained for a considerable time alert, voiding bright red urine, sweating copiously a red perspiration that stained sheets and pillows. Pulse was rapid and blood pressure quite depressed. Sclerae were red colored. This color was a brilliant, vivid red with a coppery hue that distinguished it from carmine, and which did not disappear with pressure. There was occasional vomiting and light diarrhoea. Coma later developed with a few mild convulsions. Death occurred about 30 hours after the initial medication. No autopsy was permitted, being refused by the coroner who was satisfied with the statement of self-administration of an unknown substance to induce an abortion. The exact agent was not learned but ergot or an ergot derivative with quinine was suspected.

Case 2. (I am deeply indebted to Dr. James G. Christopher for this case.) The patient was a blond, white female, unmarried, age 27, who thought she was pregnant because her menses were 9 days late. Over a period of 7 hours she took 30 capsules of ergapiol (a combination of ergot and apiol) which she purchased at the corner drugstore. About 18 hours after the first dose she became comatose and her color, including that of the nails, sclerae and hair, became a red-brown-copper color. The sweat also had a similar color as well as all secretions and excretions. She bled from all orifices but the loss of blood was small in amount. She died about 36 hours after the first dose. Autopsy revealed diffuse hemorrhages in all the tissues and organs of the body. The internal organs had the consistency and color of deep red currant jelly and were markedly hemorrhagic, soft and friable. The microscopic picture was that of diffuse hemorrhagic necrosis with rupture of arterioles and marked necrosis of their walls. She was not pregnant.

Case 3. This case occurred in the same community as Case 1. The patient was white, married, age 18. She received and took a dark brown fluid and powder to terminate her two month pregnancy. Her entire history, clinical picture and termination duplicate those of Case 1. Once again, autopsy was not permitted, the abortifacient was not identified, and the distributor of the harmful agents was not discovered.

The identity of the agents used in Cases 1 and 3 is difficult, but the close resemblance to Case 2 would indicate a close similarity chemically and in mode of action. We must accept for their identification, three conditions in common:

- a. A drug or drugs or agents commonly considered as capable of producing abortions.
- b. They are capable of producing hemolysis.
- c. They are capable of profoundly affecting the vascular system with vascular damage, dilatation and permeation.

In general, excluding mechanical or instrumental means of abortion, termination of a pregnancy may occasionally be effected by:

- a. Preparations of some forms of ergot.
- b. Pituitary preparations.
- c. Quinine which raises the threshold of irritability of the uterine muscle, plus the use of—
- d. A drastic cathartic.

Adair⁷ doubts that abortion of a normal embryo with a normal decidua in a normal woman can be effected by medicinal means. It is true, however, that large doses of various agents will cause fetal death with resulting abortion, often with disastrous results to the user.

A. Chemical agents^{8,9} taken by mouth and used to induce abortion are grouped as:

- a. Metals—arsenic, antimony, mercury, lead (especially oleate of lead).
- b. Non-metals—phosphorus as rat paste or match heads, chlorates, nitrates (see item No. 1, this paper).
- c. Essential oils, etc.—tansy, savin, colocynth, cantharides, rue, pennyroyal, juniper which is generally ineffective in moderate doses and only toxic acting, thuja, turpentine, nitro-benzol, kerosene, apiol, wintergreen, oil of nutmeg, all generally used because of general smooth muscle irritative effect and a reputed ecboic effect.
- d. Drastics and purgatives—croton oil, betel nut oil, castor oil, and aloes.
- e. Vegetable extracts—toxus, cotton root bark, black hellebore, white hellebore, and laburnum.

Most of the substances in the last three groups produce a profound engorgement of the mucous membrane of the uterus, together with a

severe gastro-enteritis, and inflammation of the kidney and bladder. Users of these substances often die before an abortion can be effected. Many also will cause hemolysis with hemoglobinuria and methemoglobinemia.

f. Alkaloids—ergot and derivatives, quinine, strychnine, and picrotoxin. Quinine may produce uterine contractions but in effective doses is highly toxic and will produce hemolysis, methemoglobinemia, and hemoglobinuria. Ergot produces vascular and neurologic effects, vomiting, convulsions, collapse, sometimes hemolysis.

B. Abortions by introduction of chemicals into the uterus. Arsenic, silver salts, mercury salts, phosphorus (match sticks), potassium permanganate, strong salt solutions, formaldehyde, glycerine 100%, soap solutions, iodine, uterine abortion pastes, castor oil, etc., introduced for (1) their chemical effect on the uterus; (2) killing chemical effect on the embryo and sac; (3) mechanical separation of the product of pregnancy from the uterine lining.

Certain chemicals, especially liquid solutions, may be introduced into dilated, open vascular sinuses of the pregnant uterine wall resulting in hemolysis and later death. Death at times may be abrupt, especially if due to air embolism.

It is felt that the present series represents an erythemia and hemolysis due to ergot or a derivative of ergot, together with an essential oil such as apiol, or wintergreen; and probably quinine in addition in Cases 1 and 3.

ORGANISMS IN THE CAPILLARIES OF THE FETAL PLACENTAL VILLI AS POSITIVE EVIDENCE OF CRIMINAL ABORTION

Repeated observation under the microscope of microsections of chorio-amicotic tissues in known cases of induced abortion has shown the occasional appearance of clumps of micro-organisms within the capillaries of the fetal villi. At these or other points in the examined tissues, there would be acute inflammatory foci. Capillaries of course appear within the fetal villi about the 6th week of pregnancy. Micro-organisms will not appear within the uterine cavity before loss of the cervical pregnancy mucous plug or before dilatation of the cervix and uterus. In spontaneous abortion these occur on termination of the life of the embryo, not before, and the attachment of micro-organisms to the products of pregnancy will be superficial, slowly permeating, depending on the motility of the micro-organism and duration of the retention of the product of pregnancy. This will be at a time when the circulation

of the embryo and its sac, as a phenomenon of life, will have ceased and the micro-organisms, if not motile, will not be found in the fetal villi, free and distant of surrounding growing bacterial masses outside the villi.

On the other hand, if the cervix and the uterine cavities are penetrated in the process of mechanical induction of abortion, organisms may be carried into the uterus and into the wounded tissues of the membranes or the embryo. If the embryo and membranes are not immediately evacuated, as in simple servical dilatation, vaginal packing, the use of slippery elm or laminaria tent, or in a poorly performed curettage, then the life of the embryo may be maintained sufficiently long to allow micro-organisms, introduced through the wounded fetal membranes, to be transported throughout the entire fetal circulation as an antemortem bacteremia. This transportation of non-motile organisms should be accepted as indicative of entry during fetal life, occurring from extraneous introduction via a mechanically opened cervix and uterus.

These micro-organisms¹⁰ encountered in puerperal infection are almost invariably of exogenous origin, introduced from the patient's own vulva or vagina, or by instruments or an operator's hands. They usually consist of a streptococcus of Lancefield A type, staphylococcus, *E. coli*, *N. gonococcus*, *D. pneumoniae*, *C. diphtheria*, or *Cl. aerogenes capsulatus* (*Cl. welchii*). The most frequent organisms are streptococci occurring in over 75% of cases of septic abortion, as hemolytic and non-hemolytic, aerobic and non-aerobic forms, according to Schottmuller¹¹ and later Schwartz and Dieckman.¹² Whitridge Williams¹³ has shown between 1/3 and 1/2 of these cases are due to streptococci, most of which are culturally reported as sterile unless purposefully sought for by anaerobic culture techniques. When these streptococci are demonstrated microscopically in micro-sections, appearing bounded by the capillary walls of the villi and without adjacent surrounding organisms, some explanation must be given. I believe it is due to the introduction of organisms by mechanical means into the fetal structure before its death, that the fetus dies before the cervix is opened in accidental abortion and that in the latter case, non-motile organisms will not be introduced into nor spread through the inactive or dead fetal circulatory system. It is noted that similar observations and conclusions have been made by Wohlwill and Bock.^{14, 15, 16}

The medicolegal implications and limitations of these observations, and the conclusions derived, are fully realized. In the living patient, they rarely will be admitted in court. As autopsy material, just as in

puerperal endometritis or sepsis, it will demand the absolute rigid exclusion of any source or focus of possible primary pre-abortional localization of the incriminated organism in any other part or organ of the victim.

SUMMARY

1. Certain German smokeless gunpowders are used as abortefacients, the principal active ingredients being nitrate compounds, possibly diphenylamine and pentaerythritol tetranitrate (PETN), diethyleneglycol dinitrate (DEGN), and certain complex compounds of urea.

2. A case of infestation of the uterine cavity by house-fly larvae is reported, the eggs of the insect being introduced by a contaminated barnyard instrument used to effect an abortion. This uterine myiasis is presented as an indication of induced abortion, and affords data as to the approximate time of abortion.

3. A deep copper red erythema or skin coloration with red sweat, is presented as an indication of the use of certain abortefacients consisting principally of ergot or its derivatives, with or without quinine and certain purgatives.

4. The observation of non-motile bacteria in the micro-sections of fetal villi is presented as evidence of mechanically induced abortion.

REFERENCES

1. Licker, R. (M.D., A.U.S.), personal communication.
2. Derome, W., *Expertise en Armes a Feu*. Montreal, 1929, p. 137.
3. Western Cartridge Co., East Alton, Ill.: personal communication.
4. Western Cartridge Co., East Alton, Ill.: personal communication.
5. Ransom, B. H., "The Metazoan Parasites of Man," Nelson Loose-Leaf Medicine, Thomas Nelson & Sons, New York, 1947, vol. 2, pp. 391-393, 420, 424, 429, 431-432.
6. Glaister, J., *Medical Jurisprudence and Toxicology*, ed. 7, Williams and Wilkins Company, Baltimore, 1942, p. 129.
7. Adair, F. L., *Obstetrics and Gynecology*, ed. 1, Lea & Febiger, Inc., Philadelphia, 1940, pp. 652-655.
8. Gonzales, T. A., Vance, M., Helpert, M. and Maitland, H. S., *Legal Medicine and Toxicology*, Appleton-Century Company, Inc., New York, 1940, p. 329.
9. Glaister, J., *Medical Jurisprudence and Toxicology*, ed. 7, Williams and Wilkins Company, Baltimore, 1942, p. 314.
10. Matthews, H. B., In: Nelson Loose-Leaf Surgery, vol. 7, Thomas Nelson & Sons, New York, 1942, pp. 15-52.
11. Schottmuller, H., *Mitt. a. d. Grenzgeb. d. Med. u. Chir.* 21:450, 1910.
12. Schwartz, O. H. and Dieckman, W. J., *American J. Obst. & Gynec.* 13:467, 1927.
13. Williams, J. W., *Bull. New York Acad. Med.* 7:260, 1931.
14. Wohlwill, F. and Bock, H. E., *Arch. f. Gynäk.* 135:271-319, 1928.
15. *Ibid.*, *Verhand. d. Deut. Path. Gesell.* April, pp. 151-155, 1930.
16. Wohlwill, F., *Verhand. d. Deut. Path. Gesell.* April, pp. 531-532, 1928.