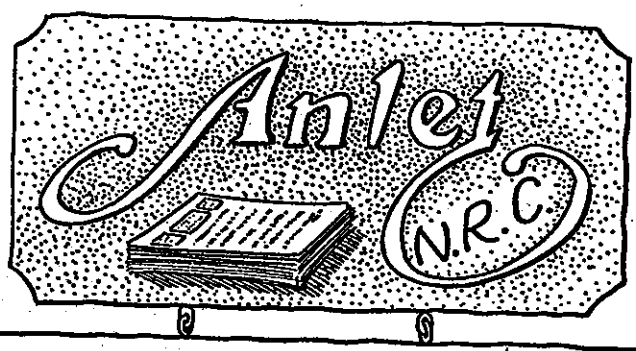

EXCERPTS OF LETTERS FROM ANESTHESIOLOGISTS

— EDITOR — JOHN S. LUNDY —

Volume I. June 1, 1943 Number 1.

This publication is an experimental newsletter. It is begun at the request of the Subcommittee on Anesthesia, of the Committee on Surgery, of the National Research Council. Its name is a contraction of the words "anesthesia letters." Its purpose is to assemble excerpts of letters from anesthesiologists, especially those who are in military service, and to distribute them primarily to anesthesiologists who are engaged in military educational work.

Anlet is facing its first readers without an editorial board or official financial support. For the time being at least, the editor is assuming these responsibilities. If the publication proves to meet the needs or the desires of those for whom it is intended, doubtless it can assume a more formal character, both editorial and fiscal. In the meantime, the editor will welcome suggestions and, above all, copy, in the form of letters from anesthesiologists.

Australia: November 6, 1942 (received December 24, 1942).

"Our duties in the past 5 months have been pure garrison ones, looking after the well being of inactive troops. Surgery is confined to hernias, hemorrhoids, appendices and cartilages of the knee — a very

dull assortment of that -- about 40 or 50 cases a month at most. An occasional 'gas' is indicated because of respiratory disease; an occasional pentothal, but mostly just 'open ether'.".

Australia: (Received October 12, 1942).

"Gradually, I was able to obtain a little pentothal and finally a portable machine (McKesson) with some oxygen and nitrous oxide. What little pentothal I was able to get I used sparingly, even going so far as to save unused portions and using a sterile cap on a syringe for that purpose. I was able to use pentothal that was up to a week old with good results. The syringes did get sticky and I found that immersing it in a little hot water for about 15-30 seconds did the trick. Toward the end of my stay there pentothal was more readily available, thank God -- I found it one of the most ideal agents for field use. If given the choice of what to carry I'd take pentothal rather than ether. I also found, because of climatic conditions, open drop ether not very often the anesthetic of choice, local and regional blocks, metatarsal, metacarpal, radial, ulnar, brachial and sacro-caudals proved of definite value and as group perhaps occupied about 50 percent of all the work with spinals about 15-20 percent, intravenous pentothal about 10 percent (wish it could have been more) and the balance distributed amongst gas-oxygen, gas-oxygen-ether, drop ether, ethyl chloride spray as well as inhalation. For a time, disappointed at the lack of pentothal, no machine available and disgusted with open drop ether, for two reasons (climatic and patient's alcoholism) I began playing around with intravenous ether (in 5 percent glucose). I didn't do enough cases to come to any definite conclusions as yet but I intend to do some more work along those lines when the opportunity presents itself. I might tell you of one interesting case I had -- a boy with acute appendicitis, on board a ship along the coast, was prepared for operation. Only drop ether was available. The medical officer started the anesthetic and after 1½ hours had used six ½ lb. tins with only moderate analgesia present. By that time they had gotten only as far as peritoneum and he was as rigid as a board. They stopped and put him ashore. He got to our hospital shortly thereafter. With the above history I decided to use spinal novocaine (crystals). It was a very simple tap to do and I used 150 mgm.-L_2-L_3- with 3 cc. of spinal fluid. We waited up to ½ hr. with no more effect than skin hyperesthesia as far up as the umbilicus. His abdomen remained rigid. Under intravenous pentothal he then relaxed and the operation proceeded without further complications. In all I used approximately 1500 mgm. of pentothal."

England: January 2, 1943 (received 2-7-43).

"I went to Ewell to see Dr. M.O.Nosworthy. He does quite a lot of chest anesthesia. We had a long discussion on blast injuries. It is very difficult to make a diagnosis of blast injury, because of the inadequacy of the history and the fact that the physical findings are not at all reliable. They neither indicate the character nor extent of the lung damage. The men here felt that rather than wait to determine if one is dealing with a case of blast injury, as they did formerly, it is better to go ahead and do whatever surgery is indicated.

"They recognize a condition which they call 'lung concussion' which occurs with damage to the lungs. It is manifested by paralysis of the motor nerves of respiration with a resultant splinting of the thoracic cage, which gives rise to rather severe dyspnea. In these cases it may be necessary to intubate the patient promptly, blindly if need be.

"In cases of open pneumothorax it is imperative to get control of the respiration immediately because of the untoward effects of mediastinal flutter and paradoxical respiration. This can be done by endotracheal intubation and controlled respiration.

"The type of anesthesia used depends on the patient's condition. Cyclopropane, with or without a tube, is used most often. Pentothal induction is advised because of its quiet and speedy induction, which is of value in these cases. Saw Dr. Organe at the Westminster Hospital the next day. He did a very nice block for a common duct exploration. He performed an intercostal block 6-12 on the right and9-12 on the left. He used a point about 5 cm. from the spinous processes. The patient was on his left side. He did not raise skin wheals, and kept his syringe attached to the needle. The solution used was 1:2000 nupercaine and 0.25 percent procaine plus a vasoconstrictor. He also did a right splanchnic block. The relaxation was perfect and discomfort controlled with intravenous morphia, in rather large doses.

"Next day I saw Dr. Davies at East Grinstead. He demonstrated the technique of anesthesia on plastic cases. They use cyclopropane with a nasal endotracheal tube. He always uses a pentothal induction. Their method of administering pentothal over here is somewhat different from ours. They use the single shot technique, giving 0.5 gm. in about 40 seconds. They use a small gage needle which they say limits the rate of injection and permits one to observe the patient without worrying about dislodging the needle.'

"They use anesthetic ointments on the tubes and airways and always spray the nose and throat before intubation. This was true of all the places visited. Went to Oxford for several days and observed their methods.

"In general the anesthetic procedures are well carried out over here. They do not seem to watch their patients as closely as we do, and their charts are conspicuously absent. Pentothal is given in the single dose, in 5 percent solutions. Did not see any long cases carried under pentothal although they do use it. Their machines have many more gadgets and do-dads on it than ours do."

[illegible] January 2, 1943 (Received January 27, 1943).

"When I arrived, hospitals lacked intratracheal equipment, carbon dioxide absorbers and cyclopropane. I have now had intratracheal anesthesia accepted in principle, and the equipment is available for distribution. Carbon dioxide absorption has also been accepted as desirable, and I am at the present time investigating the possibilities of obtaining the necessary equipment. I have hopes of obtaining at least a limited number of circuit absorbers and approximately twice as many of the to and fro type. The principle of using cyclopropane in surgical procedures involving the thorax has been accepted and I have trained and experienced anesthetists who are located in hospitals adequately equipped to administer the gas is in limited supply, and I shall very definitely limit those who may use it. I am in the process of preparing a Manual on Anesthesia suitable for use in this theater. I have the regional part completed and hope to finish the remainder soon. I have visited every military hospital in operation on this island. Have inspected the equipment, evaluated the capabilities of the anesthetists. I have also given approximately 20 men on detached service for instruction in anesthesia. In this matter the British anesthetists have co-operated 100

"An official anesthetic record has been developed and will be immediately available. This form includes a graph for the recording of blood pressures. A larger and more complete record has been designed and accepted for General Hospitals. I am at present working on a punch card system, which will be standard for both Canadian and American Armies in this theater, with Canadian officers. This effort, if successfully carried through clinically, will make available to me a statistical record of the specialty's activities."

South Pacific: February 2, 1943.

"I am now in the South Pacific. I am chief of the operating room and anesthesia. I am to have charge of all infusions and transfusions for the surgical service and hope eventually to take over the same work for the medical service. I find there are many things to be done in setting up an operating room and anesthesia service that I formerly took for granted or never even thought about."

Somewhere in North Africa: February 25,1943 (Received March 15,1943).

"Pentothal sodium remains the most used single anesthetic agent in my department. One learns by experience -- and methods become simpler. It is impractical for us to use a 2.5 percent solution of pentothal for several reasons:(1) We have only a few 30 cc. syringes (no 20 cc.) and we have to use 10 cc. syringes. Assistance is limited, and 2.5 percent solution in 10 cc. syringes would involve much changing. (2) We frequently have to rely upon trained enlisted men or nurses to mix our solutions. The 'routine' I have put in effect for the mixing of pentothal lessens the chance of error. This is the simple procedure of mixing 2 gms. of pentothal in one ampule of sterile water -- one of those '50 cc.' ampules which comes with the pentothal. Each one of those ampules contains around 53 cc. of sterile distilled water which makes only slightly less than a 4 percent solution. Besides being simple it also has the added advantage of saving one ampule of sterile water out of every 2 boxes. This water we use for our solutions of procaine. When I get a patient who has had adequate premedication, I use a 2.5 percent solution which I mix myself -- or have my regular nurse assistant mix. (3) It is now impractical for us to mix up pentothal in advance. (4) Sterile supplies are limited and we do not open any more syringes than actually necessary. On one occasion I ran 3 pentothal tables and one ether (open drop) table simultaneously -- using 2 nurses and 2 enlisted men as 'robots' to do as I told them. I induced all 4 patients. As yet, I have had no anesthetic complications. Shock has been a much more prominent factor since I wrote you last. The dried plasma has been life-saving in many instances -- however, on some cases we have used whole blood. Two cases, which demanded immediate surgery, I thought to be in irreversible shock are alive today, to the best of my knowledge. Both were suffering from acute hemorrhage: (1) Transverse colon slit open for 3"; 8 perforations of small bowel; 4 perforations of descending colon. Blood supply to transverse colon was destroyed and resection was done. He was in profound shock and bleeding profusely. During operation he was given plasma and blood. Anesthesia: drop ether -- 3 oz. Uneventful recovery. (2) Profunda femoris artery and vein shot out in upper 1/3 left thigh. Great loss of blood and profound shock. Bleeding profusely. Vessels ligated and tied. Plasma and whole blood. O_2 continuously. Anesthesia: pentothal sodium -- 1 gm. Uneventful recovery.

"I should think that an unbreakable transparent plastic syringe, such as you suggest, would be welcomed by military and civilian hospitals. Hope you get somewhere with it."

North Africa: February 8, 1943 (Received March 1,1943).

"We are attached to a British General Hospital. We are quite busy in surgery, as we are getting all the boys from the front back here. They are receiving good treatment near the front, so are coming back to us in good condition.

"These British anesthetists give 5 percent sodium pentothal. They inject 1 gm. very rapidly and then go ahead and use nitrous oxide, oxygen and ether. It really scares us to see them use it. But so far we haven't seen any bad results from its use like this."

Somewhere in New Guinea: February 9, 1943.

"For a period, while the bitter business in hand at the time was in full swing, we were so busy that we hardly had time to eat or sleep. But now that that particular period is over, we can sit back and, in analyzing our work, come to the possibly immodest conclusion that we did do a beautiful job. This is particularly gratifying, in view of the long period of relative inactivity that we endured while back on the mainland.

"Experience in anesthesia has been rich, full and enormously interesting. Pentothal has proven of great value, since so many of our cases (debridements, fractures, painful dressings, burns, etc.) are very well suited for its use. For a while, we had a bit of difficulty in obtaining an adequate supply, but that didn't bother us too much; by using a more dilute solution and capitalizing on the morphine-pentothal synergism, I managed to stretch the available supply to the sticking point. In this, and other general respects, war anesthesia is greatly valuable, if for naught else, for the ingenuity in improvisation that it demands and instills.

"The only time I use the machine is in those chest cases that require positive pressure during the surgery. Regional technic, as may be expected, is seldom employed."

England: V-mail, March 10, 1943 (Received March 15,1943).

"Have activated a combined depot and laboratory for checking issue and maintenance of equipment. Lack of standardization in America and with the British is a pain. Suggest adapting all gas machines to be standard with outlet and inlet and buying rubber tubes, masks and intratracheal adapters all from one company. Would like to see all companies forced to sell the Government large size yoke outfits such as they were accustomed to supply the British market, making possible use of either standard American tanks or British type, without use of adapters."

[illegible]ca: February 28,1943 (Received March 22,1943).

"I can at least quote slightly from practical experiences in [illegible]thesia in the field -- and I do mean field. After my return to Camp [illegible]rt I was shortly transferred to the Second Auxiliary Surgical Group. [illegible]e not further subdivided, leaving 'we' one orthopedic team, and one [illegible]al surgical team, each with a surgeon, assistant and anesthetist, [illegible]een attached to clearing station platoons -- the first place be-[illegible]he lines where any definitive surgery of any kind has ever been [illegible]ted. Our surgery is a tent, our operating table a litter set [illegible]-ended chests. We have a generator furnishing light from a

single 200 watt bulb over each of 2 tables. Our sterilizing equipment is a kerosene autoclave and an alcohol burner under a small metal sterilizer. We have no suction, no gas machine, no oxygen. The anesthetics available are local, pentothal sodium, ether and spinal.

"We have given about 80 percent of our cases pentothal sodium, approximately 19 percent local or nerve block and only 1 percent of ether and spinal. We have used pentothal in a great variety of cases. Captain ____ plated a fractured femur under 2500 mgm. The greatest amount was 2750 mgm. for debridement of extensive wounds of the back on an Italian prisoner who was very apprehensive and on whom premedication was unknown. We have put pentothal into the rubber tubing of plasma unit being used to combat shock on a number of occasions without apparent increase in shock. In fact the cases to date have all left the surgery in better condition than when they came in. Whether that is in spite of our anesthetic habits is, of course, open to question. My last case violated all known contraindications, I do believe. We had an Arab child, approximately 8-10 years, who had been hit by a stray bullet nearbyour area and brought in for treatment. The bullet had penetrated the left thigh anteriorly and severed the femoral vessels -- in toto. Hemorrhage was most profuse and shock was present before the leg was even prepared for surgery. One unit of plasma (250 cc.) was run into a vein and then 5 percent glucose just to keep our needle in place. By this time a temporal pulse was felt -- so rather than go through an excitement stage with ether and restarting hemorrhage we slipped a little pentothal into the rubber tubing -- used ½ gm. for about 20 minutes surgery and finished up with the lad in fair condition. I can truthfully state I was treading on dangerous ground -- but one is so often out here that it gets to be a habit -- even though a bad one.

"We have gone into the belly only twice to date. One -- a perforating bullet wound under ether, the other a red hot appendix which came in during a quiet period -- and who the surgeon did not feel could stand the four hour trip back to the nearest surgical hospital unit. We were having a near tornado at the time (the surgical tent had to be tied to 3 ambulances later in the evening) and the temperature was near freezing. One wood stove in one end of the tent failed to warm the operating area enough to prevent seeing one's breath on expiration. However, we went ahead -- under spinal novocaine and got out in about 20 minutes. The case had no bad reaction -- temperature was normal on second postoperative day and recovery uneventful."

United States: September 1,1943.

"We have a problem at this Camp and I am having difficulty in selecting the proper anesthetic for this type of problem. It seems that we have had a great number of cases of Ludwig's infections of the neck following extractions of teeth, done either in the field or at the Dental Clinics. Some usually have a great deal of induration or swelling of the neck. Very often there is already some difficulty in breathing due to edema of the trachea and larynx. When there appears to be no leeway, I use 1/8 gr. of morphine intravenously plus a very small amount of 2.5 percent sodium pentothal, just enough so that the surgeon can do his work and not enough to completely relax the patient. I use nasal tube plus oxygen when I use pentothal in these cases. It is possible, however, to always use sodium pentothal and besides, I am a little leery of using it in these cases and because of the infection.

I cannot use a local type of anesthetic."

United States: October 6, 1942.

"With regards to the anesthesia work, I am doing the greater part of it. Our chief method is spinal, using the novocaine crystals. Our operative procedures include hernia repairs, appendectomies, with an occasional cholecystectomy. For all rectal operations I am using the sacral blocks. All of the simple fractures are reduced by means of local infiltration of the fracture site. I have used pentothal sodium for a number of minor surgical procedures, but 2 or more times a week it is used for dental extractions. In one case of a mandibular wiring, the patient developed laryngeal spasm. The operation was then postponed and the following day, with proper premedication, the anesthetic was administered without difficulty.

"My equipment consists of the regular 10 cc. syringe and an assortment of needles. Only two weeks ago our new anesthetic machine arrived. It is a McKesson with Nargraf head and CO_2 absorber. To further complicate the matter, we are not able to obtain gases in the small cylinders, so it was necessary to adapt to the large tanks, which cuts down the mobility of the apparatus.

"Jumping back to the spinal anesthetics, it had not been uncommon that 200 mg. be used for a simple hernia repair. Up to date I have had very few reactions, i.e., nausea, and those were treated with O_2. The blood pressure is observed frequently by the corps men and the ephedrine sulphate is repeated if indicated. I feel that I have been getting anesthetics of longer duration by using the crystals than we obtained when we used the 10 percent solution. I am using the solution in 3 and sometimes 4 percent strength. I have established orders that following spinal punctures, the patient has no pillow for 24 hours, is allowed a pillow the following 24 hours, and the third day may be elevated in his bed. Since that order has been in effect, we have had no postoperative headaches. So far there has been only one spinal injection that was not effective, and the hernia repair was done under local infiltration.

"Our upper abdominal work has been very light as I have not had the opportunity of using any abdominal blocks. We have had a number of accidental traumatic amputations of fingers by gun shot; also industrial accidents and repairs done by field blocks. Have had no opportunities for extensive blocks."

United States: October 5, 1942.

"I am on surgery in charge of two forty-bed wards. I am in charge of anesthesia and blood transfusion. All of your equipment has been ordered, but only the laryngoscope has arrived. I have two assistant surgeons, three internes, one nurse anesthetist and two pharmacist mates to teach anesthesia to. The chief surgeon here uses pontocaine for all surgery below the diaphragm and never more than 15 mg. (1½ cc.) diluted with spinal fluid to 2 cc. He claims that he has been using it for years without catastrophe and so far I have not seen any ill effects. For upper abdominal surgery, he uses between 12 dorsal and lumbar 1. Ephedrine is not used. Morphine is given in 10 minim doses.

"I have done some sacral blocks, goiter blocks, abdominal and lumbar sympathetic blocks. The 'chief' thinks you trained with them. The sailors that are afloat in life boats for days

acquire a painful ulcerative condition of the lower extremities which we call immersion feet. I have tried lumbar sympathetic block on these and it evidently works fairly good. We use plenty of pentothal -- probably too much. We have a new Lundy-Heidbrink gas machine, but I haven't seen it used as yet.

"The blood and plasma bank I started is still in its embryonic stage. We try to keep 2 bottles of "O" blood and 4-5 units of plasma in the frigidaire at all times. We have many severe burn cases from the Navy yard and arsenal."

United States: October 10, 1942.

"In our 1000 bed hospital there is no separate and distinct section of anesthesia. During my sojourn I gave 4 abdominal blocks, many spinals, many varicose veins blocks and many caudals. Also I gave 2 supra-scapular blocks, one on my father, both patients have been free of pain since."

United States: December 9, 1942.

"The equipment which we have is excellent and we try to use what we have and order as little extra as possible, since it is so hard to get even the commonest items during these times and so many people are in real need of them.

"I miss the opportunity to do local work most of all. I have given an endotracheal cyclopropane anesthetic for a lobectomy, [illegible] several other chest cases, and given a great deal of gas, ether, spinal, and pentothal. The intravenous technic I learned from you has been invaluable."

[illegible]ed States: January 7,1943.

"The equipment for anesthesia at the hospital I just left was rather meager, consisting of a Heidbrink machine, few ampules of pentothal sodium and novocaine crystals. I suggested the requisition of endotracheal tubes and a laryngoscope but it was not taken. In view of the somewhat limited surgery consisting mainly of appendectomies, circumcisions, hemorrhoidectomies, and ligations of veins, I suppose the equipment was sufficient. I also tried to introduce sacral [illegible] anesthesia but was limited by lack of proper equipment and by the fact that as in most Army hospitals, the Anesthesia department is overseen by and directed by the department of surgery. At this particular hospital the Surgeon in Chief who had just left was keen on spinal anesthesias and consequently the majority of cases were done under spinal. His successor as Chief carried on the dictates of his predecessor.

"Generally novocain was the choice of anesthesia and occasionally [illegible]ocain was used both with novocain and with glucose. To carry [illegible] tap there was only a five or ten cc. syringe with a hypodermic needle and a much used spinal needle. The Hull time anesthetist was [illegible] to use ephedrine at the time of the tap and he generally did [illegible] any other vasoconstrictor. The outstanding postoperative complication was a severe headache, which was rather frequent."

[illegible] January 25, 1943.

"[illegible] have set up an oxygen therapy department with several [illegible] hand 24 hours a day to keep the equipment in shape and do [illegible] analyses, etc."

United States: February 2, 1943.

"Our work consists mostly of spinals, which the surgeons wish in most cases of hemorrhoids, hernia and appendices, and also in some of the orthopedic work. We give some pentothal, and some few gas inhalations to supplement spinal, and for OB cases.

"The surgeons as yet are averse to trying anything new to them, such as caudal and transsacral or even much infiltration. I am using your spinal technic as closely as possible, with the exception of the fact that procaine crystals are supplied here and also that some of the orthopedic men like a small dose of nupercaine added. I have already run into 2 or 3 problems which I was able to handle nicely, such as lack of preparatory morphine in a pentothal anesthetic and a 50 point systolic drop in another case."

United States: February 19,1943.

"We are still working up this last bunch of casualties and we have our hands full for the time being. A lot of interesting situations to handle -- malaria, dysentery and many nerve injuries plus the usual run of fractures and non-union. The boys all want that stuff that you shoot in the 'main line' as they call it. Pentothal is the pass word as far as I can see when they get hit -- and they are using it by the barrel."

United States: March 11,1943.

"Over a period of three months I have given 155 anesthetics (128 of which have been spinals) here. In addition to this I have been helping to teach the nurses to give drop ether and gas ether anesthetics."

England: January 19,1943.

"The plastic work was done with two patients in the same room with one anesthetist. All the intratracheals were done blind ... A great deal of intravenous morphine is given up to $\frac{0}{4}$ of a grain to get good narcosis preliminary to anesthesia and for pain also. The routine at the hospital where I was is one hour before -$\frac{1}{4}$ M.S., 1/150 atropine, 1/150 scopolamine. ... We are being issued a McGill laryngoscope and a set of McGill tubes with angle pieces. I think we will have Luer Lok syringes. The English use Labat syringes."

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"General anaesthesia is recommended for all but small burns, but it should not be commenced before shock has been overcome. Even at later periods, when shock is not clinically obvious, the anaesthetist should satisfy himself by personal observation and test that the patient is safe for anaesthesia. Should there be any doubt, further transfusions of plasma or blood should be given as required.

"Gas and oxygen is the best anesthetic for burned patients, and pentothal should be avoided, or only used with care by anaesthetists aware of its danger in such cases. The depth of anaesthesia should be minimal, the patient being only just unconscious and awake during the theatre. Its duration should also be reduced as much as possible, and for this reason two or three people should work together on an extensive burn."

EXCERPTS OF LETTERS FROM ANESTHESIOLOGISTS

—— EDITOR —JOHN S. LUNDY ——

Volume I August 1, 1943 Number 1

Editor: John S. Lundy,M.D.

The desirability of publishing periodically a newsletter on problems of anesthesia has been agreed on by most of those concerned. Recently one number was prepared at the request of the Subcommittee on Anesthesia of the Committee on Surgery, in the Division of Medical Sciences of the National Research Council and was issued under the title "Anlet (N.R.C.)." Suggestions were invited. The only objection raised was that the format made the letter seem to be an official publication of the National Research Council. Accordingly, the letters "N.R.C." have been deleted from the title and it is planned to issue subsequent numbers as this one is issued, namely; as a supplement to "Anesthesia Abstracts." The title now is, therefore, "Anlet (A.A.", in which "A.A." stands for "Anesthesia Abstracts." Thus, the publication is in no way official. Nevertheless, nothing is to be included that the editor thinks would not be approved by a censor, military or otherwise.

The Burgess Publishing Company, of Minneapolis, who distribute "Anesthesia Abstracts" have no connection with "Anlet" although the editor of the two is the same person. "Anlet" is published by the Whiting Press, Rochester, Minnesota and is distributed by the editor. This newsletter, then, will become largely a private effort but it continues on a nonprofit basis. It is hoped that those formerly interested will be kind enough to forward to the editor suggestions and criticisms, but, above all letters or excerpts from letters which they feel would be suitable for publication.

Africa: March 12, 1943:

"The agents available for anesthesia are: (1) inhalation -- ether, thyl chloride, and chloroform. (2) Intravenous pentothal sodium, and (3) ocaine hydrochloride -- for infiltration or for spinal use. In our experience, we found ether and pentothal always available in adequate amounts and ed them in 84% of all our cases.

"Technics: we used the simplest -- for, it is not a question of what anesthetist would choose to use, but rather, what is available. With ether, open drop technic was used -- sometimes with ethyl chloride induction other mes with pentothal induction. We have used no chloroform, though we always some along to use in case we should feel the necessity of an inhalation sthetic while operating in a zone where the explosion hazards of open ether uld be too great. In our experience, intravenous pentothal sodium has proved exceptionally useful drug for this type of anesthesia.

"The only available sizes of syringes we had to use for continuous nistration of the intravenous pentothal sodium for anesthesia were 10 cc. 30 cc., with no sizes in between or larger. We chose, therefore, to dilute gram up to 30 cc. with distilled water making a 3.3% solution. There are anesthetists who use only a 2.5% solution and probably equally as a 5% solution. ... We used, satisfactorily, the 3.3% solution in all of our es (in which pentothal was used) and had no untoward results.

"There was but one anesthetist (and no assistant to each case)so it necessary for him to hold the needle and syringe in place and take care of airway, as well as watch the blood pressure, pulse, and general condition he patient. Since it was sometimes necessary to hold the jaw forward it a little awkward to have to hold the syringe constantly. By using a piece mall rubber tubing about 4-6 inches long between the tip of the 30 cc. nge, containing the pentothal sodium solution, and the glass adapter attached he needle in the vein, greater flexibility of the syringe could be made out the needle being displaced out of the vein. We found that if the nge were taped with adhesive to the arm board alongside the outstretched rm that there was a tendency for blood to gravitate back into the syringe. difficulty was overcome by loosely taping the syringe to the volar surface he outstretched forearm, in this manner the syringe was on practically the (or slightly higher), level as the vein and there was less tendency for to gravitate back into the tubing and syringe. Other advantages are: the needle and tubing become contaminated during an anesthetic case and the nge of pentothal empty or partly used can be used without re-sterilization he next case. Then, too, a new syringe of pentothal can easily be put in of the empty one during an anesthesia without disturbing the needle in the . We are not assuming that this crude method of holding the syringe is ing new or has advantages over any other method. We have devised it only he absence of more de luxe methods such as the Rudder, Thomas, B.D., or s.

"The blood pressure cuff was wrapped around above the elbow of the tretched arm compressing the diaphragm of the stethescope over the brachial y so that frequent readings could be taken easily. In this fashion it erved as a tourniquet at the time of the initial venipuncture.

"It is ideal to have oxygen present during the administration of thal sodium for anesthesia, but none was available. Fortunately, no ratory arrest occurred in any of our pentothal sodium anesthesias, but, occurred, we had available a mask and bag which we could have used to ically inflate the lungs with air, and then, too, there is always simple cial respiration that can be resorted to. Without oxygen for administration alation during pentothal anesthesia, we chose to use this agent only on that were in fairly good condition, e.g., those not in shock, those having seeking operations, those not requiring deep anesthesia, or, those having ions of short duration (one hour or less). The quantity of pentothal

...necessary to maintain light anesthesia, (just so the patient wouldn't ..., for an hour or less, usually was around 2.0 grams, in spite of the fact ...every patient had received ½ gr. of morphine tartrate, or more, as soon ...the injury as possible, and before being evacuated to us. The fact that ...injured soldiers required more of the drug to produce anesthesia than an ...dual of equal size and weight in the homeland may partly be explained on ...sis that these patients all were physically husky, young, and strong, and ...ore, more resistant. Then there is a psychic element which must be ...ered, for these men, having been injured in action, have a tendency to ...their battles over again on being anesthetized.

"Records: We left the States in such haste that we brought no ...ic record sheets along so our records were run off on a mimeograph we ...e to use on board ship en route to North Africa. ... Anesthetic records ...h on all cases, and while we regret that postoperative follow up was ...le (because of evacuation within 48 hours), yet we feel that the trouble ...in keeping the records was worthwhile.

"Analysis of cases: the types of cases we had are roughly divided ...n groups:

	Percent
...t injuries, with perforation of pleura	4
...ominal injuries, with perforation of peritoneum	
...bowel	4
...ations	4
...ple shrapnel wounds (minor), with debridement	40
...ures	20
...nations of any of above, with severe shock	16
...ectomies	12

...he agents we used on these cases:

	Percent
...hal sodium intravenously	52
...(open drop)	32
...(procaine hydrochloride)	12
...(procaine hydrochloride)	4

...e depth of anesthesia: (level of 3rd stage)

	Percent
...lane	40
...plane	32
...lane	12
..."lane"	0

...Written March 17,1943; Received April 7, 1943:

...anesthesia setup is very satisfactory and work quite heavy. ...function as a tent hospital. We have been using many anesthetic ...niques, but particularly sodium pentothal. I have certainly ...deal more about this agent while using it here."

...lands: Written March 26, 1943; Received April 20, 1943:

...ve been as busy as I care to be. I have given all types of ...ous-oxide, oxygen and ether, sodium-pentothal and have done ...al blocks on quite a few cases. Our setting is very com- ...getting considerable satisfaction out of the work we are ...y to remain here until this thing is all over."

... Written March 27, 1943:

...k out here continues quite the same. The drive to do as ...sia as possible continues unabated and I am in the initial ...studies that will evaluate the possibility of oxygen therapy ...he treatment of typhus and of malaria. This, I feel, will ...ng study and I am looking forward to the arrival of the

I have devised for the keeping of the necessary records which will furnish actual material. It seems to me that oxygen may be valuable in malaria some degree of anoxia must result from (a) the accompanying anemia the bouts of fever. In typhus, the newly-described vascular lesions undoubtedly result, indirectly, in some degree of myocardial anoxia. Added to are the effects of the usually-concomitant, severe broncho-pneumonia. In eral preliminary cases, oxygen therapy seemed to be of undoubted value; , of course, is not sufficient for a reliable conclusion -- a series of s, with controls if possible, should really give the idea a modicum of stance and 'scientific respectability'."

This sample abstract, taken from Volume XIV of "Anesthesia Abstracts", one of the 3600 abstracts which make up the fifteen volumes published to e:

ffith, H.R., and Johnson,G.E.: The use of curare in general anesthesia. sthesiology. 3:418-420 (July) 1942.

"Every anesthetist has wished at times that he might be able to oduce rapid and complete muscular relaxation in resistant patients under eral anesthesia. This is a preliminary report on the clinical use of a drug ch will give this kind of relaxation, temporarily and apparently quite lessly. The physiological action of curare as an interrupter of the neuro-cular mechanism has long been recognized, and its best known practical lications have been by South American Indians as an arrow poison and in the siological laboratory. The crude curare of the South American forests tains numerous toxic substances, but it has been possible so to refine the g that the elements of cardiac and respiratory depression are removed and y the 'pure' curare effect remains. ...

"In January, 1942, at the suggestion of Dr. L. H. Wright, we began ng Intocostrin (Extract of Unauthenticated Curare, Squibb) in order to increase letal muscular relaxation in patients under general anesthesia. So far, we e given it to 25 patients, and in each case there has been rapid and complete cular relaxation, which develops within one minute after intravenous in-tion of the drug and gradually disappears in from ten to fifteen minutes. none of our patients has there been any serious depressing effect on spiration, pulse or blood pressure, and there was no demonstrable post-erative effect of any kind. Apparently the drug is very rapidly broken down d excreted almost as rapidly as it acts, although there is some evidence from psychiatric experience that patients who are given a second injection on the me day require a smaller dose to produce the physiological effect. We administer e Intocostrin intravenously with a dosage of 10 to 20 mg. of the active curare r 20 lbs. of body weight. Intocostrin is prepared in solution containing mg. of the active curare substance per cubic centimeter, so that an average ult dose is 4 to 5 cc. We have not given to any one patient more than 5 cc., d we make the injection rather rapidly, in less than a minute. It has not en necessary to administer artificial respiration or stimulants in any of our ses. As our patients are all under gas anesthesia, with means of resuscitation oxygen immediately available, we do not fear this complication. Since rostigmine is used as an antidote to curare, an ampule of this drug should lways be available. ... All the patients were under cyclopropane anesthesia, and anged in ages from 18 to 70 years. Since we do not ordinarily have difficulty e to inadequate relaxation during cyclopropane anesthesia, in many of these ses the anesthesia was purposely lightened to the point of abdominal straining n order to test the effect of the curare. ... It seems to us, as the result of ese preliminary clinical investigations, that curare may prove to be a drug ich will occasionally be of great value, and will give us a means of providing e surgeon rapidly with excellent muscular relaxation at critical times during rtain operations. Its scope of usefulness is limited because of its somewhat leeting action, and because it is in no sense an anesthetic agent. It is

otentially a dangerous poison, and should be used only by experienced anes-
hetists in well-equipped operating rooms; but we have been so much impre sed by
he dramatic effect produced in every one of our patients that we believe this
vestigation should be continued."

F. A. McQuillen

ersia: Written April 19, 1943; Received May 12, 1943:

"Our hospital site, located in the mountains, is ideal. At times we
ve been subjected to varying types of weather. Although it is spring now we
ve had snow, rain and a few hot, dusty days. Our work has been moderately
avy. Here in the field I have given many open-drop ethers and a few intra-
nous sodium pentothal anesthetics. While the surgeons and I like ether a great
l, we have no suction machine in the field and therefore have experienced a
complications with mucus. We have done very few spinal and block anesthesias.

frica: Written May 11, 1943; Received May 21, 1943:

"Our equipment is amazingly complete. Our job will be to provide
dical and surgical treatment of prisoners of war. As for anesthesiology
uipment, I am very well satisfied. The Army packs into a small carton all
pplies necessary for endotracheal, regional, spinal and general anesthesia;
t of Magill tubes, hard rubber Foregger-type airways, syringes, spinal
dles...We have ether, a few cases of chloroform and sodium-pentothal and a
sson unit for nitrous-oxide and oxygen. We have a few Tycos blood pressure
nes with long tubing."

frica: Written May 16, 1943; Received June 7, 1943:

"I used mostly open-drop ether. Sometimes I induced with Pentothal.
edication is very heavy. We have prepared ampules of alopan, which is
ivalent to 1/4 gr. morphine-sulphate. I used two of these, one about one
efore operation and the other one intravenously, and still I did not get
factory pre-medication. I suspect the stuff has deteriorated. We have
ovain available and I don't like it, but have to do the best with what
. For suction I use a 50 cc. syringe and catheter. I have not had
ch to use the endotracheal set much, but hope to soon. ... On the whole,
rk is very interesting and instructive."

York:

"Put on an exhibition anesthesia and oxygen therapy. Whittled out a
for a pentothal syringe with a screw arrangement on the back and a
ing tube. Works very well for plaster cases where x-rays etc. conserve
deal of time. ... I showed the quick coupling unit for the multiple
tration of oxygen. ... Pentothal inductions followed by gas are ideal for
obust boys. It saves a rough induction. I usually insert a tube if at
icated after the patient is thoroughly relaxed, and generally through the
Those English tubes are very hard and have a tendency to cause bleeding
ose. McGill uses an ephedrine spray in the nose, nupercain 2% ointment
ube and cocainizes the throat."

a: Written June 13,1943; Received July 8, 1943:

"We have at present 5 anesthetists. ... The hospital has two small
ines, Heidbrink and McKesson, until just recently they were not complete.
ity of anesthesia is spinal, pentothal and lastly general anesthesia.
regional block is very little practiced. ... It is very interesting to
one can improvise when modern conveniences are lacking. I feel the ex-
here will be a great help to me when I'm actually put on my own. ... I
method of localization of interspace has paid dividends. As most of our
extremities we give 150 mg. in 3 cc. in 4 interspace and it lasts
ours. Ephedrine sulfate is scarce and used only in emergency. Intra-
hes are used rarely but in some cases of facial injuries they are a

...er. Pentothal is used here in 2.5 percent strength and is very useful ... hospital as these cases have passed through the severe injury stage ...ly are here for repairs and disposition."

...: Written May 24, 1943; Received June 5, 1943:
..."Using gallons of pentothal up front and the rest ether, very little ...

...York City: Written April 21, 1943; Received May 29, 1943:
..."To my mind, the land mine is the most 'macerating' of weapons; and ...ls coming in contact with them are almost universally in moderate to ...hock. Depending upon the type of mine encountered, the injuries may be ...on the body, but most frequently they involve the lower extremities. ...from the larger guns have no predominate spot on which to inflict their ... We have seen a marked increase in chest, abdominal, and head wounds, ...since we began receiving casualties in this group.
..."We have had several severe face injuries which have constituted anes- ...oblems. (Sides of faces blown off, etc.). These cases necessitated ...eal anesthesia -- and a hook-up of some sort to either the machine or ...r can. Since the connectors I have are Adams connectors, they will ...McKesson tubing. However, with adhesive tape and a little in- ...did get along. Another system was to use a large piece of rubber ...hook it up to a large ether can, the other end of which was attached ...tracheal tube (a la Flagg method). With the assistance of nurses ...d men, I have run as high as six tables -- supervising all of them. ...en there is a case which demands my undivided attention this many ...ot be in operation. Such cases are not infrequent. ... (I do not ...es of face injuries, but 6 tables of all types of cases -- usually ...). Many of the minor injuries are done under local -- field block. ...do regional anesthesia (brachial plexus, etc.). Only a few spinals. ...due to the difficulty we have in obtaining gases (especially oxygen -- ...e is used ONLY for inductions), we do not use our machines except for ...es demanding closed anesthesia with positive pressure; and other ...es. In this way we conserve what oxygen we have. Drop ether is used ...ll abdominal work. Pentothal is still the most used single anes- ... -- and were it not for that, we would never be able to turn out ... of work that we do -- and that is necessary. I feel, now more than ...s use in the presence of shock is definitely indicated whenever ...those cases demanding surgery. (You know, of course, that we do not ...opane).
...asma is still being used to definite advantage; however, more and ...cases are requiring whole blood. The non-combatant units about us ...remely cooperative in furnishing us with donors. In fact, we keep ...ap' to be used when indicated. Since we have no method to store ...t is drawn, we must keep the donors handy. In emergencies we give ...od without waiting for a cross match.
...ere is one case I will tell you about to show you the type of case ...encountering and what we are doing for them. This boy was admitted ...ago due to injuries from a land mine. He had severe injuries in- ...feet, legs, and thighs. (Compound fractures, loss of substance, ...us, etc.). He also had lacerations of the face involving the mouth. ...re shock; had lost a great quantity of blood, and was still bleed- ...soon felt it necessary to do an operative procedure to control the ... pulse was weak, rapid, and thready; and his pre-operative ...was 68/46. After examination I thought him to be in the irreversible ..., but as it turned out, he wasn't. (However, he comes the near- ...y case I have seen to date and not be!) Plasma was started

ediately (until whole blood could be drawn) and I chose pentothal sodium as anesthetic agent. For this case, as in all cases in severe shock, I rted from my usual 4% solution and used a 2.5% solution. Two cc. of this enough to put the patient to sleep. To insure an open airway, and in order give oxygen, I did a blind intubation with a Magill intratracheal tube ough the nostril (the face was to be repaired at the same time as the legs e being worked on). Oxygen was given via the machine with my 'adhesive tape' nectors. Twice during the operations he stopped breathing and coramine was en intravenously and artificial respiration was instituted. The operative cedure was held up on these two occasions. Whole blood was given as soon as was available (from 3 of our sergeants in this case) and he received this oughout the remaining part of the operation. During the 2 hours and 10 utes procedure the patient received 900 mgm. of pentothal. Following operation id not deem it advisable for him to leave the operating room — it was quite d outside and I felt that transportation to a ward by litter would finish him. blood pressure came up to 90/60 during the operation but made sudden falls ing the two times already mentioned. He was treated for shock in the operating m all through the night and was in fair condition the next morning, at which e I allowed him to be transported to the ward. RBC and HBG were taken every ours for 48 hours and came up from 1.1 to 3.8 (RBC). I dont remember the , but since they were Talquist, I can understand why I didn't remember them! ourse, he was given many transfusions during his stay with us, and it was cessary for us to evacuate him on about the 7th postoperative day (RBC 4.2). was in good condition for evacuation.

I am working on a plan for some systematic method of premedication. is very hard to do this with our set-up. We may plan to operate a case in hour, and during that time other cases arrive that need operation much more n the case planned. As a result, few get proper premedication. I use intra- ous morphine in many of my cases. A week or so ago I had a case who had eived MS. gr. ½ (the usual dose) elsewhere and was in marked respiratory pression from it. It was necessary that he undergo surgery (abdominal loration). Closed ether (intratracheal) was given and carbon dioxide allowed accumulate to a point where respirations were improved — but not to the nt of hyperventilation. Intravenous coramine was also given. A perforation the duodenum was found, with a large amount of bile in a peritoneal cavity. recovered from his anesthetic, so that the cough reflex was present before left the operating room. On his second day he developed a patchy atelectasis, ch caused much respiratory embarrassment — this developed in spite of proper ventative orders. This, I felt, was due to two factors: (1) mucous, and respiratory depression due to the MS. Had we had some form of suction, s complication might have been avoided. I have put in a request for it which been in for some time; however, in the meantime two of my sergeants have nvented' a form of suction which I hope will prove to be satisfactory."

w Guinea: Written May 29, 1943:

"We have been in New Guinea for some time. ... We've done less surgery here than one might expect. ... What surgery we have had (except for frequent es of cellulitis requiring simple drainage) has been rather complicated, t is, because of severity of injury or co-existing malaria. We use spinal, ntothal and local (especially brachial blocks) almost exclusively. We have d closed ether-oxygen infrequently; no open-drop, although I do not feel that tropical climate presents any serious obstacles to its use. Our pentothals are equently supplemented by oxygen or nitrous oxide-oxygen. ... Yesterday, I used ntinuous spinal for bilateral plating of bilateral fractured femurs which, I lieve, is the first continuous spinal to be used in New Guinea. I claim only other distinction. Some time ago I gave pentothal to a New Britain native. As for anesthetic complications, there have been very few — an occasional t-spinal headache and one mild atelectasis which recovered in one day. ...

I am sorry some of the men have had trouble with the pentothal supply. ... Our medical supply officer has been so impressed with the importance of this drug that he now automatically keeps a good-sized reserve on hand."

N. Africa: Written May 31, 1943:

"We arrived a little late to treat any war casualties so most of the work in our operating room has been elective surgery as herniorrhaphies, hemorrhoidectomies, hydrocelectomy, and excision of pilonidal cysts. All these cases have been given spinal anesthesia. The apparatus for administering anesthesia is plentiful. We have two sets of portable apparatus (Gwathmey #1) to administer gas, oxygen, ether without carbon dioxide absorption. There is plenty of oxygen, nitrous oxide, procaine for spinal and local, pontocaine for spinal, sodium pentothal and 12 sets of endotracheal apparatus. For administering oxygen we have the Boothby apparatus and apparatus for nasopharyngeal oxygen."

APO New York City: Written June 13, 1943; Received July 8, 1943:

"In the last scene of action we did a great amount of work. ... In one day we did away with 75 grams of pentothal. ... I have had no anesthetic deaths in spite of the poor condition of many of our patients. The only case I have had die on the table was one where the splenic vein was severed by a piece of shrapnel. ... Now that the battle over here is over, we are doing quite a bit of elective work, and I am again doing quite a bit of regional - especially caudal transsacrals. We now can give our patients 'planned premedication'."

United States: April 15, 1943:

"Considering the strain on production, the equipment has been good and adequate. ... I give lots of spinals and when general is needed I give nitrous oxide and ether and so far have gotten along fine. Have used quite a bit of pentothal sodium too, for operations not requiring complete relaxation. In one case we did a thigh amputation with only refrigeration with chipped ice and I want to recommend that method on poor risks as it works beautifully and there is absolutely no shock or discomfort connected with it. Local anesthesia is, of course, used in many minor cases."

United States: May 31, 1943:

They had been using 5 percent pentothal ... but now they use 2.5 percent. They maintained that they couldn't get sailors to sleep with 2.5 percent, but we dont seem to have any trouble. I think it is true that if you give small amounts and then wait, rather than giving large amounts rapidly, you dont have to use so much to keep them asleep. They use a lot of pontocain for spinals. We do caudals and trans-sacral for rectal work routinely. They do all uncomplicated inguinal herniae, pilonidal cysts and plastic work under local. We have two gas machines, one laryngoscope and one tube but there are others on order."

United States: June 30, 1943:

"Yesterday, I gave pentothal for 5 hours and 15 minutes for a sciatic nerve repair. ... We had a severe laryngospasm with pentothal on a nose reconstruction that was not intubated. Tracheotomy was required as a life-saving measure. ... Patient recovered uneventfully. ... Since that time all these cases have been intubated and all has gone well. ... The anesthesia department has also inherited the oxygen therapy service. ... An emergency plasma service is being developed here. ... Have you had any comments in any of your recent letters from the fellows out in the field as to the effect of malaria upon their surgery and anesthesia or vice versa? We have had several patients here who had flare-ups of their malaria following surgery -- severe flare-ups in fact -- do you suppose there is any connection? Recently it has been the policy here to give quinine (or atabrine) preoperatively to patients who are known to have had malaria."

EXCERPTS OF LETTERS FROM ANESTHESIOLOGISTS

—— EDITOR —JOHN S. LUNDY ——

Volume 1 October 1, 1943 Number 2

The first issue of "Anlet, A.A." seems to have been well received and it has been suggested that it be continued. Therefore, this second issue has been prepared with the idea of making available in newsletter form the opinions that have been expressed by anesthetists at near and distant points. So far as possible, the material has been limited to problems facing the anesthetist and how they have been met, either successfully or unsuccessfully. If someone has a solution for any of these problems, or has a better solution than that presented, correspondence is invited so that the best thought may be disseminated.

The word "Anlet," as some readers know, is drawn from the words "anesthesia letters." The abbreviation "A.A." stands for "Anesthesia Abstracts." These newsletters are prepared as supplements to "Anesthesia Abstracts."

As was stated previously, the Burgess Publishing Company, of Minneapolis, who distribute "Anesthesia Abstracts," have no connection with "Anlet" although the editor of the two is the same person. "Anlet" is published by the Whiting Press, Rochester, Minnesota and is distributed by the editor. This newsletter, then, has become largely a private effort but it continues on a nonprofit basis. It is hoped that those formerly interested will be kind enough to forward to the editor suggestions and criticisms but, above all, letters or excerpts from letters which they feel would be suitable for publication.

Tunisia: Written May 18, 1943; received June 2, 1943.

"Heidbrinks are packed in a little hand trunk, but strangely enough, the mask, bag and tubing are not packed with the machine and so the latter has been useless to us... So Major B. took the tubing of a gas mask and inside of a football and the oxygen mask off our large oxygen tank and thereby completed the machine. It works quite well though in a few places where we cannot attach the connection tightly, we have lost gas. However, we can use it in an emergency. Our anesthetics are mostly spinal, intravenous, local, brachial plexus blocks and caudals."

United States: Written May 27, 1943.

"The anesthesias I am giving are mostly of three types--inhalation, intravenous, and spinal, with an occasional block. I tried a brachial block not so long ago without much success, but I would like to get another one. Spinals are used whenever possible for surgery of the lower extremities. It is a pleasure to see these husky men handle a spinal in most cases with little or no fall in pressure. Many of them will tolerate 150 mg. (procaine) in 3 c.c. without any ephedrine and apparently feel no ill effects... Pentothal is quite popular with the surgeons for many orthopedic procedures. In general I use 2.5 per cent solution, but for most of these heavyweights I think the 5 per cent probably works better. The boys like it... Gas and ether by inhalation is used for all major procedures. The surgeons like it and quite a lot of the patients prefer it to spinal."

Tunisia: Written June 3, 1943; received June 25, 1943.

"The work up front was in the main done under Pentothal. The belly cases were inducted under chloroform and maintained under ether. We had no anesthetic machine or gases up here. At the larger hospitals, they have Boyle's machine (quite similar to our Bubble Gwathmey). Most of the cases are very short and frequently I had to run two tables and as a result, Pentothal came in mighty handy. As a general rule, the cases consisted of debridement, packing and plaster casts etc., and evacuation was done as soon as possible. The organization I worked with was a casualty clearing station, which is comparable to the American clearing station."

North Africa: Written June 25, 1943; received August 8, 1943.

"We have never used chloroform anesthesia nor have we had occasion to make use of endotracheal technique for chest surgery... Pentothal sodium, spinals are most popular and local anesthesia comes in for a good share. We now have several enlisted men incidentally who are very proficient in Pentothal administration. They of necessity had to be trained and they turned out marvelously well."

North Africa: Written June 30, 1943; received July 15, 1943.

"We are doing most of the post-war reconstruction work. It consists mostly of hernia repairs, hemorrhoidectomies, circumcisions, etc., arthrotomies of the knee and casualties incident to mine explosions, etc. To date my staff and I have given about 2500 anesthetics and am now in the process of studying the various agents and techniques used."

United States: July, 1943.

"It seems, that for institutional work the Hollerith card is still the one of choice, but for individual work and for the situation as it now exists in our Army, the Nosworthy card more nearly fits the situation."

United States: July, 1943.

"The conduct of anesthesia in such a hospital (general) is not particularly different from that in a civilian hospital. One interesting variation is that the chief anesthetist (medical officer) is in charge of the operating rooms, supplies, and their use. He is responsible for all equipment, arrangement of schedules (to be passed on by the Chief of Surgery)."

United States: Written July 1, 1943.

"We got our continuous sets and used them for the first time today. Started with 120 mg., L2-L3, 3% solution and finally used 210 mg. in about 2½ hours. I drww a sketch of the bishop's hat (mattress substitute) and we are having one of them made... We have talked the brain men into using more local and pentothal, especially for encephalograms and trephines... We can usually have the patient awake before they leave the table... In using pentothal 2.5 per cent on sailors, I find if they are properly premedicated they don't take any more than you use up there. I have used on the average from 750 mg. to 2200 mg., the 2200 mg. lasting about 1½ hours."

North Africa: Written July 2, 1943; received July 21, 1943.

"We have a 40-bed hospital to run. We are in one wing of a French civilian hospital... We brought our own anesthesia equipment and gas machines which turned out to be a portable Heidbrink. This is a lovely machine except for the lack of flush valves. We cannot fill the bag with gas quickly enough. The French have no gas machines either. They use an ether apparatus that reminds me a great deal of the Flagg Ether Vaporizer... We have been doing spinals supplemented with a little Pentothal which works very well. I have used ether only once here; I avoid it if possible because of the heat. The O. R. is so hot the patient loses a lot of fluid by way of sweating. Pentothal is used in incision of abscesses, reduction of fractures, etc. I have had no complications such as laryngospasm with this drug."

England: Written July 7, 1943; received August 10, 1943.

"Most of my anesthetics are spinal or pentothal. Most of the equipment is British. My gas machine is a Standard "Boyle" machine and looks like a Rube Goldberg nightmare. The tube from the machine to the patient is a corrugated rubber affair about 6 ft. long. We have plenty of trouble getting gas. The American tanks don't fit on the English machines and vice-versa. I have a brand new Heidbrink and can't use it because the English tanks won't fit it. I have a good supply of ether, pentothal, ethyl chloride, procaine and pontocaine. Neosynephrine is not obtainable nor is metycaine or nupercaine. I have a beautiful endotracheal outfit except that there is no laryngoscope... Cyclopropane is rare... About 60% of the cases are fractures of an arm or leg and procaine is always available... I have had good luck with all of my regionals except the popliteal and it has failed only two times out of six. I have been doing local infiltration at the fracture site especially in clavicle fractures with good

results... At present we have no means of giving emergency oxygen except by anesthetic machine... Records are poor."

United States: Written July 8, 1943.

"Spinal analgesia is practically the only method known around here. So far I have given 22 spinals, but I have been able to use transsacral for the six hemorrhoids so far... I have been writing all the preoperative orders... For the most part these boys seem to be about right with morphine gr. 1/4, scopolamine gr. 1/100, and the pentobarbital gr. 1 1/2. We had no scopolamine for a while, and it seems to me that we now have much better sedation than when I was using comparable amounts of atropine.

"Our only local agent is procaine. The ampules come in 100 and 150 mg. sizes and also have tablets for making solutions. We have hypo needles, 20 gage I.V. needles, and 20 to 22 spinal needles. For some reason we also have two long 17 gage needles... We have all kinds of aches, and I have been able to get a few diagnoses established, of sciatica and intercostal neuralgia...

"I have been using Major Wangeman's cards, and they promise to work out very well. I found out very early that I had to code in pencil because I sweat too much and blur the ink, but there have been no other difficulties. I find that I can code all the information during the operations, although I will probably not be able to if I ever give a general anesthetic. On postoperative rounds I carry the code with me and code on the ward. It takes very little extra time, and there are no other hospital records here comparable to them... We have been given one metal airway with an impossible curve. However, with the aid of a monkey wrench, I fixed that and now am waiting to have occasion to use it."

Naval Mobile Hospital: Written July 23, 1943.

"I have four pharmacists mates, second class, working in the department for me and they are progressing nicely and are a big help to me in the operating room. Have just completed anesthesia lectures to 200 pharmacist mates, second class, this week... We have one Heidbrink portable gas machine and nitrous and oxygen on it but lack a soda lime container. Most of our anesthetics are spinal or sodium pentothal but we also have avertin here. I am keeping my hand in at general also."

Sicily: Written July 29, 1943; received August 16, 1943.

"We have been very active as a hospital during this campaign. I have been able to do quite a bit--ether and Pentothal chiefly."

The following is a sample abstract from Volume XV of "Anesthesia Abstracts." Volume I was published in 1937 and the current volume XVI is in the process of preparation. Volume XV was especially prepared for current needs and the majority of the abstracts it contained dealt with plasma, shock and blood substitutes; a portion, of course, dealt with anesthesia.

Bracc, D. E.: Premedication, anaesthesia, oxygen and plasma therapy, for the war gas casualty. Bull. New York M. Coll. Flower & Fifth Ave. Hosps. 5:101-106 (June-Oct.) 1942..

"The problems that are of interest to the anesthetist in war gas poisoning may be grouped under the following headings: (1) The treatment of pain incidental to war gas casualties with local anaesthetic drugs. (2) The treatment of hypoxia or oxygen want that accompanies war gassing. (3) Methods of anaesthesia when surgery must be completed on war gas casualties... . Pain in the area affected is one of the most serious complications of war gas poisoning.... With that group of gases classified as pulmonary irritants the mucous membranes of the upper respiratory tract and the conjunctiva of the eye are the sites of the most intense pain. In addition to the creation of pain these irritants disturb the activities of vital reflexes and alter essential secretory mechanisms, and as a result breathing is seriously affected.... The methods and drugs recommended for the relief of pain in the upper respiratory tract of the conscious patient include the use of local anaesthetic agents. It must be remembered that such drugs applied to the mucous membrane are rapidly absorbed and large quantities must be used, therefore the concentration should be kept in the minimum effective range. Duration of such anaesthesia is enhanced by the use of vasoconstrictor drugs such as adrenalin, but the use of vaso-pressors is not recommended because of their systemic effect.... Local drugs usually recommended include cocaine solutions in 2-5 and 10% dilutions, however, stronger solutions than 2% should not be used.... The aqueous solutions are considered better than the oily solutions in the presence of inflammation. Other agents which have been suggested are the 0.5 to 2% metycaine, 1% nupercaine and 2-4% pontocaine.... Lozenges containing local anaesthetics such as nupercaine, benzocaine and anaesthesan, menthol, chloroform, etc., may have some value. For the conscious gas - patient the use of opiates for pain is questionable, the deciding factor being the degree of hypoxia present.... If morphine is used for pain the pharmacological effects should be established immediately, this is accomplished by administrating the drug intravenously.... Scopolamine has been recommended in combination with morphine for pain in the apprehensive individual. A particularly favorable action of the combination is the pain relief and the added cortical depression. These drugs used together simplify the psychic control of the patient which should be a desirable factor in controlling gassed patients, moreover the cholenergic effects of scopolamine seems to decrease the central respiratory depression of morphine.... The derivatives of barbituric acid have no place in the treatment of pain as they are not analgesic in therapeutic doses and relieve pain only when unconsciousness is produced with anaesthetic doses. The barbiturates have been shown experimentally to cause bronchial constriction which might be of serious import in the presence of hypoxia. Other sedatives and hypnotics such as aspirin, bromides, avertin and paraldehyde are condemned....

"Oxgyen therapy for patients poisoned with chemical agents is not comparable with the oxygen therapy as we ordinarily think of it for patients with circulatory or respiratory disease. First, there is the added factor or irritation and subsequent pathology of respiratory tract tissues exposed to the gases. Second, there exists in serious cases lower tract obstruction from edema, fluid or organized fibrous membrane. Third, in some instances, as in poisoning from mustard gas, inhalations of high oxygen atmosphere greatly enhance the pain and cannot be tolerated. The primary requisites of oxygen therapy for patients exposed to chemical warfare agents is to overcome obstruction, as this is the factor that produces hypoxia.... The oral pharyngeal catheter has been frequently adjudged to be inferior to other techniques, the method is simple, convenient and requires a minimum of equipment and is fairly efficient. With a flow of 6 to 8

litres of oxygen per minute oxygen percentage in the alveoli may be raised to approximately 50%, this concentration is adequate if severe circulatory collapse is not a factor.... If pulmonary edema is present two other procedures have been suggested, first, helium and oxygen mixture with 70% helium and 30% oxygen... This mixture or oxygen alone is efficiently delivered with a Boothby apparatus... Oxygen or mixtures of oxygen and helium under positive pressure have also been recommended, this may be accomplished by a face mask or with a special hood so that the pressure of the respiratory atmosphere is maintained at about 5 millimeters of mercury during both phases of respiration; such pressure increases the gradient drive of the gas on inspiration and serves to ventilate a large number of alveoli and when the expiratory phase is carried out against slight pressure gases trapped in the air sac distal to the obstruction are more efficiently diffused. The use of positive pressure also aids in the reabsorption of edema fluid. Subcutaneous oxygen may be of some value although the experimental and clinical evidence is not extensive.... When surgical intervention becomes necessary for the war gas casualty the anaesthetist is faced with problems of major magnitude. Further handicap among anaesthetists is the lack of agreement as to the method of choice, but there is no lack of opinions or dearth of statements regarding indications and contraindications to spite the fact that there is scarcely no clinical experience or experimental basis for the opinions expressed.... A conscious patient with an operation in progress, even though painless, as with local or regional anaesthesia, who has severe irritation of the respiratory tract or any degree of oxygen want will not be cooperative or comfortable, and the patient's condition may be made worse if sedatives or hypnotics are given in sufficient volume to depress mental and physical activities for the completion of the procedure. This lack of cooperation constitutes a major contraindication for the employment of these techniques. Despite the many and enthusiastic reports of the intravenous barbiturates their use with these casualties must be reviewed critically as these drugs probably have no place in the treatment of cases suffering from oxygen want and impending circulatory collapse. Inhalational anaesthesia need not be avoided if the gases, ethylene, nitrous oxide and cyclopropane, are judiciously used.... If these patients are viewed as potential subjects who will have the fatal syndrome of respiratory obstruction, oxygen want, pulmonary edema, right heart failure and complete circulatory collapse, more can be done by proper inhalational anaesthesia to interrupt this course of events than by other known methods of surgical anaesthesia. The supportive treatment for these patients is important. In the presence of pulmonary edema and signs of right heart failure the use of digitalis, stimulative drugs and intravenous fluids are condemned because of high venous pressure and a constricted peripheral circulatory system. The analeptics have no value for these patients and it is only when circulatory failure occurs that vasoconstrictors or small volumes of plasma should be considered."

United States: Written July 31, 1943.

"Primarily, I'm in charge of all anesthesia. With that I am property officer in surgery and responsible for all property in the surgical building. The training of the enlisted personnel and the nurses in surgery is under my direct supervision. I'm also in charge of transfusion and plasma supplies. Under the heading of anesthetist, it is my duty to see that all patients are properly prepared for surgery, including an adequate physical examination and work-up. Then, of course, the choice and administration of the proper anesthetic agent is entirely my responsibility. We have run as high as 22 surgical

cases in one day... At first, I had no assistants, but finally I managed to have a couple of enlisted men assigned to me to watch spinals and locals while I am busy elsewhere... With this set-up, it is necessary that spinals and local blocks be utilized wherever possible... We have an orthopedic man here who likes to manipulate backs under high caudal anesthesia... In two brachial plexus blocks, I have had only partial success. In both cases, I had good ulnar anesthesia, but incomplete radial in one and incomplete median in the other. I used the single needle technique and seemed to get pretty good parasthesias. The drug used was procaine 2% with epinephrine in the amount of 35 to 40 cc. I have had the opportunity to do many field blocks for hernia, hydrocoele and varicocele. They have proven quite satisfactory. However I have found it necessary to inject subcutaneously, intradermally, and under the fascia just below Poupart's to obtain the best results.... I'll give you a list of the anesthetics that I've had the opportunity of giving... Spinals--many (50 the first 10 days); Generals--N_2O, few; N_2O with ether, few; Pentothal Sodium, many; Field blocks for hernia, varicocele, hydrocele--many; Abdominal blocks--occasional; Block for circumcision--many; Caudals--few; Caudals with transsacral--occasional; Wrist block--occasiona; Ankle blocks--occasional; Breast blocks--2 in soldiers with gynecomastia; Saphenous vein blocks--few; Brachial blocks--2... There is good opportunity here to do many more caudal and caudal sacral blocks than I have done but I neither have the carts for the patients nor the rooms to store them in while the anesthesia is 'soaking'... I have been doing all of my infiltration anesthesia with a 10 cc. G. I. Syringe and spinal needles. Between the needles slipping off of the syringe and the syringe slipping thru my fingers, I can assure you that the air has been dark with undesirable language at times."

United States: Written August 4, 1943.

"We have three operating rooms and one delivery room... Aside from spinal (procaine and metycaine) we have N_2O, ether and sodium pentothal... We have two old models of McKesson and Heidbrink about 1910 vintage."

New Guinea: Written August 7, 1943; received August 22, 1943.

"Pentothal certainly has earned its place in the sun as far as we are concerned. You would be surprised at the large number of these and also spinals that we have accumulated in the past months. We have done a large number of caudals mainly because the obstetricians want to see the technique for future reference."

Australia: Written August 8, 1943; received August 30, 1943.

"Of one little tip (to MDs leaving on assignments with portable surgical hospitals) I've already gotten letters back thanking me (intravenous morphine)."

Sicily: Written August 11, 1943.

"I am doing anesthesia with an evacuation hospital serving freshly wounded men. Capt. ___ and myself are called for cases where wounds are severe, such as in head injuries, chest and abdominal cases. We have an old Gwathmey machine and a new Heidbrink portable with plenty of N_2O and oxygen. The staff takes care of cases where pentothal can be used--about 90% of the cases. We have Foregger folding 'scopes and a good supply of tubes. I am keeping a record

of my cases on punch cards but find it difficult to follow cases post-operative due to rapid evacuation and the rush of cases during a push. I was with the British in Tunisia in a casualty clearing station. I watched with interest anesthesia administered by the Oxford vaporizer. I used rapid induction with pentothal, nasal intubation and the Flagg can issued us."

North Africa: Received August 14, 1943.

"We had 4-1915 model #1 Gwathmey machines--these machines take B tanks only. There was none to be had in the medical supply depot. We had large cylinders of N_2O + O_2. I first had a special yoke made to carry gases from the large cylinders to the machine. Fortunately, we had some oxygen therapy gauges. I then had to make a truck to carry the machine and large cylinders. I next made a soda lime canister out of a #2 tin can, part of a grease gun and part of a navy gas mask... I have had opportunity to try the machine several times and it has proved its worth. I have two such machines in our hospital and have set up oxygen in proper places for protection during pentothal and spinals. I have excellent oxygen therapy equipment and good intratracheal equipment. Seems like there should be someone to properly dispense anesthetic equipment... I have done several blocks... 1 brachial plexus, 1 hernial, 2 transsacrals, 1 nose, 1 scalp, 1 leg block. We had one severely shocked patient yesterday. I gave very light pentothal sodium with 50 per cent N_2O + O_2. The patient did very well."

India: Written August 15, 1943; received August 31, 1943.

"I am at a general hospital. The installation is a permanent one located in a desert... The Operating Suite is in a separate building and lucky for us is the only one fitted with an air conditioning system which functions well. I have been appointed the Chief of Anesthesia and am the only trained anesthetist here... There are two Heidbrink machines with absorbers... However, gases are pretty scarce so we must economize here. The only gases available are nitrous oxide and oxygen, ether and sodium pentothal are plentiful. A large percentage of the work, however, is done under spinal anesthesia with Procaine for short cases and Nupercaine for long ones... It is peculiar, but there is an acute shortage of atropine and scopolamine, so a lot of the cases are pre-medicated merely with morphine and barbiturates (atropine being saved for general cases only). We have free choice of anesthesia and to the pre-and post-op medication. There has not been much occasion for oxygen therapy, but that is my domain likewise. I am glad to say that so far there have been no respiratory complications. Incidentally, I started a course of instruction for the enlisted men in the O. R. to enable them to give open-drop and to be able to watch spinals."

England: Written August 29, 1943.

"I had one patient with paralysis of the left vocal cord following injury in the region between the tip of the mastoid and angle of the mandible. There was also an endotracheal tube left in place for a week. Did the injury or the endotracheal tube give rise to this paralysis of the vocal cord? Absolute proof is obtainable by inserting an electrode into the muscles of the larynx and recording the muscle action potential by means of the oscillograph. If the laryngeal muscle is denervated, an entirely different picture will be seen than that seen by an innervated vocal cord. The other possibility for paralysis of this cord is some affliction of the joints and cartilages. At present I am all alone here in anesthesia. The work is a combination of elective and air force raiding casualties. I have been using Neuworthy's record card. I am able to spend a good deal of time on the wards visiting patients before & after

United States: Written September 3, 1943.

"Spinal is our mainstay for most major procedures below the navel, including an increasing number of continuous spinals. I have had good luck in introducing . . . superficial cervical block in thyroidectomy, and Second division block for the Caldwell-Luc operation. Inasmuch as we offer obstetrical service to military dependents we have become very popular in dispensing continuous caudal. I might say in this connection that we are very pleased with the use of a F4 ureteral catheter and a 14 ga. needle. Our standby for inhalation not requiring great relaxation is N_2O + O_2 + pentothal. Being short of personnel, we have had our brace shop rig up a syringe holder so that one person can easily handle the mask and the syringe... We have only Army Model McKesson Gas machines. Our suction machines are very rough, and not entirely satisfactory. There is no provision for an ether blow bottle such as is commonly used for tonsillectomy in children. We are fairly well equipped with folding Foregger laryngoscopes...

"The only pentothal syringes available to us are 30 cc.... I have been using a 3 1/3% solution for convenience and find it quite satisfactory. Needles for intravenous work are abundant and satisfactory except when a very large one is desirable. We have nothing suitable larger than 19 gage. Needles for regional work are unsatisfactory as supplied. For oxygen therapy many BLB nasal and oro-nasal masks are supplied, as are Hoffbrink humidifier bottles for naso-pharyngeal administration. Our tent sets are not yet complete. Intravenous fluids are supplied in Baxter, Cutter, and Abbott bottles... It is my experience that there are three essentials in acquiring non-standard equipment. They are: 1. The hearty endorsement of the commanding officer. 2. A letter accompanying each requested item. 3. A careful description of the item as to catalogue number, cost, etc. Three to six months is a fair estimate as to the time required."

Canada: Written September 10, 1943.

"I've learned a lot, particularly as far as premedication is concerned. I soon found out that civilian standards are much too low... I feel the excessive smoker upsets our usual standards for premedication... I am now using for the ordinary 150 lb., nembutal grs. iii 2 hrs. preoperatively and morphia gr. 1/4 and atropine gr. 1/150 as a basis. If a spinal anesthetic is to be used I substitute hyoscine gr. 1/100 for the atropine and have found it to be much better. The patient is more cooperative and the variations of pulse and blood pressure are somewhat les... I had never realized the importance of atropine in the premedication for pentothal sodium. I had a number of cases of laryngospasm and bronchospasm before I realized the source of my trouble. Since I've been using adequate doses of atropine, I haven't had a case of laryngospasm or bronchospasm. I often used atropine gr. 1/75. I have used all these premedicants intravenously...

"I've been quite surprised with pontocaine. So far I have seen nausea in only one case and the initial fall in blood pressure has been less than I would have expected had I used procaine. However, I've only used pontocaine some twenty odd times and no conclusions can be drawn from that. The main disadvantage I've seen to its use so far is the time factor. In some cases anesthesia hasn't appeared until 1/2 hour after giving the pontocaine. In an attempt to overcome this disadvantage and to satisfy my curiosity I gave a small amount of procaine (50 mgs.) combined with the usual dose of pontocaine. Anesthesia came on immediately...