have not taken up this method. McMechan, the editor of the "Year Book of Anesthesia and Analgesia," has repeatedly advised professional anesthetists to study the administration of local and regional anesthesia, and no doubt the future will see this accomplished.

One advantage to the surgeon, in this combination, is the prevention of delay by the presence of the anesthetist, when it becomes necessary to augment the local anesthesia with general, as, for instance, in many intra-thoracic operations.

EUGENE HOWARD BARBERA, M. D. (Federal Realty Building, Oakland)—It is to be regretted that, generally speaking, we find the surgeons of France, Germany, Italy, and South America becoming more enthusiastic in the art of regional anesthesia than are we of America. This particular field of work calls for exact knowledge of anatomical relations and demands considerable skill. Daily one sees opportunities in the operating-room to apply this particular type of anesthesia, yet the patient is denied this degree of safety because of the operator's inexperience with the method. I most vividly recall the influenza epidemic, at which time a general anesthetic often invited disaster. A surgeon or physician anesthetist skilled in regional anesthesia would have approached these emergency cases with less fear in his heart than we did. One cannot accept this method for all cases, nor should we attempt to carry it out on the neurotic, hypersensitive individual, who most often is best handled under a carefully administered inhalation anesthetic.

Finally, the conclusions of Doctors Phillips and Johnson seem too logical to refute in this present era of surgical endeavor.

W. A. SHAW, M. D. (Pioneer Building, Elko, Nevada)—The paper of Doctors Phillips and Johnson sets forth the advantage of regional anesthesia, as well as very accurately describing the necessary technique.

Nerve block demands special skill, but most surgeons can quite satisfactorily do a field block if they so desire. I feel that the extra trouble involved in administrating field or nerve block is responsible for the fact that it is not used more frequently.

In the larger centers where much surgery is done, the specialist in anesthesia should do this sort of work, while in most hospitals where such specialists are not available, in my opinion the surgeon should familiarize himself with the technique and be able to do regional anesthesia.

In the rather large class of patients known as poor surgical risks, regional anesthesia undoubtedly has its field unopposed by any form of general anesthesia, the administration of which would surely increase the danger of any operative procedure.

WILLIAM W. HUTCHINSON, M.D. (Baker-Detwiler Building, Los Angeles)—No one who has the advancement of the science of anesthesiology at heart could help being intensely interested in this paper. The writers have gone into the technique of the procedure with unusual clearness, which makes the paper of exceptional value. That regional anesthesia has its place in surgery cannot be denied by the most enthusiastic proponents of inhalation anesthesia. This fact is proven by its extensive use, especially in Europe, where it has largely supplanted inhalation anesthesia in some of the clinics. It must be remembered, however, that in these clinics the patients are not given the opportunity of choice. The average American with his high-strung nervous system would prefer unconsciousness during a surgical procedure.

On one point I wish to take issue with the writers of the paper. They state, "Inhalation narcosis may be administered by the unskilled." To my mind this is a mistake often made by surgeons. To allow the administration of an inhalation anesthetic, especially nitrous oxide, by an inexperienced or unskilled person is jeopardizing the life of the patient and the surgeon's reputation.

In conclusion, I should urge the specialists in anesthesia to thoroughly familiarize themselves with the technique of regional anesthesia and be prepared to relieve the surgeon of the actual work in the selected cases where this method is indicatd. The surgeon is often too busy with his surgical problems to develop the technique and assume the responsibility of the anesthetic.

PHILLIPS AND JOHNSON (closing)—Further study will probably define the field of regional anesthesia. There are certain shortcomings of the method which we believe at present are as follows:

It does not fulfill our second requirement as we have defined it—i. e., it does not allay the mental shock. With the critically ill patients where this type of anesthesia seems to be particularly indicated, the mental element is active only to a minor degree. Within our prescribed limits this objection holds good only to a minor degree.

The second shortcoming of the method we would designate its "uncertainty." Even in the most skillful hands the percentage of failures will approximate 20 per cent. In most instances the lack of success is only partial and the administration of a small amount of inhalation anesthetic will permit a painless completion of the operation. There are still others in which the failure is complete, and these are due to a variety of causes.

In all surgical work the welfare of the patient is paramount, but with other things equal the operator working under a severe nervous tension may not exercise the refinement of judgment displayed under more favorable conditions. In other words, when the uncertainties of the anesthetic are added to the responsibilities of a difficult operation, in the presence of a conscious patient the operator's acumen may be affected. We believe the technical difficulties of the method are too great for it to supplant the general anesthetic, except along certain lines.

In conclusion, we desire to express our appreciation to the gentlemen who have discussed this paper, and to Labat, whose technique we have followed closely in our clinical work.

CAESAREAN SECTION FOR HEMORRHAGE

By REGINALD KNIGHT SMITH, M. D., *San Francisco*

The consensus of obstetric opinion has gradually focused to the point of agreement that in only a small percentage of cases of placenta previa is Caesarean section indicated.

Of 4002 obstetric cases that passed through my records prior to December 31, 1922, placenta previa—all forms—occurred twenty-eight times, with a maternal mortality of 0 per cent and a fetal mortality of 6 or 21 + per cent.

DISCUSSION *by K. L. Schaupp, San Francisco; Martha Welpton, San Diego; E. T. Rulison, Sacramento.*

HEMORRHAGE from the birth canal of the pregnant woman, especially during the latter half of pregnancy, is always the cause of alarm and apprehension to the patient and her family, and it is a danger, in varying degrees, to both mother and child.

To the obstetrician it means an added heavy responsibility and the urgent need for early and correct diagnoses of the causes of the hemorrhage, and the prompt institution of the treatment of the patient.

The first thought in the doctor's mind will be placenta previa with its varying types known as lateral, marginal, and central implantations and his mental picture of the unfavorable prognosis in each when the patient is not aided by obstetric art. The risk to the mother rises from a low percentage in the marginal to inevitable death in the complete form; it decreasing to from 3 to 10 per cent under intelligent obstetric procedures, such as Broxton Hick version and the use of bags, applied either with or without previous rupture of the membranes.

The physician's second thought will be of the so-called accidental hemorrhage, carrying as it does a maternal mortality as high as 95 per cent, and decreasing under competent obstetric care to about 60 per cent. And his third thought will be of the risks to the child in each of these conditions, with a pic-

ture of the chances for its survival under obstetric treatment.

With the advances made in abdominal surgery it was to be expected that the suggestion of Caesarean section for each of these pathological conditions, of which hemorrhage is the outstanding symptom, would be made. Since it was made there has accumulated an unusually large amount of literature in favor of and much against this mode of treatment. This I have no intention of reviewing.

The consensus of obstetric opinion has gradually focused to the point of agreement that in only a small percentage of cases of placenta previa is Caesarean section indicated. This, approximately 5 per cent, includes those with a long rigid os, viable child, pelvic distortion, cardiac disease, or who have other complications in addition to the placenta previa.

Caesarean section should be the method of choice in the treatment, and should be promptly done in almost all cases of accidental hemorrhage.

Facts compiled from published statistics do not show improvement in the mortality rate of mothers from operation for placenta previa; but do show a marked increase in the chances of survival of the child. For accidental hemorrhage there is a marked improvement in the chances for the mother, but no change in the risk to the child.

Of 4002 obstetric cases that passed through my records prior to December 31, 1922, placenta previa—all forms—occurred twenty-eight times, with a maternal mortality of 0 or 0 per cent; and a fetal mortality of 6 or 21 + per cent.

The method of delivery has been: (1) Rupture of membranes only with spontaneous delivery, 5; maternal deaths, 0; and fetal deaths, 1. (2) Bag introduction with or without version, 8; with maternal mortality, 0; fetal mortality, 4. (One child was viable, three non-viable in this group.) (3) Caesarean section, 15, with maternal mortality, 0; fetal mortality, 1. (Child was diagnosed as dead before operation, but mother and family insisted on giving the child the benefit of the doubt, in the hope that we were mistaken in our diagnosis of its death.)

Accidental hemorrhage occurred in twelve patients, with a maternal mortality of 1 or 8.33 per cent, and a fetal mortality of 8 or 66.33 per cent.

The method of treatment of these patients has been: (1) Dilation of cervix with rupture of membranes and spontaneous or instrumental delivery, 4; maternal mortality, 1 or 25 per cent; and fetal mortality, 2 or 50 per cent. (2) Bags introduced, with either spontaneous, version or instrumental delivery, 2, with maternal mortality, 0 or 0 per cent; and fetal mortality, 2 or 100 per cent. (Both of these cases were directly traumatic at fifth and sixth month of gestation, occurring as result of a jam on street-cars, and were, therefore, non-viable.) (3) Caesarean section, 6, with maternal mortality, 0; and fetal mortality, 4 or 66.66 per cent. The two infants surviving were one full-term child of a mother with a severe heart lesion and in hospital when the hemorrhage began. The other was premature, the hemorrhage developing after a severe muscular effort, the flow of blood slight, and the pain and other symptoms subsiding, the child being delivered a few days later and a small, old clot about two inches across and adhering to the placenta when it was delivered. In the other four cases there was total separation of the placenta and, therefore, no hope for the child. Hysterectomy was not considered necessary or advisable in any of these patients.

It is not to be forgotten that pregnancies subsequent to Caesarean section are permanently complicated by the presence of a scar in the line of the incision in the uterus, generally necessitating the termination of such pregnancy by another Caesarean section, or exposing the patient and child to the risk of uterine rupture, carrying with it a much larger risk than the spontaneous delivery of a normal labor.

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DISCUSSION

KARL L. SCHAUPP, M. D. (516 Sutter Street, San Francisco)—Doctor Smith has stated the case of Caesarean section for hemorrhage very concisely and clearly. His opinion is particularly valuable because each of this series of four thousand women was delivered by his own hand, and the report is not based upon the clinical work of assistants or students. It is a personal experience.

Smith's conclusions and experiences are in line with my own at the Stanford women's clinic and at the San Francisco Hospital. I agree with him that abdominal section as the means of delivery in placenta previa is rarely necessary, Voorhees' bags being perhaps a greater life-saving measure.

The status of accidental hemorrhage, however, is quite a different matter. As in placenta previa, there are varying degrees of placental separation in placenta ablatio. Very often during the course of the third stage of labor I find evidence of a small area of a separation where clotting has occurred and progress of the separation stopped. At other times during labor, or just before its onset, there is bright bleeding, which is not explained, by low implantation of the placenta. This may be present in such a severe degree that interference may be necessary, but more often the onset of labor or the rupture of the membrane may exert sufficient pressure to check the progress of the separation.

Where placental implantation is in the normal position and external bleeding occurs, we know that the accumulating blood has dissected its way to the external os. Here the child has a good prognosis, for there is usually sufficient placental attachment to insure the nutrition during the balance of the labor. It is not this type, however, where we turn to Caesarean section, unless there are complicating features.

The true, complete premature separation of the normally implanted placenta presents a striking picture, which is perhaps best described by the term "placenta abruptio or apoplexy of the placenta." This implies something sudden and severe, and this implication is well borne out by the symptomatology: Sudden and continuous abdominal pain, increasing in intensity; no relaxation or rhythmic contraction of the uterine muscle; the hard, board-like uterus, painfully tender to palpation; the sense of disaster experienced by the patient, and the sudden onset of shock present a never-to-be-forgotten picture. In such a situation the progress of the separation and bleeding is so sudden and shock so profound, that there is only one thought, namely, to stop the hemorrhage as quickly as possible. If this should occur during labor and the cervix is well dilated or dilatable, delivery by means of version and extraction or by means of forceps may be successful. I have seen only one such case, however, for by far the greater number occur before the onset of labor.

In complete separation, I feel the Caesarean section is always the operation of choice. It is the quickest and safest for the mother. The child here is not to be considered, for fetal life ceased with the separation. Bags are out of the question, because their efficiency depends upon the ability of the uterine muscle to contract, and this function has been lost. Again, the time necessary for dilation by this means would be far too long. Manual dilation, while faster, may likewise be too slow and too

uncertain. Version is dangerous because the infiltration of the uterine muscle with blood makes it so friable that there is danger of uterine rupture.

True complete placental separation is rare—so rare, in fact, that in four thousand patients Smith has had I dare say only six, the six upon whom Caesarean section was performed.

MARTHA WELPTON, M. D. (First National Bank Building, San Diego, Calif.)—As Dr. Schaupp has said, Dr. Smith's report is of great value because it is a record of his own personal work. Both Smith and Schaupp have been clear and concise in their presentation.

Three things I wish to emphasize. First, the mother's right to decide on the procedure to be followed. After the physician has discussed with her the probable results of each procedure—non-surgical and surgical—the decision should be left with her. The woman who is not young and who is ready to deliver her first living child will probably insist upon taking all the risk herself in order to insure the life of her child. Second, a woman who has had one Caesarean section and again becomes pregnant has at least six months in which to put herself under the care of a competent obstetrician. When labor begins she can go into the hospital, be under constant supervision, so the worst which can possibly happen will be a second Caesarean section. Third, in a hurried delivery with forceps we should never forget the possible trauma to the child's head.

E. T. RULISON, M. D. (California State Life Building, Sacramento, Calif.)—Doctor Smith's statement that "in only a small percentage of cases of placenta previa is Caesarean section indicated, approximately 5 per cent" is a challenge to the rather numerous obstetrical specialists who are performing Caesarean operations indiscriminately. In this condition, as well as eclampsia, the mortality of the procedure must be considered. Statistics were gathered from a number of small city hospitals a few years ago which indicated that maternal mortality from the Caesarean operation ranges from 10 to 25 per cent. It would seem that the advocates of its wide application in eclampsia and placenta previa have had in mind only the results attainable in their own hands. To my mind the Voorhees bag procedure is the one that should be urged, except in cases with long, rigid os, as the maternal mortality in the hands of the average obstetrician will necessarily be lower. The pathology of placenta ablatio makes the Caesarean section the logical procedure.

I cannot subscribe to Doctor Welpton's statement that the mother has the right to decide the procedure to be followed. Many times a woman pleads for Caesarean because some friend has told of the easy way out that this procedure offers. The judgment of a woman in labor should not be decisive when such a heavy responsibility is resting upon the physician, as obtains in the conditions under discussion.

Neither can I subscribe to Doctor Welpton's second point in regard to safety of the second Caesarean, because it is possible that the woman may pass into less capable hands in the second instance.

The high cost of sickness is causing changes. There is a growing demand that this cost be distributed over large population groups. The principle of insurance against sickness is being applied in different ways. In some countries the state system of compulsory insurance has been adopted. Elsewhere, hospital associations and sick benefit societies are, for a small weekly or monthly fee, guaranteeing free care in case of illness. Industrial groups are providing medical hospital care in return for small sums deducted from the wages of employes and supplemented by contributions from the companies. Such developments, which are multiplying rapidly, have a bearing upon the future of the medical profession.—President Vincent of the Rockefeller Foundation, Ohio Medical Journal.

"A Chinaman had wandered from a cook-house in Yellowstone National Park in winter. Looking back over his shoulder, he saw a bear sniffing at his tracks and rapidly gaining on him.

"He called out shrilly, as he began to run: 'You likee my tracks? I makee you some more.'"

THE DIFFERENTIAL LEUCOCYTE COUNT IN ACUTE INFLAMMATORY CONDITIONS OF SURGICAL IMPORTANCE

By NEWTON EVANS, M. D., AND PHILLIPS J. TUNNELL, M. D., *Loma Linda, California*

Impressions gained from the differential leucocyte count are of the greatest importance in surgical and other inflammatory conditions.

One of the most important places where help can be gained from the polymorphonuclear differential count is in making initial pre-operative diagnosis in acute appendicitis and its abdominal complications. A failure to make use of this will, in some instances, lead to disaster.

Among the most striking exceptions to the general rule is the remarkable rise of the total leucocyte count, with an apparent elevation of the Walker's Index of Resistance, which occurs in many fatal cases of peritonitis and similar inflammatory conditions, within the last few hours before death.

DISCUSSION *by John V. Barrow, Los Angeles; Howard Dignan, San Francisco; Clarence A. Johnson, Los Angeles; Ernest A. Victors, San Francisco.*

OUR purpose in presenting this study is not to try to add any essential facts to the information already available in regard to the meaning of white cell counts in acute infectious conditions. Rather, it is an effort to call to your attention the well-authenticated facts regarding the significance of the leucocyte counts, and to emphasize at least by reiterating their importance.

The available literature makes it evident that the *differential* leucocyte count is a measure of great importance in the diagnosis and prognosis of acute infectious conditions. In the face of this, the extreme paucity of articles dealing with the subject in the medical literature of the past twenty years is rather surprising; and personal observation as to the lack of appreciation and use of this simple test in the handling of acute surgical conditions by the average surgeon makes it evident that it is not given the attention its importance deserves.

The two ordinary methods of numerical estimation of leucocytes in the circulating blood are: First, the total leucocyte count indicating the total number of white cells in a given volume of blood, expressed as the number per cubic millimeter. This is determined by the use of the diluting pipette and the blood-counting slide. Second, the differential count to determine the relative proportion of the various kinds of white cells in a specimen, expressed as percentages of the different forms, accomplished by observation of a given number of leucocytes in a stained smear of the blood. For the purpose of the present subject, attention is given only to the proportion of the polymorphonuclear leucocytes to the other forms.

Our observation of the methods of handling acute infections of surgical importance in well-regulated hospitals and of the practice of a large proportion of surgeons is that they are largely uninformed as to the meaning and value of the differential count, or at least have forgotten to apply such information if they ever had it, in the treatment of this important class of patients. Speaking from the viewpoint of the clinical pathologist, we have on many occasions been surprised at the great dependence which many surgeons place upon the total leucocyte count in making the initial diagnosis of acute appendicitis.