THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

JUNE 1, 1906.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XXII.—*The Frontiers of Death in Surgery and the Question of Operation in Extremis.* By CHARLES GREENE CUMSTON, M.D., Boston, Mass.

THE incessant progress of surgery, sanctioned by almost un-hoped-for success, has very greatly increased the indications for operation in imperative surgery. Certain cases, which only a few years ago would have seemed hopeless, are to-day operated upon, and the wonderful results obtained show that the interference was justified. It is not, unfortunately, always thus, for all human power has its limits. There are patients who, when seen by the surgeon, represent organisms which are ruined, and where all science loses its rights. The question of interfering in these cases is a difficult problem to solve, and in what is to follow I will rapidly enumerate those affections which represent that class coming under the head of imperative surgery, after which I will study those symptoms which will allow one to make a prognosis and decide whether or not to operate, at the same time discussing certain conditions which relate to the general and constitutional condition of patients in general.

It would be impossible to enumerate all those diseases which end in an imperative operation, and I will merely endeavour to classify as methodically as possible those which most frequently come under daily observation. Numerous are the traumatisms which may necessitate an operation of extreme urgency, likewise conditions very nearly related in reality or in appearance to the approach of death. These we will mention according to the anatomical region in which they occur.

(1.) Fractures of the base or other parts of the skull, with or without wounds; bullet wounds of the cranium, more particularly of the orbit, mouth or ear.

(2.) Wounds of the neck involving large vessels, fractures and wounds of the larynx and trachea, with their always possible complication—œdema of the glottis. Burns of the pharynx, œsophagus and the stomach, with all their complications.

(3.) Closed traumatisms of the chest and rupture of the lung; penetrating wounds of the lung and pleura; thoraco-abdominal wounds; ruptures and wounds of the diaphragm, pericardium and heart.

(4.) Contusions and wounds of the abdomen, with all their serious complications; contusions, wounds, and ruptures of the liver and biliary tract, of the spleen or kidneys, mesentery and intestine.

(5.) Traumatisms of the hypogastric region and wounds or rupture of the bladder, rectum, or a pregnant or non-pregnant uterus.

(6.) And, lastly, traumatisms of the limbs, compound fractures and extensive crushing.

Severe hæmorrhage, which so frequently endangers life, may be divided into two large classes, the first of which comprises external hæmorrhage. External loss of blood is produced by the most varied lesions, and there is not a single region of the body which cannot give rise to it. Among them, however, one should give a separate place to uterine hæmorrhage of any kind, whether due to placenta prævia, retained placenta—either total or only a portion of

it—or from some disease of the organ itself. To this same particular group belong secondary hæmorrhages following vaginal operations. The second class is composed of internal hæmorrhages, which may also result from different kinds of traumatisms, whether some internal organ has been the recipient of an injury without any solution of continuity in the integuments, or on account of the very small proportions of the latter the blood is prevented from escaping outwardly, and flows into one of the internal cavities of the body. The extreme frequency and great importance of peritoneal inundation, due to a rupture of an extra-uterine gestation sac should be mentioned here, and this same accident may also occur, although very rarely, from rupture of a pregnant uterus.

Nervous shock, which is the symptomatic *ensemble* of a very complex ætiology, is still another frequent consequence of major traumatisms, especially when the structures involved are the spinal column or the skull. It may also arise after traumatisms of the abdomen or during the progress of peritoneal infections, and the peculiar aspect that it then assumes makes it a special form of shock, ordinarily termed abdominal.

The shaking up following major surgical operations, by acting in a manner as yet poorly elucidated, perhaps by reflex action on the nervous system and vascular apparatus, is still another very interesting variety of shock.

Infections are, with traumatisms, the most important class of affections which may result in the most serious outcome. It would be a difficult matter to enumerate all, but I would particularly mention, beside the most varied type of infection, infectious phlegmon of the neck, empyema of the pleural cavity, abscess of the liver, hypophrenic perinephritic, hypogastric and iliac pus collections, urinary abscess and so forth, representing a series of conditions which may occupy a very important place in the history of imperative surgery.

Peritonitis—a disease of extreme gravity—represents a

very large class of imperative interventions. Primary or secondary peritonitis, due to tuberculosis, the streptococcus, occasionally the pneumococcus; those which follow the extension of uterine or tubal infections from the rupture of their pockets of suppuration; the torsion of the pedicles of pelvic or abdominal tumours; and, above all, the peritonitis resulting from appendicitis, from perforation of ulcer of the stomach or duodenum, peritonitis from intestinal perforation in typhoid fever, puerperal peritonitis followed or not by generalised puerperal infection, are all conditions which usually require immediate action on the part of the surgeon. Including intestinal occlusion and strangulated hernia in the same class as peritonitis and the infections, as we do, is because these accidents may give rise to peritoneal infection, and, what is still worse, to stercoræmia.

In terminating, we would point out that the surgeon is often called upon to operate during the progress or at the end of various cachexiæ, whether they are the final termination of some diathesis—as, for example, diabetes—or both from a diathesis and suppuration. These conditions should never be overlooked nor neglected when in presence of an urgent operative case, and I shall revert to this subject again when speaking of the influence of diathetic diseases on the operative indications in imperative surgery.

Surgeons are frequently called upon to judge of the exact probability of an approaching end, and we all know what a very great interest, both morally and from the standpoint of practice, there is, under these circumstances, to determine whether or not the patient is already *in articulo mortis*. By this we mean the condition of absolute ruin of the organism which will shortly and surely be followed by death. If there was any symptomatic *ensemble* as, for instance, exists in meningitis, the task would be very greatly simplified. But the approach of death is not a morbid entity, and as there is not one but many ways in which it supervenes with a variable pro-

gress according to the diseases which afflict the patient, the symptomatic complex of the near end varies indefinitely. Death does not take us all in the same way. Sometimes it strikes with a fearful brutality, at others with all the refinements of slow cruelty. Human beings do not all conduct themselves alike at its approach; some, tired of a useless struggle, give themselves up, while others hold out up to the very end an obstinate defence of their vitality, only giving up the combat after the *coup de grace*. No matter how complex and how different may be the group of signs indicative of approaching death, they can be divided into four classes—namely, the general aspect of the patient, the condition of circulation and respiration, the condition of certain secretions, excretions, and, lastly, the apparent changes which have taken place in the functions of the nervous system. We will now take up in detail each one of these four subjects, and study the nature and prognostic value of the signs to which each gives rise.

The general aspect of a dying man is most striking—the indifference to everything surrounding him and his unconsciousness of suffering. This is not a condition always present, because when speaking of the changes in the nervous system I will show that this sign may be wanting; but it is the rule in a large majority of cases. The patient who is about to die is indifferent and insensible; within an hour he was occupied with those surrounding him, but suddenly he ceases in his lamentations and complaints. Another, who has been tortured by such localised pain that he was obliged to cry out, will suddenly become insensible to such an extent that pressure exercised upon the painful point does not appear to awaken the slightest sensation. These signs are certainly such as to render the prognosis fatal within a very short time.

Considering now the expression of the face, it should be said that it cannot furnish us with any knowledge of an infallible prognostic value, but by carefully observing it an indefinite and vague impression may be gathered

which, without giving one any exact clinical indication, will, however, very frequently make the observing and educated practitioner suspect the approach of a fatal outcome. The widely opened eyes, sunken in that earthy coloured face, present a strange fixity; the globes remain immovable, the eye-lids likewise, the extreme dilatation of the pupil, which no longer reacts to light, represents the death of sight. The nose, which is pinched, is cold; the nostrils vibrate feebly, although occasionally they may move with great rapidity. The open mouth, whose withered lips are in contact with the dental arches, is half opened, and the lower jaw is agitated by a convulsive chewing movement. If one leans over this half opened mouth the breath comes to the observer's face like a weak current of cold air on account of the lowering of the temperature of the gases expelled during expiration. At the same time the breath has a special fetid odour, quite similar to that of a room in which a cadaver has been kept. This peculiar cadaveric odour of the breath is a sign which never misleads; these unhealthy gusts precede the supreme breath, the last one which will be expired from the lips of the dying man. Such is the general aspect and expression of the dying. They realise an *ensemble* of a real prognostic value, and when encountered the surgeon should do away with all thought of operating, which would be useless, because although he may be able to aid a threatened life, he cannot vanquish death, which is already victorious.

We now come to the condition of the pulse and circulation, which give us most important signs. The pulse shows the condition of the heart and the circulation. It faithfully indicates the result of reciprocal influences which the great central motor and the peripheral capillaries exert upon each other. Now, if auscultation gives in a most precise way the nature and the degree of cardiac lesions, the pulse, by its regularity and fulness, indicates the degree of myocardiac tonicity and functional compensation. The pulse, considered from the surgical stand-

point, presents three important characters—namely, its frequency, amplitude, and rhythm—as well as the various modalities according to which these three characters become combined, varying in infinite ways and multiple complexities. It is by a close analysis and an attentive examination that the surgeon will obtain the most important clinical knowledge of the case and the most decisive indications for interference.

Now, in point of fact, in each one of the conditions that have been mentioned as giving rise to cases of imperative operations it is the pulse which will indicate the imminence of the danger and the nearness of a fatal issue. In the major traumatisms the pulse is usually small and very frequent, and the degree of these two characters measures the gravity of the situation. But it is especially when the pulse is small, and at the same time slow and weak, that one may, when in presence of this symptomatic *ensemble* of the severest cerebral commotion, await the worst immediate consequences. These facts are applicable to cases of nervous shock, upon which it is unnecessary to further insist. In hæmorrhage, and more especially when it is internal, the pulse is rapid, small, and will almost escape detection. The examining finger feels the shock of the beat less and less, and this depression, when it becomes progressive, is of the gravest import, especially so if it continues after the use of injections of artificial serum.

We now come to those affections in which the prognostic value of the pulse attains its highest importance—namely, the various infections. These include the extensive class of peritonitides, which will be considered more fully further on. In localised infections the pulse and temperature ordinarily follow each other, and the simultaneous rise of their respective curves belong to the usual symptomatic complex of fever. Under the most varied circumstances and diseases this co-ordination of the pulse and temperature is excellent as far as the prognosis is concerned. Nevertheless, as soon as an acute inflammatory infection is replaced by a generalised infection, more or less viru-

lent, the correlation between the pulse and temperature ceases—the former rises and the latter becomes lower. In some cases it is the pulse which increases in frequency, while the temperature curve becomes hypothermic; and here we are dealing with the pulse of infection, as is observed, for example, in the hypertoxic forms of appendicitis. In other cases it is just the reverse, and the pulse becomes weaker as the rise in temperature becomes greater. The signification of this phenomenon is the early arrival of death. In both cases it will be seen that it is the continually increasing difference between the corresponding points of the two superimposed curves which measures almost mathematically the imminent danger.

In studying the numerous cases of imperative surgery of all kinds we shall always find this assertion verified; all patients presenting a rapid and weak pulse, with the temperature at, or below, normal, will die whether operated upon or not, and under no other circumstances does the condition of the pulse attain such a high value. Consequently, the diagnosis, as well as the prognosis, in surgical affections of the abdomen, particularly in peritonitis, no matter what may be its nature or origin, is revealed by the study of the pulse and temperature. In these affections the pulse is usually rapid, very small, frequently irregular, and, at an advanced period of the process, becomes imperceptible, and cannot be counted. If the infection progresses, if the danger increases, the frequency and the smallness of the pulse also augment at the same time. Now, of these two factors—namely, frequency and smallness—it is the latter which, above all, should be considered. If the beats vary from 140 to 150, but retain sufficient force to be counted with ease, all hope should not be given up, but, on the contrary, if the pulse is extremely rapid, small, irregular and intermittent, the patient will soon die. Consequently, it is the amplitude and strength of the pulse which should be particularly taken into consideration, and when these two conditions are well marked one may operate with some small chance of success.

From what has been said one may conclude that the examination of the pulse is not only an element in the prognosis, but that it is the best source from which to obtain all practical indications. Although the interpretation of the results of this examination varies with each affection and in each particular case, it may be admitted in a general way that the most important characters of the pulse in surgery are to be found in its amplitude and the relation of its curve with that of the elevation of temperature, and that as far as the prognosis of a near death and the operative indications in cases of extreme urgency, if the condition of the pulse, no more than other symptoms present, is not alone sufficient to settle the question, it nevertheless remains the fundamental element in favour of or against the chances of the patient's recovery.

The respiration will also give indications which, although not so important as those obtained by the pulse, should never be neglected. One should take into consideration the rhythm, frequency and amplitude of the respiratory movements. These do not follow the pulse, and they may become increased or lowered quite independently, but the most unfortunate condition is certainly when there is discord between their frequency and that of the pulse. A very slow or a very rapid respiration, and especially any irregularity of the rhythm and of amplitude, are also very bad symptoms, testifying to a profound weakness of the vitality. There is also a sign which is most worthy of remark in many moribunds—namely, the reflex automatic character of the respiration; regular and superficial, these movements give to the thorax the appearance of a bellows.

The temperature and its prognostic importance may be quite properly considered here relative to the signs drawn from the condition of the circulation and the respiration, because the physiological thermic phenomenon is intimately united to these two functions. The exactitude of the thermic condition, which can be mathematically registered by the thermometer, would seem, upon the first

glance, to be the principal and most precise indication of the prognosis; but this, however, is not the case. Now, although one may obtain a great deal from the extreme variations of the thermic curve, it must be said that these have nothing absolute in them. An extreme elevation of the temperature means imminent death only when accompanied by a miserable condition of the pulse, and when there is discord between these two indications it is the pulse upon which one should rely.

A considerable lowering of the local temperature in certain parts of the body, especially of the extremities and the nose, should also be mentioned. This sign is met with in a number of serious conditions, but it does not constitute a certain symptom of approaching death, because in many cases where this sign is present the patients ultimately recover.

The condition of some of the secretions and excretions should not escape the investigation of the clinician, and the results of this examination will often be fruitful. In the first place the skin, which is generally dry, almost like parchment, even in the axilla and groin, is the seat in certain irregularly distributed isolated regions of a particular sudation, the viscid products of which give to the examining finger a most disagreeable, cold sensation. Everywhere else it is dry, without elasticity, and has a greyish hue.

The secretion of the eyes, which is profoundly disturbed, does not take place, and dryness of the cornea and conjunctiva coincides with that of the nasal mucosa. The great Lasègue attached such a great importance to the latter signs that he did not hesitate to say that "a man who sneezes is not going to die and a child who sheds tears in crying is saved; the same may be said for subjects whose nasal secretion is present, even if other alarming symptoms are manifest."

The condition of the secretion and excretion of urine is of great importance, because the renal function plays a very important part in the general vital phenomena.

When it is going on normally it is by it that the organism rids itself of a large number of useless or dangerous materials, and in those cases of pathological intoxication it is by the urine that the elimination of the various toxins is accomplished. It may be readily understood that, when in the presence of serious conditions, or even hopeless ones, the condition of the urinary secretions should be closely examined. In cases of serious infection or major traumatism the disturbances in the renal secretion manifest themselves in two ways—namely, by absolute arrest (otherwise designated anuria) or in a more attenuated form, namely, marked diminution (commonly termed oliguria).

When the patient passes no urine there is a question to be considered which is not without importance—namely, Does anuria really exist, or is it simply in appearance? In other terms, is there only a defect in the excretion of urine, retained in the bladder on account of some mechanical disturbance of the urinary apparatus, or have the kidneys ceased to secrete? Percussion of the hypogastric region or, better still, the introduction of a catheter will remove all doubt, greatly to the profit of the prognosis. When the patient urinates but little, another cause of error intervenes but of quite a reverse nature to the foregoing. There may, in point of fact, be a production of a very small quantity of urine, which the bladder does not hold, and, on account of a weakening of the tonicity of the sphincters, the urine flows away from the urethra drop by drop, thus simulating incontinence from over-distension. The absence of suprapubic dulness or the introduction of a catheter, if necessary, will suffice to establish that in reality the urinary secretion is markedly decreased.

When clinically demonstrated, oliguria and anuria offer a very serious prognosis, and these symptoms during the progress of any form of infection show that the organism has reached an advanced state of failure. Thus, to give a single example, in intestinal obstruction or strangulated hernia, the considerable diminution of the urinary excre-

tion is an absolute indication of reno-stercoræmia, indicating a rapid extension of the infection. It goes without saying that the presence of pathologic elements in any marked quantity, such as sugar or albumin, in a scanty urine darkens the outlook, which will become all the more so in diabetic patients, or those who have been subjects of albuminuria, and who, after a traumatism, require surgical interference after having suddenly ceased to urinate. The only circumstances in which the gravity of the prognosis of arrest of the urinary secretion are mitigated is when it is possible to explain the anuria by a reflex renorenal action set up by the existence of a localised affection of the region, such, for example, as anuria originating from a calculus.

One thing more which is very important is the age of the patient. In young subjects these profound disturbances of the renal function may be due to an acute nephritis, in which case the prognosis is far better. In elderly people it is frequently a sign of chronic old nephritis, the long standing and irreparable lesions of which considerably increase the actual danger. Generally speaking, oliguria and anuria indicate that the patient is a *noli me tangere*, and, consequently, should not be interfered with surgically; and when in spite of massive injections of normal salt solution these symptoms nevertheless persist, one can no longer be in doubt as to the early arrival of a fatal issue. One may consider himself fortunate if this timid therapeutic tentative does not contribute to hasten the final outcome, because it is in just these cases, where the renal secretion has become definitely stopped, that the terrible complication—acute pulmonary œdema—results from the hypodermoclysis, and carries off the patient. Without any doubt many very precious hints would be obtained by careful analysis of the urine, but this necessitates complicated techniques which cannot be thought of in these cases where the life of the human being always depends on the rapidity with which a decision is made.

The nervous system holds two functions under its control whose study presents a very great interest in patients supposed to be dying—namely, the sensibility and motor functions. We have already said a few words relative to the subject of sensibility when speaking of the common condition of indifference preceding the final period of dissolution. It is one of the constituting elements of collapse, but it is not an absolute one, because, beside the category of prostrated moribunds, we have what may be termed the combative ones. In the latter class the exalted sensibility causes the approach of death to be still more painful; unconsciousness and muscular resolution give way to a fearful agitation. In their movements, which are simply gesticulations of revolt against suffering, in their râles, which are cries of pain and of powerless rage, one assists at all the horror of a fierce combat against the cruel adversary whose victory is absolutely assured.

As to the persistence of the motor functions it is occasionally made evident by a jest effected with a remarkable automatism, and here we have a very important sign of an approaching death. In this movement, which is designated by the name of carphology, the subject looks as if he were gathering together a number of scattered objects; sometimes it is the bed clothing which he throws off and pulls back alternately and incessantly with a mechanical regularity in some instances, and in the male only do we meet with carphology of the penis, which has nothing in common with an aberration of the genetic sense, which has been abolished for a long time.

In order to complete the subject of the condition of the nervous system in the dying it would be interesting to analyse their mental condition, but such a psychological study would take us too far from the domain of surgery. What a source of precious indications it gives for the practitioner habituated to read the mind of his patients, and when the prognosis remains in doubt, in spite of the information acquired by clinical investigation, with what a singular privilege of foresight the patient emits the

affirmation that his death is near—perhaps only within a minute or two before the words become frozen on his lips, which are closed for ever!

While endeavouring to form a prognosis and make a decision after the signs that have already been studied, the surgeon should resort to considerations of a more general order, but which are not without considerable interest. A rapid examination will, in the first place, indicate the patient's age, temperament and social condition, and these observations have certainly much importance. It is a very ordinary fact, but one which cannot be too often repeated, because it is a useful truth, that a young and robust subject, who has never suffered physically or morally from the vicissitudes of life, presents guarantees of resistance which are not to be expected in an individual advanced in age, debilitated and worn out by social and physiological misery. Although perhaps elementary, these considerations will nevertheless weigh in one of the plates of the balance for or against, and in some cases, joined to the weight of more decisive arguments, they will suffice to make the balance weigh in a positive or negative sense.

But here come other preoccupations to the mind of the surgeon which relate to the constitutional make-up of his patient. Diseases and accidents which may require an imperative operation do not exclusively strike individuals who were valid and in good health before. They may strike individuals who, for a more or less considerable length of time, have been affected by diathetic affections, such as tuberculosis, syphilis, diabetes, neoplasms, &c., and who may be more or less undermined by their diathesis, or have even arrived at the stage of cachexia. And, still more, these very diatheses may be the determining or complimentary cause of the lesion which gives rise to the question of an operation. In 1880 Verneuil thus posed the question before the International Congress of Medical Science, held at Amsterdam, as follows:—"Le praticien devra-t-il considerer toutes les maladies constitutionnelles

comme des contre-indications à l'emploi de la thérapeutique opératoire? Ira-t-il refuser à tous les diathésiques les bienfaits de la chirurgie armée? Laissera-t-il un scrofuleux s'épuiser par l'abondance de la suppuration? N'ouvrira-t-il pas l'abcès d'un rhumatisant, et ne lébridera-t-il pas l'anthrax d'un diabétique? Renoncera-t-il à prévenir, par une extirpation précoce et largement faite, la généralisation probable d'un néoplasme? Laissera-t-il suivre tranquillement sa marche à la septicémie aiguë, née à la suite de l'écrasement d'un membre? Se croisera-t-il les bras devant l'étranglement herniaire, les hémorrhagies, les rétentions, en un mot, devant tous les cas d'urgence, qui, aussi bien que les gens robustes, atteignent les invalides, quelquefois même les cachectiques?"

Let us now see what solutions he gives to the problem in his conclusions:—

"1. Les opérations chirurgicales ne sont point formellement contre-indiquées, chez les sujets atteints de maladies constitutionnelles; elles sont même, dans ces conditions, souvent permises, fréquemment utiles, parfois indispensables.

"2. Leur pronostic, toutefois, est beaucoup plus sérieux que chez les individus sains; il est surtout plus incertain, plus difficile à établir, rien ne pouvant faire prévoir sûrement à l'avance l'influence favorable ou l'influence nocive que le traumatisme exerce sur la maladie générale, pas plus que la manière, dont cette maladie, à son tour, réagira sur le processus réparateur local.

"3. Ce pronostic diffère pour les différentes maladies constitutionnelles.

"4. Le danger inhérent à la diathèse est minime, quand celle-ci est encore à l'état de dyscrasie; il augmente notablement, quand apparaissent des lésions chimiquement et histologiquement appréciables; il devient extrême, quand les grands viscères, foie, rate, rein, cœur, poumon, présentent des lésions avancées, sclérose, stéatose phlogose, ou, lorsqu'ils sont envahis par des produits patho-

logiques spéciaux à certains états diathésiques : tubercules, gommes, carcinomes et néoplasmes divers."

From this it becomes evident that nearly twenty-five years ago Verneuil already admitted that the diatheses which have arrived at the dyscrasic state are in no way contra-indications for surgical interferences, but he becomes more reserved when the lesions are histologically appreciable, and decides not to intervene when the specific pathologic productions have invaded the large viscera. The progress of science, however, has allowed surgeons to enter into a domain that Verneuil only timidly penetrated, although he was fully aware what successes might be met with in operations upon diathetic subjects, as, for example, surgical interference in diabetic individuals, when a careful asepsis closes the door to secondary infections.

In point of fact the term diathesis is merely a word which has for a long time been employed and abused for the purpose of sowing fear in the surgical mind. Every day one finds the same label of syphilitic diathesis applied, for example, to two subjects—one of whom comes and goes like everybody else without the slightest accident or functional disturbance; while the other shows by the inco-ordination of his movements and disturbances of the sensibility, his medullary lesion, or by his progressive cachexia and marked ascites, his specific hepatic insufficiency. In both of them the same word is used for indicating the affection, only in one the word alone exists for the time being, while in the other a fact becomes added—that of a serious lesion. We are, consequently, far from the timid conclusions offered by Verneuil, who admitted that visceral lesions rendered the prognosis which was already unfavourable far more serious. At the present time it may be said that the diathesis in itself is nothing, and that it is the lesion alone which creates the danger. In considering the general condition of the patient the surgeon, eliminating the diathetic affection, should be more pre-occupied with the lesions that it has produced in the large

organs and the visceral insufficiencies that it favours. It is not tuberculosis, diabetes, or syphilis, the obscure and hypothetical consequence of which should be thought of, but it is the condition of the heart, liver, kidneys, and lungs, each considered in itself and independently of general causes which have acted upon them, that will serve as a base upon which to form a prognosis and guide the decision as to the advisableness of operating.

Another factor comes into play here—namely, the condition of the principal viscera—but it has not the same importance as the foregoing conditions. In the strict point of view of their functional importance the only one which need be considered at present is whether or not fundamental differences exist. The different functions have not all an equal importance, and there are some which may become suspended for a certain time, and the patient will continue to live, but there are others whose complete and instantaneous arrest will, necessarily, result in death. Such, for example, is the circulation. Consequently, we would give the heart the foremost place. It is not a question here of its functional cessation which implies that death has occurred, but of a more or less marked weakness in its functional activity. No matter what various lesions may compromise its mechanism, they darken considerably the prognosis. When arrived at an advanced stage, when they have acted upon the other viscera, and when the disturbances that they bring about have resulted in a pulmonary, renal, or hepatic insufficiency, they at once become a distinct contra-indication for operation.

The condition of the liver, kidneys, and lungs still remains to be considered, and which of these different organs, whose absolute or relative integrity is the most important, and whose functional disturbance is the most to be feared, is a very complicated and difficult question, to which I can only briefly refer because it presents so many different aspects. There is in the first place one consideration which is simply common sense: while the

kidneys and the lungs are double organs, one of which may supply the functional insufficiency of the other, the liver is, on the contrary, a single organ, and those affections which bring about its total functional incapacity cause a complete suppression of physiological activity. As to the kidneys and lungs it is impossible to discuss the question of their priority from the standpoint of the relative importance of their integrity. To do this it would be necessary to enter into a long discussion of statistical considerations, pathological anatomy, and clinical medicine which would take too long to set forth and argue. Then, again, this is a question of secondary importance; but what is important to consider in a case of extreme urgency is to know whether there exists or not a contra-indication due to some pathological state of the kidneys or the lungs. Upon this point it is quite impossible to lay down any hard and fast rule. One should be particular to discover if the way in which these viscera fulfil their functions is sufficient to uphold the vital resistance to a certain point. In the case of the kidney this is easily ascertained, because a quantitative examination of the urine, and, to a certain extent, a qualitative one, will give sufficiently precise data. For the lungs the question is more delicate. Auscultation and a careful examination of the patient will nevertheless furnish some very precious signs which will reveal the manner in which the respiratory phenomena are being accomplished, and whether or not they are compatible with chances of survival and the possibility of operating.

Let us suppose that after a careful examination, and after having minutely weighed the "pros" and "cons," it is decided to operate, how and to what extent shall the operation be done? Here one is in the presence of an individual seriously afflicted by some infectious process, extremely weakened by loss of blood, violently shaken by nervous commotion, or arrived at the extreme limit of a suppurative cachexia; these are certainly conditions which differ from usual circumstances, and which also

differ from the ordinary from a therapeutic standpoint. The first indication which imposes itself is to reduce the narcosis to the very shortest possible time, or even to do without it altogether, if possible. In point of fact general narcosis amounts to an intoxication, occasionally necessary, but always more or less injurious no matter what agent may be employed. There are cases where the condition of indifference and extreme insensibility of the subject allows the operation to be performed without the use of any anæsthetic, and one will hardly note any movement of the face or jerks of the limbs indicating the weak persistency of sub-conscious reflex sensibility. In other cases pathological anæsthesia is not sufficiently complete, and the patient will react quite sharply to external excitations, so that he will be fully conscious of pain. On the other hand, his vital resistance is so precarious and compromised that it would be quite unsafe to submit him to the influence of a general anæsthetic. Under these circumstances local anæsthesia by injections of cocaïn will be quite sufficient in the larger number of instances, because usually the operations in this class of case are both simple and rapid.

Lastly, in rarer cases, where the general sensibility has remained intact, and where the patient seems in sufficiently good condition to be able to withstand general narcosis, this should be resorted to; but its duration should be made as short as possible in order to diminish its bad effects on an organism which is in a condition of lessened resistance. I cannot believe that the use of spinal anæsthesia with cocaïn is a wise practice, at least in these cases. Its results and ultimate consequences are not sufficiently known in order to conclude as to its absolute or relative superiority to narcoses obtained by the use of chloroform or ether. The two latter agents are by far the most frequently resorted to.

In order to make the duration of the narcosis as short as possible the patient should not be submitted to the anæsthetic until all preparations for the operation have

been carried out and the surgeon and assistants are prepared. During the anæsthesia the pulse should be carefully watched, and if it weakens or becomes slow the anæsthetic should be stopped or prudently administered, because the effects, always serious, of toxic syncope are all the more to be feared under these circumstances, since the general condition is more precarious and the vital resistance is lessened.

I cannot leave this question of general anæsthesia in imperative surgery without saying a word relative to the choice of the agent. It would seem that preference should be given to ether, because it has over chloroform the advantages which will be seen in comparing the following tables:—

ETHER.

Moderator and tonic of the heart.

Arrest of respiration before that of the heart.

Does not increase the loss of nitrogen.

Hardly ever induces syncope at the beginning.

May be given in relatively large doses.

CHLOROFORM.

Paralyses the heart.

Suddenly arrests the heart.

Increases the loss of nitrogen.

Produces it often.

Can only be given drop by drop.

From these considerations it would seem to result that ether is a less powerful factor of shock than chloroform, and consequently it should be used in preference to the latter. The presence of an open fire or numerous gas jets in a small room seem to be the only contra-indications for the exhibition of ether. After several years' use of ethyl-chloride as a general anæsthetic to induce primary narcosis before giving ether, and used in every imaginable class of case from infancy up to old age, I can most highly commend its use, because its action is rapid, and those who have administered this drug for me in my operations,

and who are most thoroughly competent in the matter of anæsthesia, have assured me that about one-half less ether is used during the narcosis when ethyl-chloride is employed. The induction of primary anæsthesia with nitrous oxide does not appeal to me, and in imperative surgery it is out of the question unless in a hospital, on account of the enormous bulk of the required apparatus. With ethyl-chloride we have never observed a single untoward effect, the pulse and respiration remaining perfectly normal, and the average time of complete narcosis has been about fifty seconds in adults and thirty in babies and young children.

The necessity of restricting the time of the anæsthesia brings us to another point—namely, to act rapidly and, consequently, simply; in other words, to limit the operation to those manœuvres which are strictly necessary to ward off the immediate danger, while further work for complete cure of the patient may be achieved later when the general condition will allow of a more prolonged and perfect secondary interference. One should not lose sight of the fact that, independently of the reasons given above, operative shock is partly a function of the duration of the interference, and that, in spite of the most careful hæmostasis, loss of blood will only be increased by long and complicated manœuvres, and that, lastly, the more an operation is prolonged the more the patient is exposed to secondary infection, against which the most careful asepsis does not always afford a guarantee. To open up and clean out hæmorrhagic or purulent foci, to ligate injured vessels, suture ruptured organs, remove, when it can be easily and quickly done, the diseased structures, freely irrigate and drain septic cavities—such are in a summary way the general indications to be fulfilled. No search should be made for an appendix which cannot be immediately found, no immediate and complicated amputation in major traumatism of the limbs, enterostomy and not resection in intestinal occlusions, the liberation without excision of the sac and reconstructing the canal in cases

of strangulated hernia, are things which should be done if one is desirous of being a successful scientific surgeon, and not merely an operator. And in this point of view let me say that the French maxim, "the best is the enemy of good," is absolutely common sense, and most decidedly applies to imperative surgery. If this simple advice is carried out one will more frequently save hopeless cases than otherwise; and sometimes it is astonishing what one may be able to obtain from the mysterious work of nature when he knows how to stimulate her efforts and effects by a properly located incision and good drainage.

In closing, let me say that in emergency surgery, with the patient at the frontiers of death, the free use of normal salt solution should always be resorted to, beginning before, kept up during, and continued after, the operation. In some cases, especially in severe internal or external hæmorrhage, sometimes in traumatic shock or septicæmia, the use of this agent represents the only therapeutic measure to which one can resort, and the success that it will give is sometimes more than favourable.

ART. XXIII.—*Urticaria Pigmentosa*.^a By WALLACE BEATTY, M.D., F.R.C.P.I.; Physician to the Adelaide Hospital, Dublin. [Illustrated.]

THE pathological anatomy of urticaria pigmentosa is very remarkable. This consideration and the rarity of the disease (I have met with only two cases in my hospital practice during the past twenty-four years: a third case Dr. Walter Smith gave me the opportunity of seeing some years ago) have led me to hope that the exhibition of a living specimen and the description of the microscopical appearance of the lesions of this disease found by others, illustrated with microscopical preparations I have made myself, may not be unacceptable to the members of the Academy.

^a Read before the Section of Pathology in the Royal Academy of Medicine in Ireland, on Friday, March 16, 1906.