

MEDICO, SURGICAL SUBQUESTIONS

VOL IX



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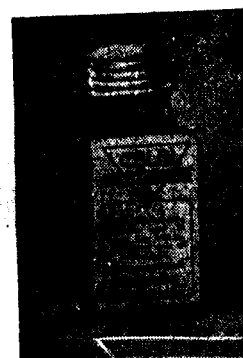
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MEDICO-SURGICAL SUGGESTIONS

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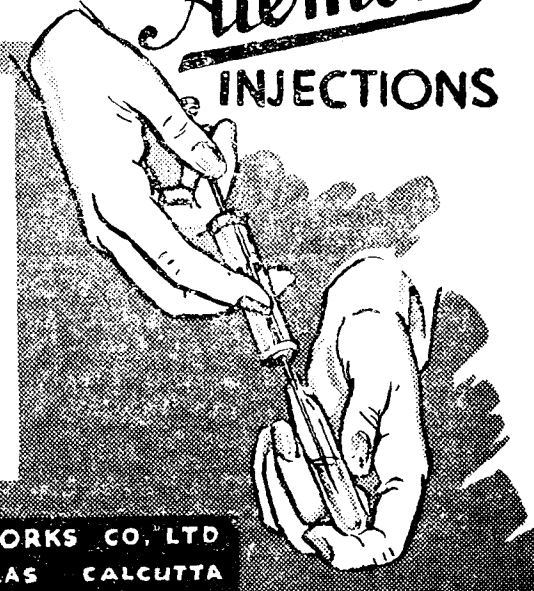
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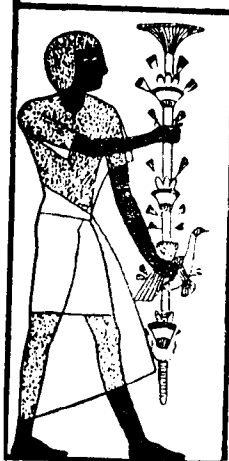
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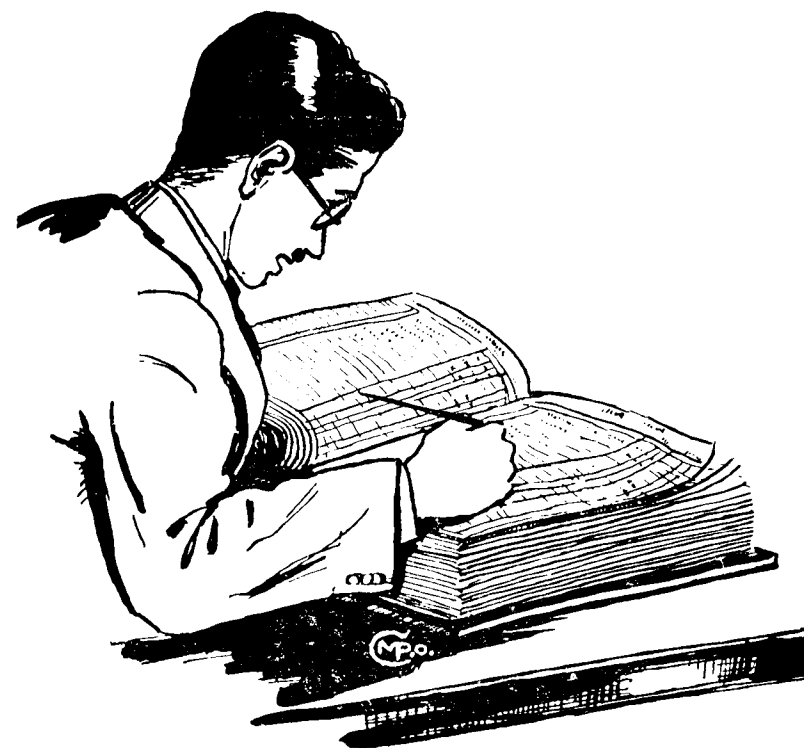
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MEDICO-SURGICAL SUGGESTIONS

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Articles.

HOW CONTAGIOUS DISEASES ARE SPREAD.

ISAAC A. ABT, M.D.

Chicago.

For ages physicians were baffled by the mystery of epidemic diseases, and explanations of the conveyance of these diseases were grotesquely speculative and incorrect. It was only with the advent of the bacteriological discoveries of Pasteur and his students, and Robert Koch and his followers, that the cause, nature and prevention of the communicable diseases could be effectively investigated.

We must briefly inquire how communicable diseases are spread. Everyone knows that healthy individuals may carry pathogenic organisms which may not ordinarily produce disease in the host. *Staphylococcus aureus* and *albus* may be found not only on the skin but also on exposed mucous membranes. Under varying environmental conditions and at different seasons of the year, the organisms of influenza, diphtheria, pneumococci, meningococci and other bacteria may be found in the nose and throat of healthy individuals. These bacteria may remain on the mucous membranes of their host without producing disease, though if transmitted to other individuals, these same bacteria may cause virulent infection. The individual who harbors pathogenic organisms is called a carrier. In the carrier, as has already been indicated, the organisms may be latent, or the carrier himself may be actively ill.

In addition, infections may be soil-borne; the spore-forming organisms are the common offenders here. Tetanus, malignant edema, anthrax and the gas bacillus are the best known of this group. These organisms enter the body through wounds or abrasions and one might speak of the nail or splinter of wood or the wire which produces the trauma and infection as fomites.

Typhoid, paratyphoid, bacillary and amebic dysentery and cholera frequently infect the water supply and may give rise to serious

epidemics. The food supply may be the source of infectious diseases in man. Milk is the medium which sometimes conveys scarlet fever, diphtheria, tuberculosis, typhoid fever, undulant fever, epidemic sore throat, foot and mouth disease and other infection. Oysters may transmit typhoid fever to man, and meats may be the source of paratyphoid fever, botulismus and meat poisoning.

Disease may be transferred to man by animals. Thus, man may acquire glanders from the horse, anthrax from cattle and sheep, hydrophobia from dogs, and insects may carry disease from man to man. Flies or other insects may infect foods with typhoid. Insects transmit disease in various ways; thus, the flea transmits the plague bacillus from rat to man, and the louse spreads the virus of typhus from one human being to another. The anopheles mosquito transmits malaria, and the stegomyia fasciata transmits the virus of yellow fever. Rocky Mountain spotted fever is transmitted by a tick, *Dermacentor venustus*, which contains a minute intracellular, intranuclear bacterium-like organism.

We may best illustrate the mode of communication of contagious diseases by considering a few typical disease groups:

PNEUMOCOCCUS PNEUMONIA.

Pneumonia ordinarily is not an epidemic disease, unless it occurs secondarily to outbreaks of influenza or measles. Pneumococci of varying types and degrees of virulence may have their habitat in the throat and saliva of normal individuals, though recent studies indicate that some of the more common and virulent types of pneumococci rarely occur in the oral cavity except in patients convalescent from pneumonia, or carriers who have been directly exposed to the disease. Healthy pneumococcus carriers may convey the organisms to other healthy persons, thus establishing another group of healthy carriers. The pneumococcus does not long survive outside the body; it is rapidly destroyed by sunlight, by treatment with ordinary disinfectants and by heat, though it may survive in sputum. If the expectorated material is kept moist in the dark and at room temperature, it may remain viable for several days. Convalescent carriers may continue to be infective for days, weeks, or months after the subsidence of the disease.

W. G. Smillie (Am. J. Pub. Health, 1938) studied Type I pneumococcus infections at the State Hospital in Worcester, Mass. He found that type I pneumococcus carriers became widely distributed throughout the main hospital, and from his observations he was forced to conclude that these carriers and not the actual cases of pneumonia were responsible for the spread of the infection. Inmates of the main hospital who were transferred to another building and who proved to be carriers of Type I pneumococci infected a number of inmates who had not been previously exposed, thus causing a new outbreak.

The pneumococcus is contained in the bronchial and buccal secretions, and by coughing or sneezing the organisms may be rapidly sprayed into the air and into bedding, furniture and other objects in the sickroom. It was long ago shown by Flugge that the spray emitted by coughing contained specific organisms, and Pasteur and Tyndall thought that dust was capable of sustaining and conveying pathogenic organisms. Pneumococcus lobar pneumonia, then, may be considered an example of infectious disease of known specific origin, which is transmitted either by a healthy carrier or by one who is actively sick with the disease.

There are other factors to be considered in ascertaining the cause of pneumonia. It occurs most frequently during the colder portion of the year when the patient is subjected to overcrowding in the home, and the amount of fresh air is diminished. The home, the office, the railroad coach, as well as theaters and meeting places, are less well ventilated than in the warmer parts of the year. In an overcrowded room the occupants are brought more closely together, and the danger of contact infections of all kinds is increased. Crowded and badly ventilated schoolrooms, infant asylums, hospitals and homes are places for frequent recurring infections, especially during the periods when doors and windows are closed and sealed. The incidence of disease which results from crowding Finkestein has termed "the lowered resistance of overdomestication." He also observed that infants and children who are in an excellent state of nutrition, who are not suffering from rickets or other avitaminoses, have a higher degree of immunity against grippal infections than malnourished children.

The other factors such as exposure to cold, wind, changes in humidity, diminished sunlight and atmospheric conditions in general may exert an influence on the resistance of the patient, the virulence of the organisms and on the patients' nutrition. Many of these speculative topics have been studied since the days of Hippocrates until the present time without any definite solution as to their significance, save that we have learned the importance of sunlight and fresh air in conserving normal health and nutrition.

DIPHTHERIA.

Diphtheria, a well-known disease of specific origin, will interest us as another example of communicable disease. The diphtheria bacillus may be found in the nasopharyngeal or pharyngeal mucosa of healthy individuals. The specific organism of the disease enters through the oral or nasal cavities and the organisms leave the body through the discharge from mouth, nose, or possibly in the pus from a running ear.

Diphtheria is, for the most part, a contact infection. It is usually acquired from another person who is actively ill, or from one who is a carrier. Occasionally, the disease may be conveyed by

substances (so-called fomites) which have been contaminated by the patient or the carrier. The disease may also be transmitted through milk, in which medium the organism grows well, and several outbreaks due to this cause have been reported. The droplet infection of Flugge may occur, but the radius of its spread is not supposed to be far removed from the patient.

It is still within the memory of some of us that diphtheria would invade a household and at one time a whole family of children would be wiped out by the disease. It was also the bane of children's hospitals and wards; outbreaks were frequent and uncontrollable, in spite of all known precautions. The disease is so easily communicated by direct contact and droplet infection, and by contamination of food and fomites, that all known methods of prevention were futile, until fortunately specific serum treatment and immunization were discovered.

MEASLES.

Measles may be considered as an illustration of a widespread, rapidly diffusible, epidemic disease. The natural immunity of an individual to measles is very slight. It is readily communicable and attacks nearly all children who are exposed; in this respect it resembles smallpox and pandemic influenza. Measles is considered to belong to the group of virus diseases. The disease is most infectious during the early catarrhal stage. Mouth and nasal secretions during the catarrhal stage are sprayed by coughing and sneezing, and lodge on the mucous membranes of the mouth, nose or eyes, thus spreading the disease among susceptible children. One cannot demonstrate that healthy carriers transmit the disease, and the evidence is all in favor of the infectiousness during the catarrhal stage. The desquamating scales have been shown not to be contagious and do not carry the specific agent of measles.

TYPHOID FEVER.

As a typical example of an enterogenous infection, typhoid fever may be briefly referred to. It has already been mentioned that the disease is contracted by the ingestion of infected drinking water or milk. Patients who are ill with the disease eliminate the organisms through their intestinal tracts, though the urine may also be infected. Persons who continue to eliminate typhoid bacteria through these channels are classed as carriers. It has been estimated that after recovery from typhoid fever, from 1 to 5 per cent of patients remain carriers for a period varying from a few weeks or months to many years.

It should be mentioned that the principal lesions of typhoid fever in infants and children, as well as adults, are located in the intestine. In the fetus, on the contrary, the intestinal lesions of typhoid are not present at autopsy after birth. Intrauterine typhoid is, from the first, a general septicemia. Typhoid bacilli are found in the

blood of the fetus, also in the spleen, in the heart's blood, and in the liver. The fetus usually dies in utero, though rarely the infant is born apparently ill with the disease; or fetal infection may not have occurred at all for some reason, even though the mother may have been acutely ill with typhoid; or the fetus may exhibit a positive Widal reaction after birth without other symptoms of the disease.

SMALLPOX.

Variola was once a very prevalent disease, occurring as frequently then as measles does now, and was more fatal. Smallpox is spread mainly by direct personal contact, and the virus is contained in the skin lesions, though the naso-pharyngeal secretions also contain the virus and are frequent sources of infection. Like measles, smallpox is not transmitted by healthy carriers. It is thought that the disease may be conveyed by fomites, such as infected clothing and letters, especially since the virus is preserved by drying. It is possible that flies may transmit smallpox; if they light on the body of a patient, they may spread the disease to susceptible persons.

INFLUENZA.

The cause of influenza has not been definitely determined. It may occur in isolated cases in epidemic or pandemic form. Pfeiffer's bacillus, which was at one time considered the specific cause of the disease, has in more recent times been considered as a secondary invader, and the tendency has been to regard influenza as due to a virus. The virus may prepare the soil for Pfeiffer's bacillus, pneumococci, and other invaders.

The virus is contained in the secretions from the mouth and nose, and the infection enters in the same way. Thus, it is obvious that the virus may be transmitted directly from one person to another, or by infected air and dust, or through droplet infection. Water, milk, and food may carry the virus. The spread of influenza, like measles and smallpox, is not checked by improved hygiene or sanitation.

Pandemics of influenza spread from country to country, causing a high morbidity. The disease spreads with great rapidity. It is highly communicable, and the majority of the population is susceptible to the infection. The incubation period is short, lasting about two days. The transmission of the infection takes place during the early period of the disease, probably during the two-day incubation period. It has been estimated that in the 1918 influenza epidemic, there were approximately 550,000 deaths from the disease in the United States.

The infection declines rapidly in a district after several weeks' duration. Epidemiological studies seem to indicate that the rapid spread of the disease is independent of climate, social conditions, age, sex or occupation of the individual attacked. The world-wide propagation of this epidemic disorder still continues to mystify physicians and investigators, as it did centuries ago.

A number of explanations have been suggested, though their validity requires further proof. It was thought that in recent epidemics the disease originated in the eastern world and spread rapidly over the globe. During the 1918 pandemic it was assumed that a large part of the population was susceptible to the infection; if in such a community a virulent strain of influenza virus is introduced, the distribution of the infection takes place rapidly and droplet infection from those who are attacked increases the incidence of the disease.

Jochmann (*Lehrbuch der infectionskrankheiten* 1914) relates the story of the ship "St. Germain" which left the port of St. Nazaire on the 2nd of December during the 1889 influenza epidemic. On the 5th of December passengers and crew were all in excellent health, and the ship lay to on the Spanish coast to take on a passenger from Madrid where the epidemic was at its height. Four days later the passengers began to succumb to the disease, so that out of 436 travelers, 154 were ill with influenza, in addition to forty-seven sailors.

TRANSMISSION IN HOSPITALS.

Infections and cross infections in hospitals, particularly in infant and children's wards, as well as in contagious hospitals, offer us a suitable theme for the further consideration of our subject. The study of hospital epidemics was given a new impetus through the opening of the Pasteur Hospital for Infectious Diseases in Paris in 1900. The management started with the assumption that airborne infection is of no importance in clean and sanitary buildings, and that contact infection causes the spread of the disease and can be prevented by the proper technic. Patients ill with all kinds of contagious diseases were sent into this hospital, and were isolated in cubicles. Trained nurses under the supervision of a carefully selected medical staff succeeded in preventing, for the most part at least, cross infections.

Charles V. Chapin of the Providence (R. I.) City Hospital established a similar routine in his wards. He believed that air-borne infections were a myth, and he equipped each ward or room with a lavatory, insisting that the nurse wash her hands with soap and water after each contact with the sick. The nurse wore a separate gown for each patient before going to the bedside, and each bed was supplied with individual belongings, such as thermometer, urinal, basins, ice bag, and everything necessary for comfort. Dishes and utensils were put directly into sterilizer and rubber goods, bedpans, and urinals were disinfected in a 1-20 carbolic solution. Chapin did not use the so-called frills like caps, rubber shoes, gloves, hand disinfectants and fumigation. He insisted on simple cleanliness. He thought that if student nurses were employed, errors in technic and infections were bound to occur.

Chapin thought that most pathogenic organisms speedily died and became innocuous if exposed to the air, so that little harm was to be feared from the dust. He held that the common contagious diseases are spread chiefly by the transfer of fresh infective material from person to person. Saliva and other body fluids, and human excrement, smeared on the fingers, and on countless objects which pass freely from hand to hand and from hand to mouth, were considered the primary sources of infection. This aseptic technic had an immeasurable influence on the prevention of infection and cross infection in the hospital.

More recently, however, renewed thought has been given to air-borne infection. In many well conducted children's hospitals under the best management the aseptic nursing technic has been perfected, so that little is left to be desired in this direction. Nevertheless, infections or cross infections have periodically occurred, in spite of precautions.

Increasing experience seems to indicate that air-borne infections do occur in hospitals. Chickenpox, common colds, influenza, and measles may spread in spite of the most careful aseptic technic. Partly closed cubicles frequently prove inadequate to prevent cross infections. W. F. Wells, who has contributed valuable information on this subject, has shown that droplets sprayed from the nose and throat are not deposited on the floor in the immediate proximity of the patient, but they may dry and become what Wells terms "droplet nuclei," and remain floating in the air for hours. The microorganisms remain viable in these nuclei for considerable periods. Wells learned from his studies that hospital air carries a bacterial load enormously in excess of the air outside the hospital. He found that it is possible to reduce the bacterial content of the air by the introduction of ultraviolet radiation, and at the same time improve ventilation.

Charles F. McKhann of the Children's Hospital, Boston, constructed a barrier of ultraviolet irradiation, which was stretched across a corridor in order to eliminate if possible the transmission of the chickenpox virus through the air. McKhann found that the lamps sterilized the air near the patients but did not affect the air similarly at a distance from the patient. The lamps had to be placed in such a position that the radiation did not reach the eyes of the patient. McKhann achieved partial success in suppressing the communicability of chickenpox, though he remarks that sterilization of the air may minimize infection but can not eliminate the element of human error - namely, the transmission of organisms on the clothes, on the hands, or in the naso-pharyngeal secretion of the attendants.

At the Cradle, a small orphanage for young infants awaiting adoption, which is located in Evanston near Chicago, the most careful aseptic nursing technic has been instituted and, in addition, tests

of the efficiency of air disinfection by ultraviolet radiation are being conducted.

Perhaps some of the unexplained respiratory and intestinal infections in newborn nurseries that have been so mysterious in their onset may at times be due to air borne infections, instead of errors in aseptic technic. Perhaps these newer studies will show that air-borne infection plays a greater part in the transmission of communicable disease than has been previously supposed.

(*Rocky Mountain Medical Journal*, Dec. 1939.)

COLLAPSE THERAPY IN TUBERCULOSIS.

VICTOR STRONG RANDOLPH, M. D.

Phoenix, Arizona

Collapse therapy is so necessary in the treatment of tuberculosis that no one nowadays can undertake to advise and follow a case without knowing at least some phases of it. At the present time there is probably no physician who is treating tuberculosis from a strictly medical standpoint, with the exception of those who are purely consultants.

One who is engaged in active treatment of tuberculosis will follow the old and proven procedure of putting his patients to bed. However, in a large percentage of his patients he will soon decide to use the simplest form of lung collapse, artificial pneumothorax. This method of collapsing the diseased lung was first introduced into this country by the surgeon, John B. Murphy, but has gradually come to be used by medical men everywhere, and properly so. I feel that artificial pneumothorax should be attempted in every patient who shows cavitation in one lung or in both lungs provided the degree of involvement is not so great as to have reduced the vital capacity below the limit needed for life. It is remarkable how little visible lung space as shown by the x-ray is necessary to maintain life. In addition to those patients who have cavities artificial pneumothorax should be considered as treatment for the patient who fails to improve after a reasonable time in bed. I should not delay more than two or three months before starting pneumothorax even in a patient without cavities, who did not show definite improvement. Some men consider that pneumothorax should be used in every case, even those with minimal tuberculosis. Certainly it is true that we have in pneumothorax a method of healing the lung so thoroughly that often it is impossible to tell on x-ray films made after the lung has been re-expanded which of the two lungs had been collapsed. Artificial pneumothorax, even when complete and uncomplicated, has failures, but these are exceedingly rare.

PHRENIC NERVE SURGERY

Some men who are adept in the treatment of tuberculosis prefer as the first step a phrenic nerve operation to pneumothorax, particularly in a patient with a one-sided tuberculosis who has not a cavity, but who does not improve on bed rest. My own preference is for pneumothorax for the reason that paralysis of the diaphragm is a passive mode of treatment and for the reason that it takes some time to determine whether the paralysis will succeed in curing the disease. If it does not succeed then pneumothorax must be used. This is an active method of treatment and I would prefer using it first rather than withholding it. Adhesions may form and prevent pneumothorax if it is withheld too long. In case artificial pneumothorax is entirely unsuccessful because of the presence of diffuse adhesions about the lung and inability to get air into the chest, the phrenic nerve operation is advisable in a unilateral case without delay. The phrenic nerve and accessory nerves which may be present should be crushed rather than cut or removed. A few years ago we removed many nerves and I am sure we did harm by destroying permanently the function of the diaphragm. This is particularly true in patients whose principal disease is in the upper part of the lung. Some of these patients at least will fail to recover from use of the phrenic paralysis alone and will later need thoracoplasty. If the disease is limited to the upper part of the chest collapse of the diseased area by a partial thoracoplasty may be successful, but the remainder of the patient's lung will be of little use to him unless he has the function of the diaphragm. However, if the patient's disease is predominant in the lower part of the lung it may be that a permanent paralysis of the diaphragm will be advisable. It is perhaps advisable first, however, to crush the nerve. This allows the paralysis to recover after an interval of six to eight or ten months as a rule, and crushing may be done again at that time, or a permanent paralysis established by cutting the nerve or removing it. The nerve may be crushed more than once if desired. We have occasionally seen remarkable closure of cavities in the upper part of the lung following removal of the nerve. But in most of these cases I believe that cavity has recurred after a lapse of one to three or four years. Occasionally paralysis of the diaphragm may be useful in association with artificial pneumothorax. I have used it in some patients who had disease of the lower lung, successfully and Dr. Phillips has reported that some patients who had incomplete pneumothorax because of pleural adhesions secured closure of their cavities when we had done a phrenic nerve operation.

PNEUMOTHORAX

We come to pneumothorax again. Matson, in a large series of pneumothorax cases has estimated that about 20 per cent of the patients has diffuse adhesions, permitting no air to be put into the

pleural cavity. About two-fifths he found to be relatively free of adhesions. In about two-fifths of the cases he found that adhesions prevented sufficient collapse of the lung to permit closure of the cavity. In at least one-third of these cases with adhesions successful pneumothorax may be established by the cutting of adhesions. Adhesions may be cut with cautery or with galvanocautery, either by opening the chest and working under direct vision or by the intrapleural closed method of Jacobaeus. In my opinion the latter method is safer and causes the patient less discomfort. The number operated by the open method so far has not been large, but in the hands of several operators has been successful. In my own cases and in numerous series that I have reviewed the percentage of successful closed operations has been about 70. It is advisable to look into every chest that offers any possibility of cutting the adhesions. In determining the operability of a case we cannot depend entirely on the x-ray picture of the chest. These do not clearly show the extent of adhesions. Many small adhesions which are present do not appear on the x-ray films. On the other hand, occasionally the x-ray films may cause an adhesion to appear too large to operate upon when, as a matter of fact, on inspection it is found to be readily cut. For such inspection of the chest the closed method is preferable. In many cases we have cut adhesions in both sides of the chest when we were carrying on a bilateral artificial pneumothorax. This operation is indispensable in collapsing both sides of the chest, for it allows us to bring about a collapse of the affected parts of both lungs and avoids the necessity of collapsing more of the lung than is involved in the disease process.

THORACOPLASTY

If pneumothorax is impossible because of adhesions, and the patient does not improve on bed rest and the use of paralysis of the diaphragm, we must consider collapse of the lung by means of removal of the ribs. This is always true when large cavities are present and should not be deferred when the cavities present are small. Occasionally a patient with very small scattered cavities must be submitted to thoracoplasty. A few years ago the majority of patients we saw were obliged to have practically all of the ribs removed because of extensive disease. In recent years we are seeing patients for thoracoplasty at an earlier stage in the disease. The majority have upper lobe lesions. These patients can be treated with partial thoracoplasty, usually the removal of five to seven ribs, and a portion of the lung can be saved for future use. Upper thoracoplasty may be done on both sides of the chest. I have two patients at least in whom a four-rib thoracoplasty has closed the cavity. Unfortunately, a mere section of ribs is not sufficient. We have found that each case must be carefully studied and all the rib structure enclosing or encroaching on cavity or cavities or diseased

lung must be removed. In addition we must in many cases take also transverse processes of the spine and the costal cartilages. The diseased lung has a remarkable property of collapse by atelectasis. It is held firmly to the ribs by pleural adhesions. When the ribs are removed the chest wall is allowed to fall in. The lung contracts and small cavities are closed. If cavities are large the walls may be composed of rather stiff fibrous tissue and these cavities may need external pressure after the ribs have been removed in order to bring about closure. In many of our cases a few years ago, after the removal of ribs cut at the spine, we found that a cavity at the apex would contract into the neighborhood of the upper mediastinum. Here it was protected by the transverse processes of the spine and no pressure would close it. Therefore, it is customary now in a case of large cavities to remove a portion of the spine and also to carry the rib resection toward the front as far as the border of the sternum. In this way the maximum collapse is obtained.

Even with this complete removal of ribs we sometimes see a remnant of cavity remaining at the edge of the mediastinum. To combat this failure operators are now freeing the lung entirely from the apical attachments at the time of operation and so collapsing it from the apex downward. The lung is attached at the apex to the spine and, though the periosteum of the first and second ribs, to the scalenus muscles. These prevent the very top of the lung from collapsing downward at the time of thoracoplasty. The effect then of removal of the ribs is to permit an inward, horizontal collapse. By freeing the lung it is possible to obtain also a downward, vertical collapse of the apex of the lung as low as the fourth or fifth vertebrae. When this is successfully done residual mediastinal cavities are prevented. This particular operation is dangerous because the lung must be stripped not only from the attachments at the apex but must be separated from the mediastinum and there are large vessels which can be perforated. One operator of wide experience told me recently that he felt this procedure was too dangerous. However, others have told me they think it can be done with care. It is my opinion that this particular procedure is of great value and will be found to produce more uniformly good results in thoracoplasty operations than we have had heretofore.

Thoracoplasty is of course, a serious operation, but with modern methods of handling patients, the percentage of operative mortality has been reduced very much. I believe we can safely say that the risk is no greater than that of a major abdominal operation where the surgeon often has also to deal with a patient in subnormal condition.

The chief safety factor perhaps is the ability that has been gained to estimate a patient's condition for operation and the needed preoperative care or treatment and the needed preoperative care.

Not less important is the estimation of how much one may do at a given operation. It was customary as late as four or five years ago to cut five or six ribs at one operation. The patient nearly always went into shock. At the present time we take two or three and never more than four ribs, and even as little as one rib. The next safety factor is the spacing of successive operations. In other years we did not dare wait more than two or three weeks usually between operations because of the fact that the periosteum would have time to regenerate and form new bone, which would prevent the maximum desired collapse if these new bones were not removed.

It has been found possible by treating the periosteum at the time of operation with formalin or with some other chemical, or by using actual cautery, to prevent the regeneration of ribs, and the operations can be spaced farther apart so that the patient can have opportunity to recover from one operation before another is undertaken. If the apex is fully freed as previously suggested it is customary to remove the periosteum together with the intercostal bundles and this allows one to wait as long as may be required before going ahead. The selection of cases for operation is of course important, but unfortunately the thoracic surgeon cannot refuse operation to the patient whose condition cannot be otherwise improved, if, as is often the case, it is the only means through which some relief may be afforded.

OTHER METHODS OF COLLAPSE.

Some other procedures than those discussed have been used as lung collapse measures. Cutting the scalene muscles or scalenotomy allows the first and second ribs to fall downward and compress somewhat the apex of the lung. This may conceivably close a small apical cavity without resorting to thoracoplasty. Section of all or most of the intercostal nerves to stop motion of the chest wall has been used in a few cases and is of some value in preparing the patient for thoracoplasty. Extrapleural freeing of the lung from the ribs, collapse of the diseased lung by manual pressure and insertion of a pack extrapleurally to keep the lung collapsed may occasionally be of value in my experience. This method had a very wide vogue some years ago because of the fact that it was less dangerous than thoracoplasty. However, our experience has shown that the final results from use of the extrapleural pack are not comparable in any way to thoracoplasty.

In one case cavity drainage was useful in preparing a patient during some months for thoracoplasty.

An operation not as yet of general use is that of lobectomy or pneumonectomy. This is never the operation of choice because the wound and pleura always become infected with tubercle bacilli which will be difficult to control. Thoracoplasty must be performed subsequently, in many cases at least, and unless some form of

overcoming the infection is discovered this operation will not be generally favored. Lobectomy and pneumonectomy have been performed less often for tuberculosis than for carcinoma.

SUMMARY.

Collapse therapy in tuberculosis may not be limited to any one procedure. Each patient is an individual case and must be treated according to the indications which present themselves. One form of collapse may be indicated first, then other forms may be used as the case progresses until the active tuberculous tissue has been collapsed. When this has been accomplished by mechanical means the patient is not yet well, but must continue under medical observation until nature has been able finally to heal the affected areas.

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THE EXAMINATION OF THE RECTUM

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Osler once said that the difference between a good doctor and a bad doctor was that the good doctor examined the rectum. Examination of the rectum may be called for, first because the history of the case points to a pathological condition in the rectum or anus, and secondly to find out the condition of organs or structures which may be palpated through the rectal wall. The failure of the clinician to examine the rectum has so frequently lead to disastrous results for his patient and to the complete humiliation of himself; a third reason has been advanced for examining the rectum, namely, to prevent "putting one's foot in it."

A discussion of the examination of the rectum may therefore be considered in two parts:—

(i) The examination of the rectum itself.

(ii) The examination of structures through the rectal wall, or bimanually from the rectum through the abdominal wall (in other words, per rectum).

(1) THE EXAMINATION OF THE RECTUM ITSELF.

The position of the patient.—The common practice of examining the rectum with the patient in the left lateral (Sim's) position has very little to recommend it except that the clinician may use his right index finger to make the examination. In other words, the position of the patient is governed by the more common use of the right hand for palpation. It needs very little practice to acquire an equal degree of skill with the left forefinger, the patient of course lying on the right side with the knees slightly drawn up. This position, combined with the use of the left forefinger for examining,

will be found in practice to have several advantages over the left lateral position, namely:—

(a) In the right lateral position the pelvic colon falls over to the right and downwards, and hence towards the examining finger. In the left lateral position the reverse is the case, and the pelvic colon falls away from the examining finger. In the right lateral position, therefore, one can palpate with equal facility all the structures which may be palpated in Sim's position, and in addition several inches of large intestine above the rectum are brought within reach of the finger. In practice, tumours of the pelvic colon have many times been felt with the patient in the right lateral position which could not be felt in the left lateral position.

(b) With the patient lying on his right side the venous return from the rectum is impeded by the downward pressure of the pelvic colon. Also, the twist of the pelvic mesocolon tends to strangle the superior haemorrhoidal vein, and internal haemorrhoids, if they exist, become congested and swollen and are easily palpated, as will be described later.

In the left position the blood tends to drain away from the rectum and pile-bearing area, and any haemorrhoids become empty and small. It is no doubt the use of the left lateral position or the inelegant knee-elbow position, with drainage of the blood away from the area of examination, that has led some clinicians to state that internal haemorrhoids cannot be felt with the finger. The question of the palpation of internal haemorrhoids will be discussed later.

Once the clinician accustoms himself to the use of the right lateral position for the routine examination of the rectum, he will find it very rarely necessary to use any other position. But mention will be made later of the occasional uses of the knee-elbow, the left lateral, and the dorsal positions.

(c) The right hand is free for manipulative and operative purposes.

(II) INSPECTION.

It is always advisable to wear a pair of rubber gloves.

The buttocks are drawn apart and one observes the appearance of the anus and surrounding skin. The presence of such conditions as redness and excoriation of the skin, skin tags, perianal haematomata (the so-called external piles), prolapsed internal piles, warts, worms, ulcers, etc., are carefully noted. The external openings of fistulae are noted, and if necessary a probe may be passed gently into the track. It is possible for the external opening of a fistula to be sealed over at the time of the examination, and to appear as a weak, red looking spot on the perianal skin. A little pressure with the end of a probe on this spot will often result in the release of a little sero-purulent material, and the probe will pass on into a fistula. This is quite important as frequently patients have been seen

complaining of recurrence of pain and discharge in the anal region, and who state they have been told by their doctor that "there was nothing wrong with them," whereas probing as described has resulted in the discovery of a small fistula and appropriate treatment has cured the condition. The patient is now asked to "strain down." One will now note the gradual relaxation of the corrugator cutis ani muscle followed by the relaxation of the external sphincter and perhaps the slightest protrusion of mucosa. Whilst the patient is straining down internal piles may prolapse, but more important, a prolapsus recti may reveal itself. Neglect of this procedure has led to missing the diagnosis of a prolapse, a patient giving an indifferent history of his complaint. In cases of anal fissure the external sphincter is held rigidly contracted in spite of straining down.

Now place the two thumbs one on either side of the anus and attempt to draw the anus gently open, stopping immediately if any pain is caused. Pain as a result of this manoeuvre almost invariably means the presence of an anal fissure, usually to be seen as a crack in the middle line posteriorly. The position is sometimes marked by a oedematous fold of mucous membrane, the so-called sentinel pile.

(III) PALPATION.

The anal and perianal regions are now palpated, particularly for induration in the ischio-rectal fossae and at the anal verge. Any obvious ulcers or warts are also palpated. One should now proceed to the insertion of the left forefinger into the anal canal and later on into the rectum. This should be a painless process, and is painless if done in the manner to be described, and provided of course there is no fissure nor inflammation of the anal verge, both of which conditions will have been noted already. In the presence of an anal fissure it is rarely possible to make a complete and painless rectal examination unless steps are taken to anaesthetize the fissure. The examining finger is well lubricated all round and throughout its extent, preferably with a water soluble lubricant. A cheap and useful lubricant is mucilage of tragacanth, with 1-1,000 oxycyanide of mercury. The examining finger is simply dipped into a small jar of this lubricant. The longer the time taken to insert the finger, the less will be the discomfort caused to the patient. The patient is again asked to strain gently down to get relaxation of the sphincter, and the pulp of the finger is placed flat on the anal aperture and steady pressure made. When the sphincter is felt to relax the finger is introduced extremely slowly with a rotatory movement. With the finger inserted between an inch and an inch and a half, i.e., about half the length of the finger, the anal canal which it occupies is palpated with a slow rotary movement of the finger. It is a matter of practical experience that more than half the diseases of the rectum occur in the anal canal, and it is remarkable how often the right diagnosis is missed as a result of the clinician passing his

finger rapidly to its extent into the rectum and paying little attention to this important area. It is during this part of the examination that any internal piles may be felt as very soft longitudinal ridges which slip past the finger as it is rotated. Without the rotary movement they cannot be felt, but by means of this manoeuvre internal piles can invariably be felt even if only to the first degree. Enlarged anal papillae or polypi may also be felt. The space intervening between the internal and external sphincters should be carefully noted. This is very variable, and is due to the over action of the levator ani muscles pulling the sphincters apart. It is felt as a distinct sulcus running round the anal canal, and is always more pronounced in the middle line posteriorly. The degree of separation is a measure of the over action of the levator ani muscle, and is found in such conditions as chronic constipation from whatever cause, hypertonicity and spasm of the sphincters, or as a result of the presence of a "pecten band," a pathological ring of fibrous tissue round the anal canal just deep to the mucosa of the pecten and first described by Miles (*Surgery Gynaecology and Obstetrics*, 1918, XXIX, p. 49). The finger is now pushed on further into the rectum, but still with a rotary movement in the long axis of the finger until it is inserted to its full extent. The distance the examining finger may be inserted into the rectum depends on the fatness of the patient's buttocks, the length of the examining finger, and the degree of flexion possible at the metacarpo-phalangeal joint of the examiner's middle finger. As the finger is advanced and rotated each part of the rectal wall is palpated in turn with the sensitive pad of the finger. Although the anal canal is from one inch to one and a half inches, the rectum about five inches, and the average forefinger only three inches in length, yet with good flexion of the metacarpo-phalangeal joint of the middle finger and with steady pressure on the perineum, it is possible quite frequently to palpate up to the polvi-rectal junction. During this examination one may note:—

(a) *Faeces*. Here the doubt may arise as to whether one is palpating faeces or a new growth. Faeces, of course, can be indented, but if there is still a doubt an examination later, after emptying the rectum, will as a rule make the diagnosis clear. Ernest Miles says: "If there are faeces in the rectum, the chances are that the patient has not got cancer of the rectum."

(b) *Ballooning of the rectum*. This is a most apparent dilatation of the ampulla of the rectum sometimes found in cases of cancer of the upper rectum, or recto-sigmoid.

(c) *Neoplasm*. Cancer of rectum is only too easily diagnosed with a finger in the rectum, but how often, unfortunately, is this disease allowed to become inoperable, not because the patient has not sought advice, but because the doctor has not examined the rectum. When a cancer is discovered in the rectum the next

question to determine is whether or not it is fixed to the deeper structures.

Cancer of the rectum is often classed as fixed when in reality it is not. The writer believes that if the examiner is in doubt about a cancer of the rectum being fixed, then in all probability it is not fixed. When a cancer of the rectum is fixed it is most obviously fixed. An attempt should be made to discover how far the growth extends round the bowel. Miles teaches that a cancer as a rule grows round about a quarter of the circumference of the bowel in six months, i.e., it takes roughly two years to encircle the bowel. In other words the age of the growth and therefore an idea of the extent of the upward spread, may be estimated roughly by the circumference of the bowel involved.

(d) *Stricture of rectum*. This also has a characteristic feel like a clean cut hole in the centre of a diaphragm.

(e) *Ano-rectal fistulae*. I shall not here consider in detail the investigation of ano-rectal fistulae, except to state that the examination of a fistulae should always be carried out with the patient lying on the side of the external openings, or, if there are external openings on both sides, on the side of the main one. This enables the examiner to look down on to the fistula, the upper buttock being held out of the way.

(IV) OTHER METHODS OF EXAMINING THE RECTUM.

Examination of the rectum by means of the proctoscope and sigmoidoscope and by X-rays hardly come within the scope of this paper, but attention should be drawn to the futility of the X-ray examination of that portion of the large bowel distal to the recto-sigmoid junction after a barium enema. The sigmoidoscope on the other hand is of the greatest use in the diagnosis of lesions of the upper portion of the rectum, the recto-sigmoid junction and pelvic colon.

It is when carrying out a sigmoidoscopic examination of the rectum that the positions other than the right lateral may be of value. With the patient in the right lateral position with the consequent falling over of the sigmoid loop towards the middle line, it is sometimes a little more difficult to get the end of the instrument around the bend in the bowel. In the left lateral position the pelvic colon tends to drop towards the left loin and to straighten itself out, making the introduction of the instrument easier. In the presence of much fluid faeces, the knee elbow position is best as the fluid is not continually running down the instrument and obstructing the view. Under these circumstances a sucker is a great help. It should not be necessary to mention that a digital examination of the rectum should always proceed the introduction of the sigmoidoscope. With the development of the modern injection treatment of haemorrhoids, the proctoscope has become a widely known and popular instrument.

(V) EXAMINATION OF STRUCTURES PER RECTUM.

Different positions of the patient may help when different organs are under examination. With the patient in the dorsal position, with the head and upper part of the trunk slightly raised and the thighs slightly fixed, many pelvic structures tend to drop directly backwards on to the examining finger. This is an excellent position in which to examine the prostate, the seminal vesicles, and the base of the bladder, although the knee-elbow position is also an excellent position in which to examine these structures. In the dorsal position and with the bladder empty, a very thorough bimanual examination of the pelvis may be made per rectum in both the male and the female. In the female the vaginal walls, the external os, the cervix, and the body of the uterus are easily felt, and the tubes and ovaries also may be palpated.

The cervix uteri is a great pitfall in examining the female per rectum, and its varying size and shape has often led to a wrong diagnosis of a pelvic mass. It is a good rule in the rectal examination of the female to start by locating the cervix. This simple rule will prevent many mistakes. Foreign bodies in the vagina, such as pessaries, may also lead to confusion if not thought of. This position also in the male gives good access to the rectovesical pouch with very little disturbance of a sick, patient, as, for example, in cases of intra abdominal catastrophe. The use of the knee elbow position in the examination of the prostate and seminal vesicles and in sigmoidoscopy has already been mentioned, but in this position many structures which may be palpated with ease with the patient in the lateral or supine position, tend to fall away out of reach of the examining finger. The right lateral position will be found, with the above exceptions, to be the best for the ordinary routine examination, of structures per rectum as well as of the rectum itself. Each region *i. e.*, anterior, lateral and posterior may be palpated in turn.

Using the left forefinger the posterior structures, *viz.*, the sacrum and coccyx, and any enlarged retrorectal glands may be felt. Laterally the ischiorectal fossae, the bony walls of the true pelvis, and the ischiorectal spines may be palpated. Still using the left forefinger and rotating the forearm, the anterior structures may be felt, but it is often easier, with the patient on the right side, to use the right forefinger to examine the anterior rectal wall and the structures which may be palpated through it.

No consideration of the clinical examination of the rectum would be complete without reference to the rectal examination of the child. It should be remembered that the forefinger may be used to examine the rectum even in the new born infant. The pelvis of the child is relatively very small, and a large part of the abdominal cavity may be palpated per rectum. An intussusception may be felt

rectally, as may also a stone in the bladder of a small boy, the prostate here being vestigial.

In conclusion it may be pointed out that no great skill is required to make a most instructive and clinically valuable examination of the rectum. Apart from many minor but distressing conditions of the anus and anal canal, which may be recognized and easily cured, it must never be lost sight of that by far the greater number of people who die of cancer of the rectum do so not from the failure of the patient to consult a doctor soon enough after the onset of symptoms, nor from the severity of the modern operation (which has a cure rate in many clinics of nearly 70 per cent.) for the condition, but because the doctor has not put his finger into the rectum of the patient who has sought his advice and given a history clearly calling for a rectal examination, and once again the chance of bringing a case of cancer to operation and probable cure has been missed. An old Scotch clinician used to say "*Rectum est rectum examinare*," bad latin it may be, but good surgery, for he translated it, "it is right to examine the rectum."

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SULFANILAMIDE: ITS USE IN OTOLARYNGOLOGY

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Sulfanilamide has been of special value to the otolaryngologist in the management of acute streptococcic infections of the sinuses, the pharynx, the larynx, the trachea, the eustachian tubes, the middle ear and the mastoid. In one case of streptococcic meningitis and in two cases of laryngotracheobronchitis the drug has been the means of saving the life of desperately ill patients.

Repeatedly we have seen the acutely inflamed throat respond quickly to adequate dosage of sulfanilamide when used in conjunction with regular methods of treatment. These cases show a scarlet edema of the pharynx, often complain of pain in the neck on turning the head due to the swelling of deep cervical glands against the vertebral fascia, sometimes a gray pseudo-membrane over the tonsils and the soft palate. The illness may be aggravated by an annoying dryness of the throat. Subjectively these patients improve several days before the objective signs begin to disappear. Perhaps that is partly due to the analgesic effect of sulfanilamide, an action of the drug that varies considerably in different individuals.

Many cases of acute sinusitis have exhibited a gratifying improvement early in the course of the disease, when sulfanilamide was added to the regimen of treatment. Again it is noteworthy that subjective improvement precedes the objective. The pain and discomfort are relieved days before the discharge diminishes. As the case proceeds we have often noticed marked diminution in the turgescence of the turbinates.

A potential source of danger in otitis media is the tendency to place too much reliance on sulfanilamide alone. Again, the analgesic effect of the drug may lead to a false conclusion that the patient is recovering when quite the opposite may be true. Early myringotomy, repeated if necessary, must remain our basic weapon against complications in otitis media. The many of our cases have recovered without untoward incident, when sulfanilamide has been used early and adequately. But it must be remembered that sulfanilamide should always be used as an adjunct to the treatment, and should not be depended on to carry the burden alone. The ear that drains a thin sero-sanguinous fluid following tympanotomy seems to be the type that clears up most readily under sulfanilamide therapy.

Sulfanilamide seems to possess the faculty of masking the symptoms of mastoiditis. Several of our cases that have finally come to surgery have shown rather remarkable remissions of symptoms early in the course of the disease. Three such cases were discharged, only to return after varying lapses of time, with the mastoid so diseased that surgery had to be done. On removing the cortex at operation these cases exhibited a short flash of pus lying rather superficially. No more purulent exudate could be demonstrated throughout the area. There appeared island of pink granulation tissue lying between partially necrosed bony spurs. Certain of the mastoid cells would show no macroscopic involvement at all. The whole process suggested a strong stand on the part of the tissue involved to resist the infection, a stand which just barely failed. Nevertheless it is noteworthy that treatment of otitis media using sulfanilamide as an adjunct has certainly reduced the number of cases of mastoiditis. Fewer cases are coming to surgery, either on our private or clinic services. When mastoiditis has become fully established as evidenced by such signs as the type of discharge, the blood count, the temperature curve, the sagging of the posterior wall of the external auditory canal and the x-ray evidence of bony changes, it should be stated that to temporize with sulfanilamide or anything else is dangerous. Thorough surgical eradication of the focus of infection must be done in such event.

Dependence on sulfanilamide alone in the case of streptococcal meningitis following mastoidectomy is apt to be a fatal mistake.

Here the focus of original infection, i.e., the mastoid, must be reexplored and carefully cleaned with the curette. This principle was vividly demonstrated to us in a case of ours which showed but indifferent response to sulfanilamide therapy by itself. On re-opening the original operative site, thorough accelerated most remarkably.

Since our adoption of sulfanilamide in the treatment of acute laryngotracheobronchitis we have felt that a strong support has been given us in managing this extremely dangerous condition. Before the drug was available our mortality experience in this disease was extremely high, in agreement with other throughout the country. Despite frequent bronchoscopic removal of the characteristic thick gummy plugs of exudate from the bronchi these patients, nearly always children under seven years of age, slowly choked to death as diminution of the breathing spaces progressed. With the use of sulfanilamide the exudate in the bronchi seems to be of liquid character, and tends to be readily expelled via the cough reflex. It is noted that the febrile reaction in these cases does not reach the alarming heights it did before the use of sulfanilamide. So that in the treatment of acute laryngotracheobronchitis we feel that sulfanilamide has been a life saver on several occasions.

Any potent drug necessarily carries an inherent warning of caution in its use. Many types of untoward reactions have followed the administration of sulfanilamide. These have been noted in the large volume of discussions now appearing in the literature. In our experience we have noted one or two cases of transient mental aberration, several cases of skin rash, numerous complaints of slight dizziness, two cases of mild cyanosis. These reactions have all disappeared promptly on cessation of the drug's administration. In no event have we had occasion for alarm over these signs of toxicity. Two cases of acute yellow atrophy of the liver have recently been reported from California. So that now the blood count, the urine, the eyegrounds, the skin, the temperature, the mental reactions, the degree of cyanosis and the appearance of jaundice must be observed and studied during the administration of the drug.

Excellent reports on the use of sulfanilamide in trachoma are now appearing in the current literature. Seemingly there are some promising investigations under way. To date our personal experience has been limited to three cases, none of which have been under scrutiny for sufficient length of time to enable us to draw conclusions therefrom.

DOSAGE

Dosage must be controlled by such factors as the type and virulence of the disease under treatment, the age, weight and physical condition of the patient, the presence or absence of various complications which might modify the indications for the use of the drug.

and the point in the clinical course of the disease at which therapy with sulfanilamide is begun. So that a rule of thumb for adequate dosage cannot be established. There is needed a sufficiently high and constant blood-stream concentration of sulfanilamide to get the patient well. To some that means so many milligrams of the drug per 100 c.c. of blood. Practically the dosage is gauged by the patient's reactions and the response of the disease clinically. We habitually follow this practice.

SUMMARY

In summary it may be stated that sulfanilamide has proven to be a valuable aid to the otolaryngologist. We stress the use of the term "aid" or adjunct, because it has been our experience that when utter reliance is blindly placed in any one therapeutic measure there is sure to be grief. Caution should be used in interpretation of the signs of clinical improvement when sulfanilamide is being administered because, through its analgesic action, often of marked degree, valuable signs may be masked and a sense of false security may dull the otherwise keen observation of the clinician. In certain diseases sulfanilamide has shown itself to be the most potent weapon at our command. The necessity for combatting disease with a multitude of methods has not been lessened by the advent of sulfanilamide but in our work we have felt definitely by the gift of this new weapon.

(Southwestern Medicine, June, 1939).

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Extracts.

GENITO-URINARY INFECTION IN CHILDHOOD.

SHELDON, W. *Brit. Med. Journal*, 4105: 551, 1939.

The treatment of pyelonephritis may be divided into the management of acute, and chronic or recurrent cases. For many years the treatment of choice for acute pyelonephritis has been to give alkalis in doses sufficient to render the urine alkaline and the question that now arises is whether this treatment should give place to mandelic acid or sulphanilamide therapy. The first point is whether alkalis alone can bring about a cure; I submit that the long experience with alkaline treatment leaves little doubt that complete cure is usually obtained. This aspect was particularly investigated by NEALE (1931), who analysed 130 cases, and found that when cure came about it was complete, and that in later years there was no evidence of permanent or progressive damage to the kidneys. The second point is whether the alkaline treatment is of itself at all harmful to the patient, and here again alkalis show up well. They can be given in large doses to children of any age, and their only limitation is that in infancy they may sometimes cause a slight diarrhoea. Even this is lessened if bicarbonates and citrates are used in a mixture instead of relying on citrates alone. We have, then, in alkalis a harmless efficient remedy for the majority of children with acute pyelonephritis. Mandelic acid has the disadvantage that it is an acid preparation, which often has to be combined with extra acidifying agents, and for a child who is acutely ill with a high temperature treatment by alkalis is, on general principles, to be preferred to treatment with acids. Sulphanilamide overcomes this difficulty in that it may be combined advantageously with alkalis: but its toxic symptoms, although admittedly uncommon, are greater than those of alkalis alone. Perhaps the most important point of all is to know whether there is in the background some congenital abnormality of the urinary tract. Now, although treatment with alkalis alone will clear up the majority of cases of acute pyelonephritis, it may relieve, but certainly will not cure, a case with urinary tract deformity. If it is found that a thorough trial of alkaline treatment over a period of three weeks or so is not leading to a cure, special urological investigations, mentioned later, should be undertaken to determine the presence and nature of any congenital deformity. On the other hand treatment of acute cases with mandelic acid or sulphanilamide is likely to sterilize the urine even in the presence of a congenital deformity, and this may lull the physician into a false sense of security by masking the essentially chronic nature of the condition, and so deterring him from instituting a full urological investigation. The position may be summed

up by saying that if acute cases are to be treated with mandelic acid or sulphanilamide then after the urine has been sterilized the patient should be submitted to a full urological investigation in case some congenital deformity is being overlooked; but, by treating these cases in the first place with alkalis special investigation need only be carried out in the small group that proves resistant to treatment. These may then be treated with either mandelic acid or sulphanilamide, then after the urine has been sterilized the patient should submit to a full urological investigation in case some congenital deformity is being overlooked; but, by treating these cases in the first place with alkalis, special investigations need only be carried out in the small group that proves resistant to treatment. These may then be treated with either mandelic acid or sulphanilamide. The relative merits of these two preparations are considered later.

The most useful alkalinefying agent is potassium citrate, which must be given in an amount sufficient to render the urine strongly alkaline. In practice it is easy enough to bring the urine down to neutral, but it is often difficult to get it beyond this point. Another practical point is that it is useless to give alkalis by day and allow the urine to revert to acid during the night, and therefore treatment must go on through the twenty-four hours. No exact directions for dosage can be given, because this must be determined by testing each specimen of urine with litmus as soon as it is passed; such doses as 10 grains every three hours, day and night for an infant, and four times this dose for a child of 6 or 7 are often required. The alkaline reaction of the urine should be maintained for at least ten days after the symptoms have subsided and the urine has become free of pus. It sometimes happens that although the temperature falls, the urine becomes more and more offensive, and it is then useless to continue with alkalis; a change to mandelic acid or sulphanilamide would be indicated.

The development of urological technique suitable to young children has demonstrated the fact that when an acute infection in spite of treatment, becomes either chronic or recurrent, this is generally associated with some stasis of urine: occasionally this may be caused by a stone, but is much more likely to be due to some congenital abnormality in the architecture of the urinary tract.

Treatment by alkalis is generally quite useless, and although extensive trials have been made of such treatments as hexamine and similar urinary antiseptics, vaccines, and sera, these methods are mostly without effect. Recently, however, there have been two important advances in treatment. In the first place we have the salts of mandelic acid; and, secondly, the sulphanilamide group of drugs. Both have the great advantage for children that they are effective when given orally.

The two preparations now generally used are ammonium mandelate and calcium mandelate. Both salts have the advantage of making the urine strongly acid, although even so it is generally necessary, in my experience, to give some additional acidifying agent. Calcium mandelate is insoluble in water, but has the advantage of being tasteless. Ammonium mandelate in the form of the elixir is not unpalatable and a mixture similar to the elixir in use at Great Ormond Street is as follows:

Ammonium mandelate, 26 grains.*

Liquid extract of liquorice, 5 minims.

Elixir of gluside, 15 minims.

Water to 1 drachm.

The dose required varies according to the age: at 1 year at least 3 grammes of mandelic acid should be given in twenty-four hours, equivalent to two tea-spoonfuls of the above mixture, while double this amount will be needed for a child of 10 years.

It is essential to keep the urine sufficiently acid, and it is necessary to test a specimen each day. For this purpose a few drops of methylred should be added to a third of a test tube of urine; if the urine is acid enough it develops a pink colour, otherwise it becomes orange-coloured. Should the mandelate by itself not produce the necessary acidity, an agent such as ammonium phosphate must be given. A suitable mixture is:

Ammonium phosphate, 7½ grains.

Liquid extract of liquorice, 5 minims.

Syrup of lemon, 15 minims.

Water to 1 drachm.

The amount required will be indicated by the methyl-red reaction; from two to six tea-spoonfuls a day may be necessary. The administration of mandelic acid should be maintained for a week after the urine has become sterile, otherwise a relapse may easily occur.

The sulphanilamide group of drugs—prontosil, proseptasine, uleron, sulphapyridine—since their first introduction to clinical medicine a little more than two years ago, have already established a world-wide reputation, and have been shown to possess such a wide sphere of usefulness that it is not surprising to record their definite value in urinary infections. One effect of this has been to limit quite sharply the use of mandelic acid.

Sulphanilamide is most effective in a slightly alkaline urine, and it is advantageous to prescribe twenty or thirty grains of alkali a day. This dose is of course not comparable to the larger doses given in the alkaline treatment of acute urinary infections. The concentration of sulphanilamide required for sterilization of the urine—50 mg. per 100 c. cm. of urine—can usually be obtained without difficulty even in the face of impaired renal function, which

* Equivalent to 1½ grammes of mandelic acid.

gives the drug a definite advantage over mandelic acid. Once again the bacteriology of the urine is important, for the sulphanilamides usually give a prompt success in *B. coli* infections, and will often clear up that most resistant organism *B. proteus*, but their action against the *Streptococcus faecalis* is disappointing: mandelic acid is here the weapon of choice.

The dose of sulphanilamide varies with the age, but it is more effective to give a relatively big dose over a short period than prolonged administration of a small dose. To an infant of 6 months 0.25 gramme (half a tablet) six hourly, and four-hourly at 1 year, is generally tolerated without difficulty, while in the second half of childhood 0.5 gramme may be given every four hours. The usual precautions against giving sulphur-containing drugs or foods such as aperient salts eggs must be observed in order to lessen the chance of cyanosis. Toxic effects from these drugs are, however, uncommon; the one that in my experience has caused most difficulty has been vomiting, although that has not been at all common; should it occur, it will continue until the drug has been completely withheld. A morbilliform type of eruption occasionally arises, and I have seen it in one case. The rash disappears when the drug is withdrawn. The most serious complication is agranulocytosis; but fortunately it is rare.

MANAGEMENT AND TREATMENT OF EMPYEMA IN CHILDREN.

The treatment of empyema in children requires the careful attention of both the pediatrician and the surgeon, writes Grover C. Penberthy and Clifford D. Benson in *The American Journal of Surgery*, No. 39. The one principle which is fundamental and has caused a tremendous lowering of mortality rate is the avoidance of the creation of an open pneumothorax in the formative stage of an empyema. When the empyema is a true abscess, either closed or open methods of drainage may be advocated.

Mortality.—From 1926 to 1936 we have treated 407 cases with a mortality of 10.3 per cent. In addition, we found the age of the patient an important factor. Infants under 2 years of age show a high mortality rate but after the age of 2 each year decreases the mortality. During the past 2 years, we have instituted drainage as soon as pus has been obtained on aspiration in children under 2 years of age, which has resulted in a decreased mortality rate in this age group.

Our routine is aspiration until frank pus is obtained. At this time, the trocar-cannula-catheter method of closed drainage is instituted under local anaesthesia. Closed drainage is maintained either by clamping the catheter and aspirating every 4 hours with a syringe, or by connecting the catheter to tube under water for continuous drainage. Tidal irrigation is practiced when feasible. The original catheter is usually left in place 12 to 18 days, at which time it is cut and allowed to remain as an open drain. In the event that there is clinical evidence of retention, manifested by a rise in temperature or roentgenologic evidence of fluid, the catheter is replaced by a larger open tube. Local or nitrous oxide-oxygen anaesthesia is used in order to lessen the mental trauma. The empyema cavity is daily irrigated with boric acid or Dakin's solution. Every other day the cavity is measured, and when it only contains 10 c. c. the tube is removed. With this technic rib resection was required in only 15 of the 407 cases. The average hospital stay was approximately 6 weeks.

Lowered incidence of Chronic Empyema.—As a result of improved treatment chronic empyema is seen much less frequently.

Patients presenting themselves with a large empyema cavity and bronchial fistula are treated by packing the cavity. This decreases the cavity in 2 or 3 weeks by stimulating the production of granulation tissue, which gradually pulls the lung out toward the chest wall. Simultaneously, the fistula closes. In the event there is still a residual empyema cavity, it can then be unroofed or a graded regional thoracoplasty performed. In those patients with a large pneumothorax persisting after removal of the pus and in whom re-expansion of the lung has been slow, we have materially shortened the period of morbidity in the past 2 years by applying the Wangenstein method of suction.

Tuberculous empyema with mixed infection is rarely seen in children, but when it does occur, closed catheter drainage with subsequent irrigation of the cavity with 1 per cent aqueous solution of gentian violet is quite satisfactory in clearing up the infection. If there is a parenchymal lesion and the empyema cavity fails to obliterate, a thoracoplasty in stages is performed.

Repeated small blood transfusions during the recovery stage of empyema are highly successful in alleviating the secondary anaemia so often seen in conjunction with this disease and materially shorten the period of morbidity. A high-caloric, high-vitamin diet is essential to restore these patients to their normal nutritional status.

TREATMENT OF BRONCHIAL ASTHMA WITH INSULIN SHOCK.

Dr. Z. Askanas, of Warsaw, recently reported on the treatment of bronchial asthma by the method of Dr. Wegierko, of Warsaw University, a method based on the observation that hypoglycæmic shocks provoked by insulin control attacks of dyspnoea in cases of bronchial asthma and diminish the disposition to recurrence. The effectiveness of the treatment is attributed not to the action of insulin itself, but to the desensitizing effect of the hypoglycæmic shocks. The author administered subcutaneously 40 units of insulin with the patient's stomach empty. The first manifestation of shock appeared in about forty-five minutes as a sensation of heat and a slight tremor of the hands. In from seventy to ninety minutes other features of shock appeared: tremor of the limbs, great hunger, profuse perspiration, a decrease in the pulse rate, a slight decrease in the arterial pressure, and in the temperature and hyperreflexia. Sometimes the patient complained of palpitation of the heart or uneasiness. Great relief from the dyspnoea was obtained soon after the early manifestations of shock had appeared. Some minutes later the dyspnoea stopped entirely. The shock was stopped in from thirty to sixty minutes by the oral administration of large doses of sucrose solution, bread, honey, cakes, and fruits. An immediate stopping of the shock can be obtained by intravenous injection of 20 to 40 per cent dextrose solution. To obtain improvement for a longer time, the author repeated the shocks every one to three days. The whole treatment consisted of from five to seventeen shocks.

In fifty-eight of sixty-five cases, great improvement was obtained. The attacks of dyspnoea have not reappeared in from ten months to three years after treatment. Shock therapy failed to achieve permanent results when the bronchial asthma was associated with extensive pulmonary emphysema or serious endocrine disorders or was related to focal infection. There were seven cases of such asthma in the series. Shock therapy is the method of choice for asthma related to emotional disturbances, allergy, functional endocrine disorders, and, especially, asthma in children. Even when permanent relief was not obtainable, there was prompt control of the dyspnoeic attack in all cases.—*Journal A. M. A.*

Medical News and Notes.

THE KRISHNA DISTRICT MEDICAL ASSOCIATION, MASULIPATAM.

(The Krishna District Branch of the Indian Medical Association).

Dr. K. CHELAPATIRAO NAYUDU, L.M.P., of Bezwada was voted to the chair to preside over the meeting of the Joint Session of the Krishna District Branch and the Bezwada Branch of the I.M.A. held on 17-2-40.

Resolutions on the formation of the Andhra Provincial Branch of the I.M.A. were moved by Lt.-Col. T. S. SHASTRY, the President of the Krishna District Branch of the I.M.A. and were unanimously passed.

Then the Anniversary Function of the Bezwada Medical Association began. This was presided over by Dr. E. SOMASEKHAR, F.R.C.S. (Eng.), District Medical Officer, M. & S. M. Ry. Hospital, Bezwada.

The following programme was gone through.

1. Presidential address which included a discussion on Enteric by the President.
2. The Annual Report was read by Dr. B. SAMBAMURTI, the Secretary of the Bezwada Medical Association.
3. A case of Myelocoele, a case of Hermaphrodite, and congenital Syphilis were exhibited by Dr. H. C. HALGE, I.M.D., of the Bezwada Government Hospital.
4. Case notes on Tetanus and Pyloric Obstruction were read by Dr. M. V. SUBBARAO, L.M.P., Resident Medical Officer, Government Headquarter Hospital, Masulipatam.

There was much discussion on the above cases; and the meeting concluded with the remarks of the President.

THE TINNEVELLY DISTRICT MEDICAL ASSOCIATION, PALAMCOTTAH.

(Tinnevelly Branch of the Indian Medical Association).

The monthly meeting of the Tinnevelly District Medical Association was held at Palamcottah, on Sunday the 18th of February 1940, under the Presidentship of Lieut. Col. K. V. RAMANA RAO, I.M.S.

Dr. T. S. VAIKUNTARAMAN, Tinnevelly, read an interesting paper on the Treatment of Diabetes.

Dr. K. RAMA AYYAR, M.B.B.S., Hony. Asst. Medical Officer, Government Head-quarters Hospital, Palamcottah, read an interesting paper on the Treatment of Enteric Fever.

After discussion by the members present, Lieut. Col. K. V. RAMANA RAO, I.M.S., summed up the salient and important features of the papers and their treatment in detail and offered his thanks to the lecturers.

THE MEDICAL PRACTITIONERS' ASSOCIATION, NUZVID.

The sixth Annual Meeting of the above Association was held on Sunday, the 28th January 1940 at Nuzvid, Lt.-Col. T. S. SHASTRI, I.M.S., District Medical Officer, Kistna, presided.

The following papers were read :—

- (1) The Treatment of Sprains by Lœriche's Method, by Dr. Y. S. CHOUDHARI of Madanapalli.
- (2) Dr. D. W. SEMMENS, M.D., of the local Giffard Mission Hospital, read his case notes on 4 interesting cases, viz., (1) A case of Retroperitoneal Cancer, (2) Renal Calculi for which a nephrectomy was done, (3) Infective Granuloma Inguinale and (4) Cancer of body of Stomach.
- (3) An exhaustive paper on "The Role Minerals in Health, Disease and Nutrition" by Dr. V. ANANTHACHARI, L.I.M.
- (4) Case notes upon a case of 'Preputial Calculi' by Dr. S. S. RAMA RAO of Khanumole.
- (5) A paper on "The Toxic Manifestations of Menstruation" by Dr. N. RAMA RAO, L.M.P.
- (6) A case report of 'Hydrocephalus' by Dr. P. ANGAI AH.

The President and members held a long discussion over the above topics and the meeting closed by 9 p.m.

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