THE TREATMENT OF TUBERCULOSIS OF THE
UPPER AIR PASSAGES.

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In my paper I will omit reference to tuberculosis of the mouth, pharynx, nose and nasopharynx, and will discuss only the treatment of tuberculosis of the larynx.

The following prefatory remarks will make the matter clearer:

Larynx tuberculosis, or the phthisis of the larynx caused thereby, can heal spontaneously, without special, local or general treatment.

Most frequently, superficial ulcers of the vocal cords and milder cases of affection of the posterior wall of the larynx and processus vocales heal by cicatrization. Severe, destructive processes, which are accompanied by granulation formation and lesion of the cartilage, followed by dysphagia and consequently rapidly leading to malnutrition and cachexia, very rarely heal, especially in young patients and those affected with diffuse pulmonary affections, accompanied by fever and lowered body resistance.

The best chances for healing is found in those cases where the disease appears as a localized infiltration or tumor-like prominence on the posterior laryngeal wall, which has little or no tendency towards degeneration, causes slight symptoms and is accompanied by no apparent loss of bodily vigor. Here belong, also, the so-called tubercular tumors of the larynx, especially of the **false cords**.

The worst prognosis is to be given in the diffuse infiltrations of the outer laryngeal borders, viz., the epiglottis, when they extend over onto the false cords and attack the ventricle; furthermore, infiltration of the arytenoid cartilages, which leads to rapid destruction and necrosis, or when accompanied by granulation formation cause stenosis; also, the diffuse, degenerative infiltrations, involving the larynx in toto; finally, miliary tuberculosis.

The possibility of a cure is, in the first place, dependent on the constitution and resistance of the patient, the anatomic character of the pulmonary affection and its extent, the age of the patient, his occupation, his financial status, and the period at which the proper treatment is begun.

Although the tubercular process may heal, or cicatrize, tubercular deposits may remain in the depths of the tissue, which, although subject to fibrous degeneration, possess quiescent germs, which can cause recurrences. This occurs so much more easily if renewed unfavorable conditions, such as straining, cause inflammations, which lead to dysphagia and malnutrition. They almost always lead to exacerbation of the pulmonary lesion. Secondary infections play in laryngeal phthisis the same weighty role that they do in pulmonary tuberculosis.

Of all the various drugs used in laryngeal phthisis, such as creosote-glycerin, phenol, balsam of Peru, sublimate, iodoform, iodol, menthol, etc., the only one that has gained a distinct position in the therapy is lactic acid, introduced by Krause.

This remedy cannot, however, be used in all cases, as it often causes severe inflammatory symptoms. It is indicated in hypertrophic ulcers, in soft granulations, and for the purpose of cleansing the floor of ulcers. It has very little effect on hard infiltrations.

Menthol and iodol are far behind lactic acid. Iodoform is indicated in certain forms of ulcers for cleansing and for excitation of granulation formation.

Phenolum sulfuricinicum frequently exercises a favorable influence on tubercular infiltrations, but requires certain precautions in its use.

Cocain and eucain may be used as sprays in 5 to 10 per cent solutions by means of a curved tube, but only during phonation, in order to prevent poisoning.

Antipyrin lengthens the anesthetic action of cocain and eucain (Weil). Orthoform, advocated by Einhorn and Heinz, act well in the dysphagia of larynx phthisis. It acts, however, only on ulcerated surfaces denuded of epithelium, and is absolutely contraindicated in infiltrations. Its action in ulcers lasts from 6 to 10 hours. It is advantageous to prescribe it with an equal amount of talc and an addition of one per cent cocain (or eucain) to 4.0 of orthoform. The insufflations should be repeated twice daily. The patient must be forbidden to gargle or drink afterwards.

For about six years I have been induced by the powerful, deep action of concentrated potassium permanganate solutions in lupus to use it for the destruction of unclean tubercular ulcers, which constantly renew their dirty gray exudate, and the results have been excellent. Such conditions were most frequently found on the infiltrated and ulcerated false cords, never on the true cords or posterior laryngeal wall or epiglottis. This exudate consisted of necrotic tissue filled with innumerable pus cocci, epithelium and detritus. Tubercle bacilli were never found. None of the drugs in use could destroy this exudate. Even after the use of the galvano-caustic and the formation of a scab, the exudate reappeared on the granulating wound. Only after repeated painting with a lukewarm, saturated solution of potassium permanganate did I obtain healthy granulation formation and a slow cicatrization. I judged that the process affected the mucous membrane of the ventricle also, and from there passed over to the false cords. Further observations showed the favorable influence of this remedy on chronic ulcerations and even superficial infiltrations, for which it can be most heartily recommended. Its use is painless, the reaction is nil. The black scab is cast off in two to three days, according to the intensity of the cauterization. Never allow crystals to remain on the swab. The action is very deep, the tissue melts away by a quick necrosis and a deep defect remains. I have observed this deep action in pharyngeal tuberculosis and warn against the use of crystals, on account of the severe pain which they cause.

The solution is made best in a reagent glass, heated to boiling, the crystals pulverized by a glass rod, and the fluid carefully decanted from the precipitate and cooled. The swab must have no excess of the solution. Paint it until the ulcer

has a very dark color. The dysphagia frequently becomes less after the cauterization. The infiltration shrinks and becomes covered with new granulations after the scab is cast off.

I have used the same drug in nasal tuberculosis, lupus and syphilitic nasal ulcers, frequently with quick result. It is, however, no panacea, for I had, also, cases without results and had to use surgical treatment.

The treatment of laryngeal phthisis is divisible into two groups, according to the nature of the disease, i. e., the treatment of the laryngeal lesions, and that of the pulmonary, which almost always complicates it.

In a disease which has lasted many years, it is necessary for the patient to learn that improvement and eventual cure is obtained by prevention of the unfavorable conditions which have caused it.

The localities along the Mediterranean, of the Riviera or Levant, although they have a lime subsoil, have in many cases been found to be satisfactory (Mentone, San-Remo, Cannes, Nervi). Favorable results have also followed residence in Meran, Arco, Palanza, and, in summer, Gleichenberg. According to my mind, the choice of the place is far less important than the choice of the physician. Weak patients with high fever, severe dysphagia and extensive pulmonary involvement, and who are poor, should not be sent to these far away places.

The first condition for the improvement of these patients consists in access to an abundance of pure, fresh air.

Feverish patients, so long as their strength allows, are kept in bed, in order to conserve their strength and prevent discomfort and weakness.

The partial, temporary and frequently insufficient results of the treatment with lactic acid, as well as those of the incision in the infiltrated epiglottis or posterior laryngeal wall, as recommended by Moritz Schmidt, and which in some cases causes a diminution of the dysphagia by means of a stretching of the tissues, compelled us to seek other remedies and methods which could produce positive and lasting cures. For this reason I proposed, in 1888, a surgical treatment of larynx phthisis, and published its basis in my book "*Die Heilbarkeit der Larynxphthise und ihre Chirurgische Behandlung*."*

*The Curability of Phthisis Laryngis and Its Surgical Treatment.

Under the surgical treatment I had the following to say: "Above all, the attempt must be made by means of the most energetic destruction or removal of the tubercular infiltrate and its products, to get rid of everything that is diseased or degenerated, and to change the ulcers into benign ones and aid their healing; furthermore, by causing the cicatrization of these ulcers and the cure of the accompanying inflammation, to successfully combat the dysphagia and to limit the imminent dangers. A therapeutic factor of no less importance consists in the building up of the body, in the prevention of all untoward conditions, and in the securing of good climatic and hygienic conditions."

It is, of course, self-evident that no method and no remedy can be considered as a panacea for any disease, especially such an unreliable condition as larynx tuberculosis. The cicatrix obtained and the lasting cure must be regarded not so much as the result of one certain treatment, but as the result of relatively complicated methods composed of the most varied therapeutic and hygienic rules.

Their result is no stable one, but is dependent on their energetic employment, and is obtained only in certain forms and stages of the disease, under especially favorable circumstances. Although I lay a great stress on the technic of the surgical treatment of phthisis laryngis and insist upon this always, I am far from believing that a perfect technic is all that is necessary to treat the patient successfully.

The physician must be therapist and surgeon in so far as the local treatment has a good prognosis only when accompanied by care of the general condition, the nutrition, and the pulmonary affection.

The statements mentioned here were made by me twenty years ago. I have been true to them in deed and word. They seem unknown to many of my colleagues, and therefore I repeat them here to prevent ungrounded attacks on the person and the method.

I have been accused of a too great optimism in regard to the results of surgical treatment and a too great enthusiasm in carrying out this method.

I should like to quote a sentence from Kant: "Enthusiasm

is that property of the human mind without which no good is ever accomplished."

It is a peculiar fact that this accusation has come chiefly from those of my colleagues who have had either little or no experience in this direction, and who, after a few usually unsuccessful experiences, have abandoned it. Some of them probably used the method in unsuitable cases. Others were discouraged on account of the difficulty of the technic, a somewhat severe hemorrhage or the use of badly chosen instruments.

In a disease considered twenty years ago as incurable, whose energetic treatment was regarded as a medical mistake (Stoerk), an unnecessary handling of infiltrations (Schroetter), or as a torment to the patient, it was a bold proposition to suggest a surgical treatment. The first cases published by Krause and myself were characterized as diagnostically uncertain. We were asked for cures of the gravest cases, patients with cachexia and diffuse infiltrations and ulcers. Every lack of result, every relapse, every passing exacerbation of these unreliable cases was used as a weapon against the method and its discover, and in certain clinics and hospitals were demonstrated to students and physicians as warning examples of the perniciousness of this method, which was condemned.

Gradually, through the aid of many trustworthy colleagues, this judgment was destroyed and the observation of more lasting cicatrization and cure of even severe cases gave an impetus to the energetic treatment (Schech, Keimer, Gleitsman, Gougenheim, Balzer, Massei, E. Fraenkel, Tessier). S. Srebrny in 1897 published a careful collection of all cases published between 1887 and 1897. Only eight authors had opposed this method, some of whom did so without personal experience and on purely theoretic grounds.

At the meeting of the Tenth International Congress in Berlin, 1880, I demonstrated a patient who had been cured for two years of a severe laryngeal phthisis. Furthermore, I showed the larynx of a patient who had been cured for three years, but who had subsequently died of intestinal tuberculosis; also, a number of cases where through surgical intervention, i. e., curetting the ulcers, or removal of the tubercular infiltration with sharp forceps, permanent cicatrization or im-

provement took place in the larynx. Most of the members were convinced of the correctness of my deductions. These were very forcibly supported by Moritz Schmidt and Hermann Krause. However, we were unable to overcome the opposition despite the fact that the specimens were recognized by Prof. Virchow as completely healed. Since certain members demanded a microscopical examination for the purpose of determining whether tubercular foci were present in the deeper tissue, under the scar, the specimen was sent to prosector Eugen Fraenckel at Hamburg. The result of his examination ran: "There was not even a trace of anything that could have been called a tubercle or like one."

Four years later the question of surgical treatment of larynx phthisis was again discussed at the Eleventh International Medical Congress at Rome. Gougenheim (Paris), Lennox-Browne (London) and the author were chosen as essayists. Eighteen members of the laryngologic section took part in the discussion. The result of the very earnest debate, which took place under the presidency of Dr. F. Semon, was a very favorable one for the value of the surgical treatment. Fifteen members argued for it on the grounds of personal experiences.

Just as favorable were the reports of Lennox-Browne and Gougenheim, who had used the method in fifty-eight cases and had obtained a cure in twenty-five cases and a distinct improvement in thirty. I discussed then the subsequent course of the cases cured since 1887, and presented to the section a colleague from Dynaburg, Dr. Sczastny, who for four years had been cured of a severe diffuse laryngeal phthisis, had recovered voice and deglutition, and showed such an improvement in his general condition and the pulmonary process that he could readily fulfill his office as chief physician of a large military hospital.

A distinct change has in a few years come over the position as to the surgical treatment of phthisis laryngis. Burger says that "after the original recommendations of Moritz Schmidt and Heryng had met and withstood a violent opposition, there appeared a stage of recognition, whose celebration at the Eleventh International Congress at Rome in 1894 will always be a source of pleasant recollection. At that very time, as Krieg correctly observes, the advocacy of energetic method was at its zenith. Since then it has declined, and I was afraid

that Kronenberg was too optimistic when he thought that now since the enthusiasm had passed away, a sober judgment would rule, which would be as far removed from doubting despondency as from thoughtless overvaluation of our ability and knowledge."

"Like Krieg," continues Burger, "I have gained from the literature of the last few years the impression that a large number of laryngologists have confined themselves to the use of antibacterial and disinfecting remedies, that most of them use lactic acid, and that relatively few treat suitable cases perseveringly and intelligently according to the principles of surgical therapy."

"With such facts in mind, one asks in astonishment whether the earlier enthusiasm was founded only on idle dreams and whether the well-known cures were only the result of an uncriticizing enthusiasm." Burger then addressed himself to those colleagues who, in his own words, broke ground in this field, and who had for the longest time carried out the treatment, viz., Moritz Schmidt, Krause and myself.

He received from M. Schmidt the following statement: "Almost one-fifth of the cases were cured. Part of them suffered from relapses, especially when the lungs were not cured." Schmidt, however, has observed for years patients whose larynx and lung affections have been cured, and who were not reinfected.

Five months ago I inquired from Prof. Spiess, of Frankfurt, the worthy co-worker of Moritz Schmidt, as to the number of curettements made by them and the details of the results of their treatment.

Prof. Spiess estimated the yearly number of curettements at about 400, i. e., at about 6000 for the last fifteen years. He authorizes me to state here that he curettes energetically, excises and works with cutting instruments without having observed that new infections were caused thereby. On the contrary, he ascribes to this therapy a large number of cures.

Krause also, says Burger, still sticks to his earlier optimistic standpoint. He is convinced (*Monatsch. f. Ohrenheilkunde*, 1904, p. 381) that this method "would be as successful to anyone, who used it intelligently and with a proper technic," as to him.

When I learned that Krause could not take part in this

congress, I went to him at San Remo, and am authorized to communicate his views.

He estimates the number of curettements performed in his policlinic and private practice at about 4000. He had never observed a secondary infection. Even in the worst cases he saw an astonishingly rapid closure of the wound.

Krause has not discarded the galvanocaustic treatment, as it is very convenient in many cases which are inaccessible except with difficulty with the surgical instruments. Furthermore, he does not doubt, though personal experience is lacking, the good results of Krieg, Mermod, etc. He cannot, however, regard this method as a panacea, which could only be claimed by one who is autocratic enough to be impatient with any method save his own. According to Krause, the galvanocaustic is only an aid to the radical surgical treatment.

In his second article, published in 1904, in the *Arch. f. Laryngologie*, Krieg says that lately he had successfully replaced the purely surgical treatment by the galvanocaustic, or had used them combined. Out of over 200 cases Krieg had obtained a permanent cure, i. e., cicatrization, in 60 poor patients, without any cauterizing agent or lactic acid. Occasionally he saw granulation formation in the vicinity of the cicatrized wound, which he regarded as an expression of the vulnerability of the tissues over the deeper, infiltrated areas.

That these results were not temporary is shown by the following letter sent to me by Krieg in May, 1908:

Dear Doctor:—

To your questions I can reply as follows:

1. I have curetted 73 times.
2. I have never had a dangerous hemorrhage.
3. I have never seen a succeeding miliary tuberculosis, nor have I observed a dangerous reaction follow the galvanocaustic.
4. I have seen 48 cases where the cure of the laryngeal tuberculosis lasted for three years. It must be stated, moreover, that an inquiry, which I have not conducted since 1904, would doubtless reveal other cases as cured.
5. An indication for total extirpation of the larynx never was seen by me.

Very sincerely,

KRIEG.

The same year there appeared the great work of Mermod

(Lausanne). By the use of sharp forceps or the galvanocautistic, he obtained lasting cures in 60 cases of diffuse phthisis of the lung and larynx of the severest type. He was able in 1903 to present 18 cured patients before the annual meeting of Swiss physicians. Of 240 cases of larynx phthisis, the cure lasted

in 60 over 1 year,
in 40 over 2 years,
in 17 over 3 years.

Even in the most severe cases, which died later on from their lung affection, Mermod obtained distinct improvement of the voice and deglutition.

That Sir Felix Semon, whom Grünwald designated as one of the opponents of surgical treatment, must be removed from their ranks is shown by the following extract from his letter of May 28, 1908:

"I think that I have clearly enough stated that we should be thankful to you for your untiring advocacy of surgical intervention in appropriate cases. I, myself, always operate in such cases, only I cannot go so far as Prof. Mermod, according to whose own words, there is no contraindication for the use of the galvanocautery in laryngeal tuberculosis. I have expressed myself in the same way in all of my writings."

We will now let the opponents of the purely surgical treatment (sharp instruments) speak, and will now commence with Grünwald. His successful results from the use of deep galvanocauterization have led him to call this method the sovereign one, and to discard the purely surgical method for fear of tubercular and purulent infection.*

Grünwald designates most of the remedies hitherto employed against laryngeal tuberculosis as unsuitable, especially the chemical cauterants, the cutting laryngeal instruments, but more especially the tearing and crushing ones, on account of injury through unnecessary and dangerous superficial traumatism and insufficient deep action. He fears to lay bare simultaneously tubercular and normal tissues—whether it be the blood or lymph system—by which a local or even a general dissemination of the infection might be caused (p. 37).

"This danger can be prevented only when this excision takes

*Die Therapie der Kehlkopftuberkulose mit besonderer Berücksichtigung auf den galvanokaustischen Tiefenstich.

place in the healthy tissue outside of the diseased area, or when the treatment leads to occlusion of the paths of infection or to the death of the germs. For this reason alone should protection of the surface be our motto. Only the smooth excision of more or less pedunculated parts would cause no damage. Here the loop comes into consideration."

According to Grünwald, the galvanocautery—the deep incision—must be considered as a panacea, on account of its slight reaction, since it gets rid of the diseased tissue and the bacteria quickly and completely, and makes possible desired result, since the infiltrate extends beyond the recognizable borders of the focus.

As to the method, Grünwald uses about a dozen lines in its explanation:

"The burning point is placed on the selected spot, and after it has been heated, is slowly pressed into the tissues, until either the distinct resistance of the normal tissues or the reddish gleam in the subglottic space calls a halt. The point should act until it is movable in the puncture-canal, about 5 to 10 seconds. Not more than two punctures should be made on account of reaction which will follow. In general, all symptoms disappear in 8 to 14 days; the scab disappears unobserved. When the burn is severe, there is a large sloughing of necrotic masses, followed by a negligible swelling."

A complete discussion of Grünwald's interesting article would transgress the limits of this paper, and will be done elsewhere. The chief point of his theory, the necessity of preserving the epithelium of the tubercular infiltration and the warning against the purely surgical method on account of infection, these have been shown by Schmidt, Spiess, Krause, Gleitsmann, Besold, Gidionsen, and by my observations of 20 years as not substantiated by clinical findings. He is right, however, when he says that infiltrations which for a long time resist degeneration, are circumscribed and exist in relatively well nourished individuals, free from fever and without dysphagia, may be treated conservatively, especially in patients who are living in sanatoria or health resort clinics. The number of curettements performed by the above named colleagues is over 12,000. According to oral and written testimony, not one of them has frequently had a severe hemorrhage or tubercular infection following a surgical intervention.

I will now take up the views expressed in a very interesting article, published this year by Besold and Gidionsen, entitled, "Pathologie und Therapie der Kehlkopftuberkulose." I can review here only the treatment, and that briefly. The interesting microscopical findings deserve great consideration, especially the photographic reproductions of microscopic specimens.

Their material consisted of 500 cases of larynx tuberculosis treated during the last 10 years at Falkenstein a. Taunus.

Of all the different methods of treatment, the surgical was found to be the best in the severer cases of larynx phthisis.

"We must characterize the instrumental treatment of laryngeal tuberculosis as very beneficial," say the authors, "and would not approach this disease without the double curette, until some better method is discovered (p. 87). Also, the extirpation of very swollen and infiltrated areas, although no more forcible method seemed to be indicated, not only caused an amelioration of existing symptoms and functional disturbances, but seemed directly commanded for humanity's sake.

"The double curette is better than the simple. The surface of the wound is covered with a scab either by the 75% lactic acid or the cautery, especially when it is not very large.

"The electrocautery—as it should be called instead of galvanocautery—deserved to be widely employed. That a reaction follows its use is conceded. To lessen it, the cautery should be used almost *white-hot* in order to attain the carbonizing of the tissue with the formation of a black or yellow scab. If it is insufficiently heated (*red-hot*) a white scab is formed, a necrosis, causing pain and dysphagia.

"Such scabs often require two to three days for sloughing, and are to be regarded as the result of insufficient incandescence. Care must be taken, therefore, to use the most intense heat, but to leave in contact the shortest possible time, repeating if necessary. If this is done, the reaction is minimal. It is over in a couple of days.

"Porcelain points are used for large surfaces and platinum for smaller. Grünwald's deep galvanocaustic puncture they consider an electrical overheating with metallic electrodes, since the point in its canal, even when the current is very strong, has a very faint glow or none at all, and heats the surrounding tissues so much that it leads to necrobiosis."

The results of the surgical treatment of Besöld and Gidionsen were dependent on the general resistance of the patient, the severity of the local condition and the pulmonary disease, and finally on the correct and timely treatment. Of the 500 tubercular patients, 20 per cent were cured, and this lasted often eight to ten years.

As to the hemorrhage, which is supposed to be prevented by the galvanocautery, this is true only of the red-hot cautery, for the white-hot porcelain point does not prevent hemorrhage.

Why Grünwald was so afraid of artificial wounds could not be understood by the authors. On the contrary, they agree with other authors that this theoretic consideration was not borne out and that much oftener the artificial wounds very quickly were covered over and closed.

Friedrich (Kiel) in his last article opposes Grünwald's fear of injury to covering epithelium of the tubercular infiltrate.

Burger, in his last article on the importance of laryngeal tuberculosis, says: "Kronenberg's assumption that the results are dependent on chance does not seem to me permissible, because the most active, optimistic and restless champion of active treatment is always getting new results. And here, according to him, is the explanation of the distinct difference in the opinions of the writers. The surgical treatment demands not only a well developed technic, which, of course, is present in all the authors who have related their experiences, but it also demands a stock of patience, perseverance and faith. Whoever is scared off by a dozen disappointments and bad results and retires to the ranks of the nihilists, will have no correct judgment as to the possibilities of the surgical treatment. Entrance into this Holy Place is allowed only to believers. For the correct judgment of the value of this method, the hyperpessimistic, impatient and inexact therapist must be unconditionally excluded."

Everyone who has collected experiences extending over a long time in the surgical treatment of laryngeal phthisis, whether they be with cutting instruments or the cautery, will agree with Lermoyer, who has the following to say in regard to this method:

"In place of learning a new method, many find it easier to deny its correctness and results. Thus patients with laryngeal phthisis, who complain of fearful dysphagia, and are dying

of hunger, are treated with gargles instead of procuring relief for them by curettement."

In agreements with Spiess and Krause, I have practically never seen a tubercular infection of a wound. In order to prevent the purulent infection of a wound, I use an alcoholic malachite-green solution of 1 to 2 per cent and can heartily recommend this after eight years' use. The astonishing disinfecting power of organic dyes was discovered by Koch in 1880 and investigated further by Behring. He showed that this remedy far exceeds the action of sublimate on anthrax.

In 1890 Stilling introduced methyl violet under the name of pyoktanin. This preparation has the power of checking suppurations and preventing them without causing any irritation of importance. Bresgen, by experiments extending over a long time, showed the advantages of this treatment, and I can substantiate everything he says. By the correct use of pyoktanin, we are not only able to favorably influence infectious and inflammatory conditions of the throat and tonsils and even cure them, but what is of more importance, are also able to avoid, after bloody or galvanocautic operations in the nose, throat and larynx, an inflammatory reaction with all its sequelae, such as swelling, pain and suppuration.

I used pyoktanin for several years, until on the advice of Behring I gave the preference to malachite-green (Grübler). This drug has about three times the bactericidal power of pyoktanin. On some bacteria it has an almost specific action. For example, it acts against anthrax and the comma bacillus about one hundred times as well as against the typhoid bacillus. According to Lingelsheim, streptococci cultures are killed in two hours by a proportion of 1 to 700.

For these reasons I use this drug for after-treatment, after the curettement and galvanocautic treatment of tubercular ulcers and infiltrates.

The objections brought against this method of treatment are based on the following points: the malachite-green soils both physician and patient and sticks to linen and hands as green spots, which are hard to remove. In the larynx it causes a sensation of burning and dryness and has a taste, which to many is unbearable.

All these objections are of little importance when we consider its power of preventing inflammation, and must cause wonder that they are used as a basis for refusing its use.

If we understand it correctly, the objection is that malachite-green frequently stains the hands and laundry of the physician. The contraindication therefore is a purely personal objection to the loss of time in cleaning the spots.

Anyone who has used malachite-green for a long time and correctly, that is in fresh solution and proper dose, after operations on the mucous membrane of the upper air tract, will put into the background the inconveniences attending its use when he considers its very distinct advantages. By observing certain cautions, its bad features can be easily prevented. From my experiences I can give the following advice as to its use:

The malachite-green should be used only with a cotton-wound applicator, and only to the extent of a dark green coloration of the wound. Care must be taken to avoid an excess of the drug, by dipping the applicator in a vessel containing only enough fluid to be absorbed by the cotton. After the application the patient must neither cough nor spit. Only after some time may he take a drink of water. Many patients, however, on account of the bad taste, spit out the colored spittle at once, and stain their lips and chin. Cotton dipped in alcohol, will remove the stain. The patient must be warned not to spit into his handkerchief. In one's own interest, one should warn the patient not to cough, but if he does so anyhow, should be careful to get out of the way.

The well-known ink-spot eradicator (Weinstein's rods) removes the green color from the skin in a couple of seconds, as do ammonia and alcoholic potassium solutions.

When possible, the solutions should be made fresh, in small quantities, and kept from the light in dark bottles.

The first to use the galvanocautery in laryngeal phthisis was Voltolini. Discouraged by bad results he discarded this method.

Further experiments by Schaeffer, Pieniazek, Lublinski, Goughenheim and L. v. Schrötter gave relatively good results, but did not lead to its general use. A noteworthy article by S. Srebeny (*Medycyna*, 1893), who obtained cicatrization in almost every one of 13 cases, was not able to make it accepted, as the paper was published in Polish. In spite of my early bad results, observed in hospital practice, I have for 15 years used the galvanocautery, loop or point, in certain cases with

advantage, especially in tumor-like infiltrations and granulation formations on the false vocal cords and posterior laryngeal wall, not only in tuberculosis, but also in scleroma and syphilitic granulation products. In such conditions they have given me the best of results.

In comparing the galvanocautic with the purely surgical method, one point deserves special notice. Many writers claim that the use of the former in laryngeal phthisis demands a less degree of technic than the use of the cutting forceps. This view is erroneous. The correct use of the galvanocautery in the larynx requires a very exact technic and experience. The dosage of the heat is not so easy to learn as it is thought to be by many colleagues. Also, the form, length and thickness of the platinum point must correspond to the degree of destruction desired. All so-called galvanocautery knives must be discarded, to be replaced by double points, spiral points or small porcelain points. A complete severance of the infiltrated false cords with opening of the sinus and without burning or injury to the vocal cords demands a steady hand and a sure eye, and is technically as difficult as the use of Landgraf's double curette in this region. The same is true of all galvanocautic operations on the vocal cords, especially their inferior surfaces. Here, every excess is a direct injury to the cords, from doing which I would give the strongest warning.

The possibility of hemorrhage after surgical intervention must not be overlooked.

Its frequency and danger seems to me to be exaggerated. Mermod is the one who insists on this most strongly. In more than 10,000 cases there were about 6 fatal and 15 severe hemorrhages. A fatal one two hours after curettement (from an angioma) was observed in my division of the St. Rochus Hospital by one of my assistants. I, myself, have seen eight severe hemorrhages in 1000 curettements, all of which could be checked.

M. Schmidt reports a case of fatal hemorrhage (the autopsy showed an angioma as the source) and a long, severe venous hemorrhage, which was checked by loosening the constricting clothing. Mermod saw a hemorrhage, from the results of which the patient died several days later. Two severe hemorrhages happened to my assistant, Dr. Wroblewski, after excision of the sclerotic false cords. I, too, have seen prolonged

hemorrhages after operations on the false cords and the epiglottis, especially if the vein on the lingual surface was injured. I suspect that the number of copious hemorrhage is larger than is indicated by the literature, but I regard the wild fear of the many knife-shy colleagues as overdrawn and agree with Krause, who never saw a severe, unchecked hemorrhage in about 400 curettements, and who is disposed to refer it, when it does occur, to an improper technic. A few words here as to hemostasis. In parenchymatous hemorrhages, I use a 10 per cent cocain spray with an addition of adrenalin, followed by applications of small cotton tampons dipped in 5 per cent perhydrol. If it continues, a tampon dipped in a 20 per cent cocain solution is pressed against the bleeding area, and allowed to remain a half minute, followed by application of equal parts of lactic acid and liquor ferri sesquichloratum. In the case of small spurters (epiglottis) I apply, after thorough cocainizing of the bleeding area and pressing with cotton tampon dipped in perhydrol, the red-hot galvanocautery. Internally, secale cornutum is given. Also morphin for cough, ice collars, ice pills, absolute rest, speaking being forbidden.

In a case of dangerous hemorrhage from the false cords (scleroma laryngis) in a previously tracheotomized patient, I was compelled to use the double tampon by means of two tampons tied by ligatures. A double thread was passed by means of a Belocque's probe through the tracheal opening into the mouth and drawn outward. A small tampon was tied to the tracheal and a large gauze one to the oral end, both threads were drawn in opposite directions so that the smaller tampon was drawn through the tracheal opening below the vocal cords, while the larger was pressed against the introitus laryngis. After both had been fastened to the introduced tracheal canula, the hemorrhage was checked.

THE SURGICAL TREATMENT IS INDICATED.

- (a) In tubercular tumors of the larynx.
- (b) In circumscribed, chronic, tumor-like infiltrations of the posterior laryngeal wall, which show little tendency towards degeneration.
- (c) In chronic ulcers, resting on an infiltrated base and surrounded by granulation products, which resist other methods of treatment.

(d) In unilateral disease of the larynx, even when the epiglottis, false cords and aryepiglottic folds are involved.

IT IS CONTRAINDICATED.

(a) In severe pulmonary phthisis combined with malnutrition and wasting.

(b) In diffuse miliary tuberculosis of the larynx, or of the larynx and pharynx.

(c) In all cachectic conditions.

(d) In severe laryngeal stenosis caused by inflammatory swelling of the affected parts (here the quickest possible tracheotomy is demanded).

(e) In frightened, nervous, irritative, distrustful, listless patients and those who frequently change doctors, but especially in persons whose general condition promises little for cure.

The surgical treatment demands from the physician devotion to the patient, patience and great persistence, as well as the most complete knowledge of the technic and an exact, sharp instrument. It should as far as possible not be performed on out-patients. The greatest attention must be used in the after-treatment, and the patients should be under observation for months and often years.

The operation is very slightly painful, if the cocain has been used correctly.

The relatives as well as the patient should be told beforehand that the trouble in swallowing cannot be cured at once by the operation, that it is frequently made worse for some days afterwards, and that the performance of the operation only in exceptional cases brings about a radical cure of the larynx. Furthermore, it would be well to state that the removal of the infiltration is rarely possible at one operation; that in spite of the operation, relapses may occur in the larynx; and that the physician can give no guarantee of the eventual cure.

After 20 years' experience I can confirm the conclusions stated in my address before the International Congress at Berlin:

"In combined phthisis of lungs and larynx, surgical intervention can cure localized disease of the larynx and restore its function. Nevertheless, relapses are not always prevented,

whose further development on account of lesions in the lungs is not checked by the operation alone, without a corresponding general treatment, which latter must be always looked upon as the most important factor in the therapy."

I should like to add:

(1) The galvanocaustic treatment alone, or combined with surgical intervention, gives the best results in localized infiltrations and relatively good general condition.

(2) The fear of tubercular infection and severe hemorrhage is unfounded.

(3) Severe cases of laryngeal and pulmonary phthisis should be treated in sanatoria by specialists thoroughly trained in the technic.

As to the cure, I think only such cases should be considered cured where the larynx has regained its normal functions, i. e., vocal and deglutitive power, where the general condition and nourishment leave nothing to be desired, where the pulmonary process has been checked, where cough and expectoration have disappeared, and where this favorable result has lasted at least one year without a relapse. An observation of several months is insufficient to place such an improvement in the category of "cured" (Besold and Gidionsen).

THE EXTERNAL OPERATIONS.

Here belong:

(1) Tracheotomy.

(2) Laryngofissure.

(3) Extirpation of the larynx.

Tracheotomy was first recommended by M. Schmidt, not only as an *indicatio vitalis*, but also as a curative measure, though Schmidt, in his book, says that since he has come to use the surgical treatment more and more and perhaps with better technic, he is finding less and less occasion to recommend tracheotomy. A further contribution to this question is furnished by Henrici. He recommends it for children, in healthy or slightly affected lungs, and relatively benign cases of laryngeal tuberculosis. Mermod is against tracheotomy as a curative measure, and employs it only in very severe laryngeal stenosis.

In hospital practice I have seen several times a tubercular infection of the tracheal wound in decrepit patients, with sputa filled with bacilli. The fault lay on the poor appointment of my division, insufficient ventilation and malnutrition of the patient. I have observed the local infection of the tracheal wound much less frequently in private practice.

Laryngofissure and Extirpation of the Larynx.—According to Grünwald, they are indicated in those processes or localizations whose cure seems impossible by the endolaryngeal method. Especially in perichondritic processes and their relapses, and also in very extreme disease we must think of external operations.

The first radical operation for laryngeal tuberculosis was performed in 1870, unintentionally, however, as the diagnosis was carcinoma. In the course of the following 35 years Grünwald found only 93 similar operations.

A very careful, statistical review of the histories, which unfortunately were not exact in many cases, gave the following: 67 per cent died soon after the operation.

8 per cent died from a short time to one year afterwards.

17 per cent were cured temporarily, without any report as to the subsequent course.

Grünwald designated the laryngofissure as an operation not dangerous in itself, so that in the future we need not take into consideration death from the operation, since it is connected with no danger to life. There is, however, the danger of tubercular infection of the wound through contact with pulmonary secretion containing tubercle bacilli, just as was observed in tracheotomy. This condition happens rarely. It can be prevented by operating only in healthy tissue, by performance of the operation only after an upper tracheotomy, and finally by an immediate closure of the wound. As to the influence of the laryngofissure on the general condition, an exacerbation was noticed in many cases, though this is not to be regarded as a rule.

Another disadvantage for the patient can arise through the formation of stenosis. This happens when two opposing surface are apposed and grow together. It can be prevented if it is possible to avoid long contract of the surface of the wounds.

The conclusions drawn from his statistics are expressed as follows:

Even in the initial stages of a lung affection, especially when the larynx is greatly involved, one should by all means refrain from extensive operations.

Extirpation of the Larynx.—The indications for this severe and often fatal operation are very limited. It demands the most perfect technic and the greatest care in the after-treatment, independent of the instinctive aversion of the patient to this severe operation, although favorable results have been obtained in this field. This is shown in the wonderful demonstrations by Prof. Gluck before this congress. In five patients operated for laryngeal carcinoma, lasting cure for years was obtained with restoration of a relatively loud and distinct voice. The patients breathe without a canula, swallow without difficulty, look all right, and are able to carry on their occupations.

In regard to the *phototherapy* attempted by Stillman and L. v. Schrötter, introduced by Sorgo, and tested by Kimwald, Jessen and Baer, I have no personal experience. In certain cases favorable results have been obtained, but their number is too small for positive conclusions and comparisons with the more energetic treatments.

Probably electric light will replace sunlight. The method is trying on the patient. Jessen allows the patient to be illuminated 5 minutes, and repeats this every hour. Still, I would advise methods which yield quicker results in cases where two weeks have passed without any distinct improvement.

I consider it a great service of Dreyfuss when in a discussion in our congress he insisted that physicians should send their laryngeal phthisis patients to us at a time when they are still curable. "I know," says the author, "that under certain circumstances distrust is caused by propagandistic acts. It will be called an unfair advertisement, a hunt for practice. These belittling thoughts must disappear and those who utter them be silenced when we declare to others that we are acting in the interest of a higher than personal motive, when we say to ourselves that we are doing nothing more than our right and duty, and when we take counsel for the combating of the plague of tuberculosis."

When I read these sentences of true humanity, I involuntarily thought of my home city, where, with a few exceptions,

my attempts for years to introduce the surgical treatment has not only been fruitless but has been met by dead silence or discredited as injurious. I have never fawned on colleague or patient, never attempted to make everything alright and to swim with the current. The distrust of most colleagues for the surgical treatment is perhaps due to my own resignation and lack of patience in attempting to convince the principal opponents and their students. The present congress, which has given me the agreement of the most learned and skilled colleagues, will assist in removing the prejudices, help truth to victory, and bring to the unfortunate patient relief at least if not always a cure. As to the reproach that I am again bringing up a well-worn theme, I can answer with Goethe, "The truth must be continually repeated, for error is by the individual and by the masses."

Interest in this very important question has been again excited by the good results of Krieg, Mermoud, Grünwald, Besold and Gidionsen, and lately of Friederich of Kiel, obtained by the use of the galvanocaustic, or the combined method (curette and galvanocaustic). The brilliant progress in laryngeal surgery, as laryngotomy and extirpation of the larynx, bring us in certain cases to the more radical methods.

I will conclude with the words of Moritz Schmidt in his preface to Besold and Gidionsen's work: "My cures have risen from 2 per cent to 20 per cent. We must continue to struggle in order that the results may be still better. The progress in the surgical treatment under the best aseptic precautions give us hope that this attempt will be successful. Therefore, to further fight along the entire line!"