

leak, as to control the bleeding with an Esmarch bandage in the majority of amputations for diabetic gangrene. On the contrary, the bleeding is often intensified because a venous stasis is produced without an arterial obstruction. These are no mere theoretical inferences. I have repeatedly seen practical confirmation of these statements.

The amputation should be done as rapidly and as simply as possible and with a minimum amount of traumatism to the tissues. Ordinary circular flaps should always be used as they insure the best possible nutrition. One should avoid osteoplastic operations and above all the flaps should be left wide open and the wound lightly tamponed with gauze. If this last step is observed the flaps are not subjected to the tension of sutures or adhesive strips and the possibility of septic retention following the sloughing of the skin and fascia, which occurs in almost every case, is eliminated. Finally, the dressing should be loosely applied.

Dr. Garbat has suggested to me that autogenous vaccination might hasten the separation of the sloughs and healing. Although I regularly use the autogenous vaccine in diabetic carbuncle I have had no personal experience with it in the infections resulting from gangrene of the extremity. I believe that the suggestion of Dr. Garbat is worthy of trial and I shall make use of it at the next opportunity. Judging from my experience in diabetic carbuncle, one should be careful in vaccinating the diabetic patient and not use too high a dosage. The diabetic is very susceptible and I have seen very severe local reactions follow the injection of moderately high doses. I have even had a suppuration at the site of injection after the inoculation of 400,000,000 staphylococci.

It might be in place here to emphasize the fact that prophylactic measures are of the utmost importance. The same rules apply to all cases of diabetes with the slightest tendency to circulatory disturbances of the lower extremity before the development of any real lesion, as apply to those patients who really have a gangrene or an infection resulting therefrom. Above all the chiropodist should be shunned. Many patients date the origin of their active disturbance to the clumsy and septic manipulations of a pedicure. Garters and stiff, tight shoes should not be worn and all pressure must be avoided. The feet must be kept scrupulously clean. They should be bathed and powdered religiously. Extreme care should be exercised in not injuring them and in not permitting them to become frost-bitten. An insignificant scratch, a slight abrasion should receive competent surgical attention. Ulcers, corns, ingrown toe-nails, bunions, etc., should be treated by the surgeon.

The methods of producing active hyperemia detailed above should be begun before the gangrene sets in and continued after the patient is cured so as to prevent a recurrence.

I wish to say one word in conclusion relative to the effect of this method of treatment in other types of gangrene. I have applied it to cases of presenile, senile and embolic gangrene, but the results are by no means as satisfactory. Although occasionally demarcation is stimulated and the patient escapes without radical operation, these cases, as a rule, come to amputation, at least of the leg. I presume that the reason for the relative failure of the conservative treatment in cases that are not diabetic is due to the fact that the lesion is solely a circulatory one and that the circulatory disturbances are too extreme to be influenced. In diabetic gangrene, while the circulatory lesion is an important one, it is usually not of such a complete nature and the systemic

disease is at least partially responsible for the local trouble. Hence there is a chance of controlling the process in diabetes by improving the general condition, increasing the circulation in the extremity, and treating the wound itself according to the principles of aseptic surgery.

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ADVICE TO PATIENTS ON LEAVING THE HOSPITAL AFTER SURGICAL OPERATIONS*

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Comparatively little seems to have been written on this subject, in spite of its importance. The character of the advice will of course depend largely on the nature of the operation and of the condition for which it was done; but there are certain general considerations which will apply to the majority of cases unless some special contra-indication exists.

It was formerly customary to keep surgical patients in the hospital, and even in bed, for what is now known to be an unnecessarily long time, thus adding to their expenditures, decreasing their incomes, and consuming time which could otherwise be more profitably employed. The sum total of the loss to the community from this source was enormous. Gradually we have learned to reduce this loss of time, to the advantage of the patients and to the general advancement of surgery.

Surgical patients on leaving the hospital generally pass from under the observation of the operator, especially those living at a distance. Unless the surgeon takes the trouble to advise them, their future mental and physical welfare will depend on their own ideas and on the advice of those around them, including perhaps their family physician. Most patients have a very hazy conception regarding their conduct, their actions often being largely governed by groundless fears and traditions and by the advice of ignorant or oversolicitous friends. Even the family physician, if consulted, is not always a reliable guide, because of unfamiliarity with surgical questions or of lack of knowledge of the individual case. These things are unfortunate, and militate against the prompt and smooth mental and physical recovery which should be the aim of every well-conducted surgical procedure.

To the surgeon all seems simple enough. With his superior knowledge it is difficult for him to realize the fears and uncertainties of the patient suddenly thrown on his own ignorant resources; and hence his instructions, if he gives any, are too often hasty, meager and but imperfectly understood. I am convinced that the whole subject deserves more attention than has hitherto been accorded it.

The following outline represents my own idea of the situation, which may not accord with those of others, but which will at least serve as a basis for consideration and discussion:

The surgeon should take time to talk over with each patient, before he leaves the hospital, his present condition, his prospects and his future course of action, explaining also, within the bounds of reason and expediency, the exact nature of the operation performed. As abdominal operations are the most frequent, I shall con-

* Read before the Denver City and County Medical Society, Feb. 18, 1913.

sider the advice to be given in connection with these; most of this advice applies to other surgical procedures also.

The patient should be told, when this can conscientiously be done, that the operation was successful and that everything necessary was accomplished. It should also be explained, when true, that the abdomen was explored wherever there was likelihood of anything being wrong and that everything was in perfect condition. This is an important point for the patient's future peace of mind, and hence, according to the most modern principles of surgery, such exploration should be done when practicable. It is well to make this explanation as emphatic as circumstances will permit, no matter what exception it may be wise to make to relatives and friends. For instance, one is usually justified in saying:

"Everything is all right; not only in the region operated on, but in the rest of the abdomen you are in just as good condition as any one else. I know this to be true, because I have examined everything carefully. Even if you feel more or less pain and soreness in the future, you must not think that they mean anything more than the natural consequences of a surgical operation.

"You must bear in mind that an operation is a severe injury, just as much as if you had fallen from a horse or had been run over by an automobile. The skin with its many small nerves has been cut, and the muscles separated and more or less strained and bruised, which is certain to produce soreness and stiffness that may persist for a long time, but which mean little and should be disregarded as far as possible. A similar soreness and stiffness would result from severe and unaccustomed physical exertion, such as climbing a mountain, but it would cause no anxiety and you would be sure of its speedy disappearance. The division of nerves in the skin may give rise to various uncomfortable sensations, such as numbness, oversensitiveness and even actual pain in the scar; but these manifestations mean nothing, should be given but little attention, and will surely vanish in the course of time.

"All of these disagreeable symptoms are apt to be more pronounced at night, while you lie quietly in bed, with nothing else to occupy your attention. This is largely owing to the accumulation of gas within the bowels, which presses on the sore places from the inside much as if you pressed on them with your hand from the outside. If you do not bear this in mind you are apt to imagine that some dire calamity is fomenting within you."

In addition to some such talk as the above, it may be stated that the soreness following an operation is likely to occur in periods, brought on perhaps by overexertion, indigestion, barometric changes, etc., but that these spells signify little and should cause no mental uneasiness; that if they are regarded too seriously and with the idea that something is wrong inside, they may increase to such a degree that the patient becomes a nervous, hysterical semi-invalid—a nuisance to herself, to her physician, and to all those who are so unfortunate as to be associated with her. I say *her* because such cases usually occur in women.

The effects of this sort of introspection may advantageously be illustrated by referring to the fact that many medical students develop symptoms of the various diseases which they read of and hear about in their lectures. The patient will also get a better understanding of the situation if she will sit quietly down by herself, hold up her little finger in front of her and look fixedly

at it for fifteen minutes, concentrating her whole attention on it. Before the time has expired it is likely that the finger will be the seat of some very peculiar sensations, and there will be a strong tendency to give it a good rubbing. If this is true of a normal finger, how much more must it apply to the seat of an operation, with all the mysterious fears and uncertainties which surround it!

In order further to avoid the evils of introspection, the patient should be cautioned against describing the operation and the hospital experiences to curious friends. In fact the whole matter should be regarded as a more or less disagreeable episode, to be made little of and forgotten as soon as possible. In this connection the Germans have an excellent saying, *Schwamm darüber*—"sponge it out."

Emphasis should be laid on the fact that according to the mental attitude it is possible either quickly to overcome the effects of most operations or to nurse them along indefinitely, and develop a condition of semi-invalidism, by continuously "looking for trouble" and "making mountains out of mole-hills." Assure the patient emphatically that in your opinion she does not belong to this latter class of weak and nervous individuals, who are much to be pitied; but that you feel certain from your observation of her that she will conduct herself with sense and discretion and not allow herself to become hysterical and neurotic. It is often well to add that any nervous symptoms which may have bothered her in the past evidently had a good foundation, but that from now on there can be nothing to prevent her from rapidly regaining her normal equilibrium, and that you can easily see that she is one of those who are always cheerful, energetic and happy if only they have a fair chance.

Patients must be warned against trying to interpret their own symptoms; for even doctors, with their superior knowledge, cannot trust themselves to tell what is going on within their own bodies. Above all, allowance must be made for the advice and statements of friends. There is nearly always some woman who, without appreciating that she is doing harm, will fill the patient's mind with forebodings of disaster, such as the development of a hernia or the return of gall-stones or of a malignant growth. Especially is this true of the woman who opposed the operation and who consequently desires to be able to say "I told you so." Explain that these objectionable pessimists can know but little about the subject, and at best must base their predictions on very few observations; while your own opinion, as the surgeon in the case, is supported by the knowledge gained in operating, as well as by the dictum of the entire medical profession, grounded on years of experience and investigation.

ABDOMINAL SUPPORTERS

Patients are always anxious regarding the character of abdominal supporters and the length of time during which they should be worn. The laity, as well as many physicians, regard them as of so much importance that the surgeon is compelled to give them an undue amount of attention. It should, I think, be explained that these "belts" are really of little service, except as they may confer a sense of security and comfort, or when ptosis exists. If there is a tendency toward rupture it will occur in spite of the belt, a fact that is quite generally recognized among surgeons. There is, however, such a strong prejudice in favor of belts that it would be unwise to advise against their use, for if any trouble should

occur the surgeon would undoubtedly be blamed. Moreover most women are in the habit of wearing corsets and would feel uncomfortable without a support of some kind.

Fortunately a proper corset is just as good as a belt, or better. It should be of the long, "straight-front" variety and should be so laced as to push the whole abdomen upward. This may be done by employing two strings, the lower one being laced snugly and tied perhaps half-way up, while the upper one is fastened more loosely. It is neither necessary nor desirable to wear belts or corsets very tight. They should be used for purposes of support only and not for constriction and should never cause discomfort. No pads, bands or stays should ever rest directly on the incision; not only is such pressure useless, but also in recent wounds it may give rise to inflammation and pain, while in older cases it favors atrophy and weakening of the scar. I have often seen much distress caused by the pressure of a reinforcing band or a corset-stay. It should also be made clear that it is unnecessary to wear a supporter of any kind while lying down at night.

DRESSINGS

When patients leave the hospital they are generally still wearing some sort of dressing held in place by a many-tailed bandage. They should be told that this is merely for the purpose of protecting the delicate scar, no virtue being attached to the cotton and gauze, and that the whole thing may soon be removed. Until then it is unnecessary to wear an abdominal supporter, its place being filled by the bandage. When the gauze and cotton are discarded they may be replaced by a folded handkerchief, if the cicatrix is still tender.

It should also be stated that all danger of infection ceases as soon as the wound is healed. If this is not done, those who have had this danger constantly paraded before them while in the hospital may remain uneasy for many weeks, as I have often seen.

CONSTIPATION

Immediately following an operation it is usually necessary to employ cathartics freely, which naturally leads to constipation. If nothing is done to overcome this it may cause permanent impairment of the natural activity of the bowels, requiring a more or less constant use of drugs; hence it is well carefully to advise patients in this regard. There are doubtless many good ways of doing this, but I have found the following method efficient:

1. On awakening in the morning, before getting out of bed, knead the bowels deeply and thoroughly, following the colon, from the cecum to the sigmoid.
2. On arising drink a glass of cold water and take such calisthenics as are permissible under the circumstances, increasing these exercises as convalescence progresses.
3. Eat for breakfast such things as experience has taught are most likely to assist peristalsis—such as fruit and oatmeal.
4. Go to the water-closet as nearly as possible exactly at a stated time, the reason for this being that the bowels are "creatures of habit" and "slaves of suggestion." To those of regular habits the "suggestion" accompanying a certain time and place is sufficient to procure a movement; but if the time is allowed to pass on a few successive occasions, constipation results. Nothing should be

allowed to interfere with this regularity, and all mental and physical exertion should, as far as practicable, be postponed until after the visit to the water-closet.

5. Stay in the water-closet for fifteen minutes, by the watch, without straining—just waiting.

6. If the attempt fails, as it often does at first, it will then be necessary to give the bowels some assistance, not with cathartics, because the more cathartics one takes the more one requires, but by the injection of a few ounces of cold water from a fountain syringe, or possibly by the use of a glycerin suppository.

Most cases of ordinary constipation will yield to this régime in a week or two, although some are stubborn enough to require more elaborate methods. Occasionally hormonal, agar, vibratory massage, or even dilatation of the sphincter may be necessary.

DIET

The great majority of patients on leaving the hospital are in condition to resume their ordinary diet, but they are often afraid to do so unless informed of the fact, because they are convinced that some specific diet should follow every operation. The fact is, however, that convalescence is often retarded by a departure from customary habits of eating and drinking, which have become in a measure physiologic necessities.

There are, of course, certain cases requiring special systems of diet, which are often better prescribed by the physician than by the surgeon. For instance, in stomach cases the patient should be given a carefully prepared diet list and cautioned against overeating, while in genito-urinary cases the patients should be advised to drink water freely and avoid alcohol, etc., etc.

SOCIAL DUTIES, VISITORS, ETC.

Every operation means more or less nervous and physical strain, not only from the operation itself, but also from the apprehension and sleeplessness which precede and accompany it. The result is a decided loss of energy and resisting-power. Even prolonged rest in bed, without other cause, is productive of considerable weakness. Under these circumstances nothing is more exhausting to a convalescent than a too rapid resumption of social duties. Hence warning should be given against dinners, parties, receptions and theaters, and especially against receiving too many visitors and indulging in prolonged conversations.

As soon as one who has been operated on returns from the hospital, every acquaintance is curious to see the result and hear all about the operation, and the defenseless patient must again and again rehearse the whole experience in all its harrowing details. This is not only exhausting, both nervously and physically (no one knows how exhausting who has not been through it), but it also prevents the mind from getting into other and less morbid and introspective channels. In this connection it may be mentioned that one of the worst things a patient can do on leaving the hospital is to go to the home of a friend. This is nearly always a strain, because it entails certain social exactions which cannot be avoided and which interfere with that relaxation of body, ease of mind and freedom from obligations which are necessary to recuperation.

For all these reasons it is often desirable, when possible, for patients to go away and complete their convalescence in some interesting locality among strangers, surrounded by new scenes and free from the well-meant persecutions of their friends.

REST AND SLEEP

Too much stress cannot be placed on the procuring of sufficient sleep; but unfortunately this is often difficult to get, owing to nervous irritability and social activity. Patients should be instructed to retire early and also to lie down for a short time at least once during the day. They must also be warned against the excessive use of hypnotics, which should never be taken except under the direction of their family physician, because the drug habit is easily acquired under such circumstances and its effects are disastrous.

GOING UP AND DOWN STAIRS, RIDING, ETC.

Most people, for some reason, have an idea that it is harmful for those who have recently been operated on to go up and down stairs. In reality there is no danger in this except the danger of falling, which may, however, be considerable while the patient is still in a weakened condition.

Riding in almost any sort of a conveyance is nearly always permissible, providing the driver is reasonably cautious and the excursion is not too long. Street cars, railroad trains and sea-going vessels are seldom objectionable, although the question of seasickness must be considered. Horseback riding and bicycling must be approached with caution and should not be indulged in for at least a number of weeks, especially in cases of movable kidney or other forms of ptosis.

EXERCISE

This is of much importance and should be encouraged, although it should of course be appropriate and judicious in amount. The patient must be made to understand that no one ever gets strong by resting too much, and that exercise and fresh air within reason are quite necessary to a rapid and satisfactory convalescence. It is especially desirable that the abdominal muscles, weakened and injured by the operation, should be strengthened by carefully graduated calisthenics, beginning with the lightest work, which is cautiously increased until the normal tone is regained. It is better for the patient to do this slowly and carefully than to permit the muscles to remain weak and atrophied until some sudden and unavoidable strain results in serious damage. Massage is often serviceable and should be recommended more often than it is when the means of the patient permit.

RETURNING TO WORK

Most patients desire to know on leaving the hospital how soon they can safely return to their regular occupations. This is difficult to answer because it depends so much on the nature of the work. The tendency has always been to keep people idle too long, which is detrimental to them, physically, mentally and financially, and a loss to the community also. The idea should be to get them back to their avocations as soon as this can be done. It is often better, for instance, to permit a woman to resume within proper limits many of her household duties, rather than to insist that she sit around for weeks or months in enervating and useless inactivity.

In this connection it can be said that most abdominal wounds are as strong at the end of a month or six weeks as they will ever be; and other things being equal, the majority of patients can return even to quite heavy work at that time. If there is a tendency to the formation of a rupture it will come anyhow in spite of any reasonable care, so there is but little object in waiting longer. In appendix operations done with the gridiron incision the

time of probation may still further be curtailed, even to so short a period as three weeks in some instances. In cases of movable kidney the wait must be longer—say six to eight weeks—while hernia occupies an intermediate position.

Women should not be in too much of a hurry to resume the care of small children, although this is exactly what the average mother of such children is anxious to do. It is wise to try to convince her that it is good for the children and develops their character and independence to be with others for a time, and that she, the mother, can do them greater justice in the end by properly recuperating before she returns to them.

VARIOUS POSTOPERATIVE CONDITIONS

Adhesions.—The surgeon should not neglect to explain about adhesions, because if he does not mention the subject some one else will, and entirely wrong and disturbing notions may be the result. It should be explained that adhesions follow almost every abdominal operation, and that this is natural and proper. Nature has provided the omentum for this very purpose—to fasten together and protect internal wounds, just as we use adhesive plaster and dressings for similar purposes externally. It should be clearly understood that these adhesions are harmless, although they may pull uncomfortably for a time until they become stretched and adjusted to their surroundings. Also, it should be explained that, like the external dressings, they are usually temporary and that they tend to dissolve and disappear in the course of time.

The Eyes.—It is often desirable to direct attention to the eyes. If there is anything wrong with the accommodation of these organs, although the compensation may previously have been perfect, difficulty is apt to arise from muscular strain, following the weakening effects of a serious operation, which results in headache, dizziness and perhaps nausea. If these symptoms appear and persist, an oculist should be consulted.

Bathing.—Many patients are worried by an uncertainty as to when they may begin to take baths. It should be explained that "when a wound is well it is well," and that, other things being equal, they may begin bathing as soon as the wound is thoroughly healed and "dry"—usually in from two to three weeks after the operation.

Menstruation.—Unless something is said on this subject much uneasiness will result. It must be explained that irregularities of the menses often follow surgical operations; they may come too soon or too late, be too profuse or too scant, or even not appear at all for several months. Whatever occurs is of little importance and the function will adjust itself in the course of time without causing harm of any kind.

CONCLUSION

The preceding imperfect consideration of an important subject is of course merely suggestive; there are many points which have not even been touched on. Operations other than abdominal require individual instructions according to the nature of the case and the characteristics of the patient. For instance, where the skull and brain are concerned, it should be understood that mental exertion and excitement must be avoided for an appropriate length of time; in genito-urinary cases much water and other liquids should be consumed with the exclusion of anything containing alcohol or other irritating substances; in amputations, massage of the

stump should be recommended and attention should be directed to the occurrence and persistence of reflex pains and peculiar sensations referred to the absent foot or hand, which are often disturbing, especially if not correctly understood. Patients who have had rectal trouble, those, for instance, who have been operated on for piles, must be told to avoid for at least two weeks the passage of hardened feces, making use, for this purpose, of proper cathartics and of warm saline enemas before movements of the bowels, when this seems to be necessary.

THE PURITY OF COMMERCIAL SODIUM SALICYLATE*

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While certain manufacturers lay great stress on the superiority of sodium salicylate made from oil of wintergreen or oil of birch, examination of the various pharmacopœias discloses the fact that in laying down the requirements for sodium salicylate no stipulation or reference is made as to its origin.

Inasmuch as a considerable number of physicians have endorsed these claims the Committee on Therapeutic Research of the Council on Pharmacy and Chemistry of the American Medical Association undertook an investigation of the subject. Thus far two reports have been published: (1) the critical review of the literature by Eggleston,¹ which showed that in spite of the claims and intimations of some manufacturers the evidence in favor of salicylates made from natural oils is actually very slight and that the evidence against artificial salicylate is even less; and (2) the pharmacologic study by Waddell² which showed that there is no difference in the physiologic action of the synthetic and "natural" sodium salicylates. As a further contribution to this research the results of a chemical investigation are now presented.[†]

Salicylic acid was first obtained by Piria³ (1839) from salicyl aldehyd by treatment with alkali, and shortly after (1843) Cohours⁴ and, almost simultaneously, Procter⁵ found that it could be prepared from the essential oil of wintergreen (*Gaultheria procumbens*). Following these discoveries it was found that salicylic acid could be obtained from many other plants and chemical compounds. Although some physiologic experimentation was carried out with it, salicylic acid continued to be merely a laboratory compound and was introduced into medicine only after Kolbe's⁶ discovery of synthesizing salicylic acid from phenol came into use.

Kolbe (1860) prepared sodium phenolate from phenol and sodium hydroxid and, after drying the product, subjected it at 100 C. to the action of carbon dioxide. Then the temperature was gradually raised to 180 and sometimes to 220, near the end of the operation. In this method during the heating, about one-half the phenol

distilled unchanged, leaving in the retort a residue of basic sodium salicylate. The aqueous solution of this residue was treated with hydrochloric acid, yielding a precipitate of impure salicylic acid. The first portions of the precipitate were rejected as they contain resinous and coloring-matter; the subsequent portions were washed and distilled with superheated steam, resulting in a pure white product.

Kolbe's method was improved on by R. Schmitt⁷ (1885), who, by saturating sodium phenolate with carbon dioxide at a low temperature and then heating the resulting product to from 120 to 130 C. in a closed vessel, obtained by molecular rearrangement sodium salicylate without formation of phenol as a side product.

These last two methods of producing salicylic acid and salicylates caused the wider study and use of these compounds, and soon salicylic acid made from natural oil of wintergreen and that made synthetically from phenol were used in medicine.

The earliest available published statement regarding the presence of an impurity in salicylic acid was that of Almén⁸ (1877) who reported the presence of phenol in salicylic acid made synthetically from phenol. Shortly after this report Williams⁹ (1878) isolated from 15 to 20 per cent. of a foreign organic substance which possessed properties similar to salicylic acid and which Williams called "cresyl-salicylic acid." This product of Williams was later more thoroughly examined and identified as cresotic acid. Squibb¹⁰ (1883) stated that at that time even the better grades of salicylic acid contained from 4 to 5 per cent. of some impurity. Ewell and Prescott¹¹ (1888) devised a method for determining quantitatively homologous acids such as hydroxy-toluic and hydroxy-xylene acids in salicylic acid. Fischer¹² (1889) stated that the chief impurities met with in commercial salicylic acid were cresotic, parahydroxy-benzoic and hydroxy-isophthalic acids and that the melting-point of salicylic acid was appreciably lowered by the presence of small quantities of cresotic acid; he further described a test for the presence of cresotic acids in salicylic acid. Charteris and MacLennan¹³ (1889), as a result of animal experimentation, reported that salicylic acid made from natural oils was less toxic than that made synthetically. In the course of their paper they reported chemical work by Henderson, who was able to purify synthetic salicylic acid so that it possessed the same melting-point as that prepared from natural oil of wintergreen or birch. Although this product was apparently pure, its crystalline form was stated to differ from that of the natural acid. In the purifying process Henderson¹⁴ isolated some impurity which he considered responsible for the toxic effects reported by Charteris.

In 1890 Dunstan and Bloch¹⁵ took up the chemical examination of the product isolated by Williams and found both ortho- and meta-cresotic acids and in another specimen para-cresotic acid was found.

Using the method of Ewell and Prescott, Hesse¹⁶ (1891) reported salicylic acid containing from 30 to 40 per cent. of foreign acids. In 1907 Carletti¹⁷ published

*Contribution from the Chemical Laboratory of the American Medical Association. This investigation was undertaken at the request of the Committee on Therapeutic Research, Council on Pharmacy and Chemistry American Medical Association.

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2. Waddell: Comparative Investigation of the Effects and Toxicity of Sodium Salicylates of Natural and Synthetic Origin, Arch. Int. Med., December, 1911, p. 748.

†This paper with full analytical details will be reprinted in the annual report of the Chemical Laboratory.

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4. Cohours: Ann. d. Chem., xlviii, 60.

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