than normal, but full and bounding all along; throbbing was felt in the temples; the throat and nostrils were disagreeably dry; the sight was blurred and the pupils markedly dilated; the gait was staggering, and there was confusion of the senses; the face was flushed, and there was a tendency towards sleep, but the uncomfortable conditions prevented rest for any considerable time. In less than twelve hours all discomfort had passed off, and no ill effects remained. (Results have been detailed as they occurred, and without comment.)

All my experiments with scopolamine were conducted with the salt supplied to the profession by Messrs. Burroughs, Wellcome, and Co. The temperature at which the experiments on frogs were carried on was 65° F. In the cases where the salt was applied the heart muscle was moistened by normal saline solution, and a tablet of the named strength laid on the surface of the heart and allowed to slowly dissolve.

To gather up the various threads of our essay. Daturine and duboisine we might call impure atropine. The varying effects obtained by different observers in the case of hyoscyne and scopolamine may be accounted for on the supposition that neither is a definite base. Hyoscyamine we might further suppose to be identical with atropine. Atropine is the alkaloid of which we know most, and we might call it the fundamental or representative base; and our knowledge permits us to say at least that in hyoscyne and scopolamine we have a certain proportion of atropine along with a varying proportion of a conversion or decomposition product of atropine, and which one might call a tropeine.

Instead, then, of multiplying names, we should call atropine what is usually atropine, and get hyoscyne and scopolamine free from any admixture, and name the resulting products by names corresponding to hemiatropine. For my own part, as I have already said, my experience of hyoscyne, scopolamine, daturine, and duboisine has led me to think they differ little from atropine but other observers think different, and for this reason I have endeavoured to indicate the lines upon which investigations might be carried on, and by means of which we might arrive at the truth.

REFERENCES.

Y. B. P.=Year Book of Pharmacy. For hyoscyamine, Y. B. P. for 1880 and 1881. For duboisine, *Lancet*, 1878; *Pharm. Journ.*, 1878; Y. B. P. for 1881, 1885, and 1894; *Nouv. Rem.* 1893; EPITOME, BRITISH MEDICAL JOURNAL, March 23rd, 1895. For daturine, Y. B. P. for 1880, 1881, 1882, and 1885. For hyoscyne, Pavloff in *St. Petersburg Med.-Chir.-Dissert.* for 1889 and 1890; Y. B. P. for 1892 and 1893; O. Hesse, in *Liebig's Annalen*, cclxxvii, 304, 308. Sharp, in *Practitioner* for January, 1894. For scopolamine, Y. B. P. for 1890, 1892, and 1893; O. Hesse, in *Liebig's Annalen*, as under hyoscyne; O. Hesse, in *Apotheker Zeitung* for 1895; Raehlmann, in *Semaine Médicale* for 1893; Bokenham, in BRITISH MEDICAL JOURNAL for 1894, vol. ii, p. 597; T. R. Pooley, in *Canadian Lancet* for January, 1895. (The abstracts of the Year Book of Pharmacy are so full and so exact that, in order to lessen the labours of those who wish to examine the literature of the subject, I have largely quoted that work.)

LORETIN: A NEW ANTISEPTIC.¹

By HERBERT SNOW, M.D.LOND., ETC.,
Surgeon, Cancer Hospital.

LORETIN is an organic iodine compound, discovered by Professor Claus, of Freiburg. Its formula is $C_9H_4IN.OH.SO_3H$, and its euphonious proper title in chemical nomenclature meta-iodo-ortho-oxyquinoline-ana-sulphonic acid. It is a bright yellow odourless crystalline powder, very slightly soluble in water and alcohol; cold water takes up 1 to 2 parts per 1,000, boiling water 5 to 6; it is insoluble in ether and oils, forms emulsions with the latter and with collodion. Being an acid it forms neutral salts with sodium and potassium, with ammonium and magnesium, which are readily soluble in water, forming solutions of a deep orange-yellow colour; the neutral calcium and barium salts are only slightly soluble. The manufacture process consists in boiling together in water equal parts of potassium iodide, potassium carbonate, and oxyquinoline-sulphonic acid with chloride of lime, representing one atomic equivalent of chlorine. After cooling a little hydrochloric acid is added. Thus is formed the calcium salt of loretin, which is again decomposed with hydrochloric acid to obtain the crude drug,

subsequently carefully purified. The pure acid is extremely stable for an iodine compound, being unaffected by prolonged exposure to air or even to direct sunlight; it is easily decomposed only by oxynitrogen compounds, by free chlorine and bromine, or by certain organic compounds already undergoing decomposition.

Ammelburg administered, for several weeks in succession, loretin to dogs in doses up to 10 g., rabbits to 5 g. Hypodermic injections amounting to 5 c.cm. of a 5 per cent. solution of the sodium salt of loretin, were made daily into guinea-pigs for long periods. In no case did any objectionable symptoms follow; and in the urine, which was carefully collected by means of specially constructed cages, no iodine, blood, sugar, or albumen. These physiological experiments were continued by Professor Albrecht in the Veterinary High School at Munich, the results being published in the *Deutsche Zeitschrift für Thiermedizin und vergleichender Pathologie*, 1894, vol. xx., p. 353.

Ammelburg's bacteriological investigations proved loretin to be a powerful microbicide, much superior to iodoform, with which comparison more particularly holds weight. They deal with the micro-organisms of cholera, anthrax, suppurative, typhus, etc. Some of the more significant tables are appended; the experiments are being still continued.

Schinsinger has extensively used loretin for burns and operations of all kinds, including empyema, herniotomy, resection of the upper jaw, arthrotomies, carious and tuberculous processes, etc.; in six months he had not a single instance of toxic symptoms, much less of death. Feussling has largely employed it in veterinary practice, with the most favourable consequences. The former remarks: "The absolute absence of any irritant effect upon the skin is a very important advantage. Artificial erythema or eczema I have never yet observed caused by it; but, on the other hand, very persistent eczema has been cured by loretin." Extensive burns were healed by dusting with loretin, and left very slight scars.

Loretin is recommended for use as a dusting powder, either alone or mixed with calcined magnesia, starch, or French chalk; as collodion (2 to 10 per cent.); in pencils of cocoa butter (5 to 10 per cent.); in ointment, 5 to 10 per cent., with vaseline or lanoline; in solution of 0.1 to 0.2 per cent. of the free acid, or 1 to 2 per cent. of the soluble sodium salt; lastly, as gauze impregnated with precipitated calcium salt. My own experience is confined to the powder, which I have never found occasion to mix with any other substance. Dusted on the skin, or over a granulated wound, this causes not the slightest irritation or unpleasant sensation. It immediately destroys the maldour of the most fetid cancerous sore, controlling this in a manner which no other agent I have yet tried will do. Copiously puffed with an insufflator into the deep cavity formed by evacuating the axilla of carcinomatous glands, it efficiently precludes suppuration, even when free hæmorrhage has taken place after the closing of the wound, an occurrence almost inseparable from anæsthetic vomiting when the patient has been removed from the operating table. Not the slightest bad symptom from its employment in this way has so far been detected. When there is no deep cavity a wound dusted with loretin heals rapidly by first intention. I have had recourse to loretin in some 60 cases, mainly operations on the breast and axilla, notoriously a test region for antiseptics. In my hands it has proved an ideal antiseptic and deodorant, with no single drawback; and I am sure that no surgeon who has once tried it will ever again resort to the noisome and toxic iodoform, from the free use of which I have seen more than one death. Though whenever old-established agents answer sufficiently the purpose I have a strong prejudice against novelties, yet this substance—non-poisonous, devoid of smell, and absolutely preventive of suppuration—seemed to me so marked an advance upon anything previously brought forward, that I felt constrained to direct thereto the notice of the Section.

APPENDIX (Abstract of Dr. Ammelburg's Bacteriological Experiments).

In each 20 c.cm. of a solution or mixture containing 2 per cent. of one of the following disinfectants was employed: beta-cresol, lysol, carbolic acid, loretin, iodoform, as well as a control experiment. In some cases 20 c.cm. of a 2 per mille

¹ Read in the Section of Pharmacology and Therapeutics at the Annual Meeting of the British Medical Association held in London, July-August, 1895.

loretin solution, or a 1-2 per cent solution of loretin-sodium. To each 20 c.cm. three drops of a bacteria culture or of pus were added repeatedly shaken and allowed to stand twenty minutes. With each of the mixtures four test tubes, containing sterilised gelatine broth were then inoculated in the following way: to the first 1 c.cm. of the infected antiseptic solution, to the second and third each $\frac{1}{2}$ c.cm., and to the fourth $\frac{1}{4}$ c.cm. was added by means of a pipette, thoroughly mixed and poured upon plates (4). (For the sake of brevity the experiments with lysol, beta-cresol and carbolic acid are mostly omitted):

TABLE I.—*Cholera (Pure Cultivation).*

Loretin, 2 per cent.	Loretin, 2 per 1,000.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	<i>Nil</i>	Very few	Numberless (Zahllose) colonies	4th day
"	"	Numerous (Zahlreiche) colonies	Numberless (Zahllose) colonies	6th day
"	"	Numberless	Numberless (Zahllose) colonies	10th day

TABLE II.—*Staphylococcus Pyogenes Aureus (Pure Cultivation).*

Loretin, 2 per cent.	Loretin, 2 per 1,000.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	<i>Nil</i>	Scattered colonies	Numerous	3rd day
"	"	Numerous	Very numerous	8th day
"	"	Countless	Countless	10th day

TABLE III.—*Anthrax (Milk Bouillon).*

Loretin, 2 per cent.	Loretin Sodium, 1 per cent.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	<i>Nil</i>	Scattered colonies	Countless colonies	3rd day
"	"	Numerous	Countless colonies	6th day
"	"	Numerous	Countless colonies	9th day

TABLE IV.—*Bacterium Coli (Pure Cultivation).*

Loretin, 2 per cent.	Loretin, 2 per 1,000.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	Numerous, about half as many as in the iodoform experiment	Numerous	Countless	4th day
"	Ditto	"	"	9th day
"	Ditto	"	"	12th day

TABLE V.—*Typhus (Pure Cultivation).*

Loretin, 2 per cent.	Loretin Sodium, 1 per cent.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	Numerous	3rd day
"	Very few	Fairly numerous	Countless	7th day
"	Numerous colonies with retarded growth	Fairly numerous	"	11th day

TABLE VI.—*Streptococcus (Pure Cultivation).*

Loretin, 2 per cent.	Loretin Sodium, 1 per cent.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	Numerous	3rd day
"	"	"	Countless	8th day
"	"	"	"	13th day

TABLE VII.—*Pus from very Infectious Carbuncle, containing Streptococcus and Staphylococcus.*

Loretin, 2 per cent.	Carbolic Acid, 2 per cent.	Iodoform, 2 per cent.	Control Plates.	Date.
<i>Nil</i>	Retarded growth of streptococcus	Retarded growth of streptococcus	Very numerous colonies of both kinds	3rd day
"	Numerous colonies of retarded growth (streptococcus)	Numerous colonies of retarded growth (streptococcus)	Very numerous colonies of both kinds	6th day
"	Numerous colonies of retarded growth (streptococcus)	Numerous colonies of retarded growth (streptococcus)	Very numerous colonies of both kinds	10th day

THE GENERAL THERAPEUTIC EFFECT OF THE ALTERNATING ELECTRIC CURRENT OF HIGH FREQUENCY AND OF HIGH TENSION.

Dr. G. APOSTOLI (Paris), together with Dr. Berlioz, on March 18th, 1895, presented a paper on the above-mentioned subject to the Academy of Sciences of Paris. He now, after longer and riper experience, desires to present a summary statement of his general conclusions: (1) According to Professor d'Arsonval's discoveries alternating currents of high frequency and of high tension exert a powerful action upon all living bodies submitted to their inductive influence. (2) The best methods of applying these induced currents is to place the patient, free from all contact with electrodes, in the circuit of a large solenoid traversed by the currents. The patient being thus completely insulated, the currents, which circulate in his body by auto-conduction, have their origin in his tissues. The body plays the rôle of a closed induced circuit. (3) By this method the physiological discoveries of Professor d'Arsonval are confirmed, and we are able to prove the powerful influence of these currents upon the vasomotor system, although they produce absolutely no sensation, and although they have no apparent effect upon the motor or sensory nerves. These currents have nevertheless a powerful action upon all the nutritive functions, as has been verified by Dr. d'Arsonval's numerous analyses of the gaseous products of respiration, and by Dr. Berlioz's not less numerous analyses of the urinary excreta. (4) The general therapeutic applications to be deduced from this physiological action are confirmed by clinical observation. Dr. Apostoli has now treated more than a hundred patients by this method at his clinic and at his private consultation rooms. The greater number of these patients have been greatly benefited by this new treatment, which, be it remarked, has been used to the exclusion of all other forms of medication, dietetic or otherwise. (5) These currents exert in the majority of cases a most powerful and generally beneficial action upon diseases due to slackening of the nutrition by accelerating organic exchanges and combustion. This is proved by analyses of the urine made by Dr. Berlioz, of which the following is a brief summary: The quantity becomes more normal; the products of organic waste are better eliminated. The increased combustion is shown by the diminution of uric acid, while the percentage of urea is generally increased. The relative proportion of these two substances changes under treatment so as to reach in general the figure of 1:40. The elimination of the mineral products is also affected, but to a less marked extent. (6) When daily séances are given, each lasting fifteen minutes, we may generally observe in patients submitted to the influence of

these currents the following modifications in their general condition. We mention them in the order of their occurrence: Return of sleep; increase of strength and vital energy; increase of gaiety, of power for work, and ability to walk; improvement of appetite, etc.; in short, general progressive improvement. This general improvement often manifests itself after the first *séances* before any local influence is apparent, and before any change has occurred in the urinary secretions. (7) Local pain and trophic changes are often more slowly affected by these currents, and at times they are entirely refracted for a longer or shorter period. In such cases the same currents must be applied locally by contact with the electrodes. This subject will be treated later on in a separate communication. (8) The diseases which have appeared incurable by this treatment are those not associated with well-defined organic changes, such as hysteria and certain forms of neurasthenia. Dr. Apostoli has also observed that certain localised neuralgias are refractory to this form of currents; they require its more direct local application. (9) The diseases which have derived most benefit from this therapeutic agent belong to the arthritic class, rheumatism and gout. (10) In certain diabetic subjects the sugar has disappeared altogether from the urine under the influence of these currents, while in others there has been no such change, notwithstanding the manifest and constant improvement in the general condition. Is this difference due to the imperfection of the electric apparatus or to the manner of its application? It is hoped that further experience will soon afford an answer to this question, although the fact that diabetes has many different causes may in itself explain the difference in the results obtained by this treatment. (11) In conclusion, the currents of high frequency and of high tension introduced into electrotherapeutics by Dr. d'Arsonval greatly increase the field of action of medical electricity. They furnish general medicine with a new and valuable means of treatment, capable of modifying more or less profoundly the processes of nutrition.

THE PHARMACOLOGICAL ACTION OF BERBERINE.

Dr. C. D. F. PHILLIPS read the following paper, founded on experiments undertaken by him in conjunction with the late Dr. Herbert Ashdown in the physiological laboratory at University College, London: Berberine was first obtained from the bark of the *xanthoxylum clava Herculis* L. by Chevallier and Pelletan¹ in 1826, and named by them *xanthopierit*. Buchner² in 1835 isolated from the root of the *berberis vulgaris* an alkaloid, to which he gave the name *berberine*, and Perrins³ in 1862 showed that these two substances are identical. Since then it has been found in *calumna* root, in the rhizome of *podophyllum peltatum*, of *hydrastis Canadensis*, and in a number of other plants belonging to different natural orders. When pure it occurs in yellow acicular or prismatic crystals, having a bitter taste and neutral reaction, readily soluble in boiling water, very slightly so in cold water. Its salts are also yellow in colour and very insoluble in cold water. Previous researches have shown that $\frac{1}{2}$ to 1 g., administered hypodermically to rabbits caused death after some hours, with muscular tremors, paresis, especially marked in the hind limbs, and great embarrassment of the respiration. The alimentary canal was not distinctly affected when the substance was given subcutaneously. In dogs 2.75 g. by the mouth produced symptoms of severe gastro-intestinal irritation, abundant watery and mucous diarrhoea, marked salivation, general muscular tremors and paresis. The respiration was not markedly affected. After death the spleen was found to be much contracted, as also the whole intestine, and the abdominal organs generally much congested; the heart contracted. Cursi has pointed out in an elaborate series of observations that locally its action is very irritating, and readily causes chronic inflammatory thickening. Berberine exerts a very decided action on the alimentary tract when given by the mouth, but when given hypodermically so much irritation is caused locally, and such large quantities of fluid are required to dissolve it, that the slowness of its absorption renders its action very uncertain. In rabbits and dogs the first manifestations after medium doses are profuse salivation with

loose motions, followed by severe watery diarrhoea and colic, great thirst and muscular tremors also occur. After death from an overdose the intestines are found very much contracted, generally empty or containing an abundance of mucous and watery fluid, the mucous membrane being much inflamed. There does not appear to be any direct action on the liver, as there is no increase in the quantity of bile produced, but the gall bladder is usually found contracted. When applied to the heart of a pithed frog *in situ* the effect is not very marked. A solution of 1 in 400 produces a slight slowing, the systole being prolonged and the diastole apparently less complete; with stronger solutions stoppage occurs in systole. Observations made on the detached heart with Williams's apparatus showed that 1 part of berberine in 5,000 parts of circulating fluid slows the heart and strengthens its contractions, the rhythm remaining perfectly regular, and the general character of the beat being unaltered. The blood pressure is a little increased, or may be unaltered. Larger doses (1 in 2,500) slow the beat very considerably, the systole becoming more prolonged and the diastole less complete. The pressure may be increased at first, but symptoms of cardiac failure soon begin to appear, with irregularity of action and a rapidly falling pressure, until death occurs with the heart in systole. The action on the heart of warm-blooded animals appears to be very similar to that just described in the case of the frog. Intravenous injection of 0.025 to 0.03 g. in cats, dogs, and rabbits causes an immediate and rapid fall in blood pressure, with great slowing and more or less irregularity of action. These effects, however, are transient, the pressure soon returns to normal, and then rises somewhat above it. During the period when the blood pressure is rising, irregularity of the heart's action, if it has not previously occurred, is generally more or less pronounced, and, though lasting only a few seconds at a time, recurs at intervals. This effect, however, seems to be due rather to stimulation of the cardio-inhibitory centre in the medulla than to any direct action on the heart itself, since the irregularity never occurs if both vagi be divided. The rise of blood pressure which succeeds the primary fall is apparently due to the vasomotor centre being thrown into action and causing a constriction of the peripheral arterioles throughout the body. It does not occur if the spinal cord be divided high up in the neck, the scarcely appreciable rise which then takes place being explained by the contraction of those vessels of the head and neck, the connections of which with the centre in the medulla are still left unsevered. In this series of experiments the heart was found to have stopped in systole, although Guenste⁴ and Falck⁵ state that in rabbits they generally found it dilated and engorged. The left ventricle is always contracted and empty, but a small amount of blood may be found in the right side of the heart. Berberine does not appear to exert any marked effect upon the respiratory system, excepting in the case of rabbits, which appear to be more susceptible. In them small doses injected into a vein cause a gentle excitement of the centre in the medulla, and this, increased in its activity, manifests itself by the respiratory movements becoming quickened. Large doses cause respiratory embarrassment to a very considerable extent, great irregularity, occurring not only in the frequency but also in the fulness of the inspiratory efforts. The serious cardiac and vasomotor disturbances, already alluded to as being produced by the exhibition of this drug in quantity, render it impossible to recognise how much of the respiratory embarrassment may be due to a direct action on the centre in the brain alone, or to the vascular disturbance. That the action is directed rather upon the medulla than upon the terminations of the vagi in the lungs is readily recognised, since the influence upon the respiratory functions is still well marked, even after both vagi have been divided. The methods employed to appreciate any special action that this drug might exert upon the function of the kidney were the following: First, to collect and measure the quantity of urine secreted by the kidneys for several hours previous to the exhibition of the drug, and then to observe the alteration in the quantity of urine eliminated during and after the intravenous injection of different solutions of berberine. This

¹ *Jour. de Chimie Méd.*, vol. ii., p. 314.

² *Report Pharm.*, vol. lii., p. 1, vol. lvi., p. 177.

³ *Jour. Chem. Soc.*, vol. xv., p. 339.

⁴ *De Columbino et Berberino Observationes*, Marburg, 1851.

⁵ *Deutsche Klinik*, 1854.

was readily ascertained by placing a cannula in both of the ureters and collecting the urine as it was secreted, this method being much more reliable than that of emptying the bladder at stated times, as it is always difficult to ensure complete evacuation of its contents in living animals. And, secondly, to record by means of the oncometer any alterations in the volume of the organ, collecting and measuring the urine at the same time. The influence that berberine exerts upon the urinary flow does not appear to be a very pronounced one. It does, however, cause a slight increase in the quantity of urine eliminated, even after the injection of small quantities of solutions into the venous circulation, quantities not sufficiently large in themselves to cause any increase in the urinary flow apart from the action of the drug. By studying the condition of the organ by means of the oncometer, and at the same time collecting the urine secreted, the conclusion was come to that the increased diuresis is dependent rather upon the elevation of the blood pressure brought about by the drug than by any direct stimulation of the renal cells themselves. The volume of the organ as registered by the oncograph is found to follow very closely the variations in the blood pressure. After intravenous injection, when the blood pressure falls, the kidney contracts and becomes smaller; at the same time there is diminution in the urinary flow, and again when the pressure gradually again returns to, and rises above the normal, the volume of the kidney increases to a greater size than previously. Although the diminution in bulk is synchronous with the lowering of the blood pressure, the subsequent increase does not precisely correspond in point of time with the rising pressure, but rather is a little delayed, and is prolonged over a longer period. The period of greatest activity of the kidney is during the state of full distension, the urine may then flow sometimes twice as fast as prior to the injection. By repeating small doses with sufficient frequency a state of almost constant contraction of the organ may be brought about, and thus a diminution in the urinary flow. Berberine cannot therefore be said to have any very marked action upon the kidneys themselves as a special diuretic, though it undoubtedly does cause under ordinary conditions an increase of the urinary eliminative processes. As has already been stated, after death the spleen is found to be very much contracted, but if the organ be studied during life with the oncometer it is seen that this organ follows much the same course as the kidney, diminishing in size with the fall in pressure, and again expanding when the pressure has risen. This latter effect—expansion—however, does not occur at the same time as the rise in pressure, but comes on gradually a little later, and after a short duration the organ again contracts to a little less in size than the volume previously occupied, and thus the spleen is a little smaller after each dose, until finally it becomes very markedly contracted, and will no longer respond except by a further contraction to the subsequent administration of the drug.

SCIENTIFIC MASSAGE.

Dr. F. CHURCHILL read a paper on this subject. After some introductory remarks on the proper use of massage and the kind of cases in which it was likely to be beneficial, he said that, while approving generally the accustomed methods of dry massage by kneading, rolling, and local friction, he did not object to the employment of local remedies. The inunction of soothing liniments in certain obstinate and painful cases would greatly facilitate the employment of other methods of treatment. The cutaneous tissues, contracted and hardened by long confinement, became supple and elastic, and the deeper structures participated in this. He often ordered the liniment to be warmed at the fire before use, as this would help to give a glow to the vascular system, was a sedative to the cutaneous nerves, and favoured inunction to the deeper structures. For the efficient carrying out of the "movement cure" it was necessary to abandon the use of machines and apparatus which the patient was taught to rely upon for communicating external activities to his torpid muscles. By skillful, well-tutored, and firmly-applied manipulation it was possible to arouse the slumbering activities of vital organs by energising the natural motive powers of the individual, so that the confirmed invalid became gradually self-reliant, and kept within the range of undue

fatigue. By scientific massage was to be understood the application of well-trained fingers to the groups of muscles or tissues requiring special manipulation, endeavouring to promote the flow of blood and lymph plasma, and to accelerate the metamorphosis of tissue in the disorganised part. Much depended upon the patience, skill, anatomical knowledge, and proper appreciation of the actual mischief requiring to be rectified by systematic daily application of massage. The manipulator must have a soft, warm, and well-padded hand, carefully trained to use the needful amount of pressure required in each case, according to the properly-defined prescription of the medical attendant. There must be accurate knowledge of the anatomical situation of the attachment of muscles, the course of the arteries and veins, and the situation of the nerves. The masseur should have a general idea of the structure and function of the alimentary canal, especially the course of the colon and the situation of the liver and gall bladder. He should be warned of the danger of using massage without skilled directions as to the details of manipulation required. The effect of massage was to improve the circulation, to increase the nutrition of the part, to remove accumulations, adhesions, and inflammatory products; to promote health and vigour; to increase the appetite, and in so doing to act as a general tonic to an enfeebled constitution; to increase the electrical contractility of muscular tissue; to raise the temperature of the body, and to increase the flow of lymph in the lymph channels and glands. When one remembered the wide distribution of the sympathetic nerves, the regulating control which they exercise over the abdominal organs, the large splanchnic nerves being situated at the back of the abdomen, contributing branches of communication to the muscular coats of stomach and bowel, it could not be doubted that the influence of these nerves upon the hollow viscera and their contents must be largely increased by inhibitory and excito-motor action, when stimulated to contract by efficient massage. For dyspepsia and functional disorders of the alimentary canal massage might be applied with advantage, as it increased the flow of gastric and biliary secretions. It was eminently successful in the case of anæmic and hysterical girls with sluggish circulation and indolent habits; also in infantile paralysis, gout, rheumatism, writer's cramp, etc. In the Weir-Mitchell treatment, which was designed to promote active nutrition of internal organs, scientific massage was an essential part of the treatment. Patients suffering from corpulence and what was now known as neurasthenia were greatly benefited by massage over the back, spine, and abdomen. In cases of neuralgia of the spine, face, and limbs the local pain was much relieved by *tâpement* or *pétrissage* over and around the painful part. Dr. Churchill related some cases, limiting them to those patients who had been certified by their medical attendant as depending largely upon manipulative treatment for efficient cure.

I.—A ponderous Scotchman, 6 feet in height, and weighing about 16 stone, was alighting from a hansom cab at London Bridge Station late one evening after excessive indulgence in his native mountain dew—a by no means rare occurrence with him. He stumbled and fell heavily on to his left ankle. When picked up he was taken back to his home in South Kensington, having sustained a severe sprain of the ankle with fracture of the internal malleolus. Dr. Ridge Jones requested Dr. Churchill to take charge of the case. He found the limb very much swollen, with much extravasation of blood around the ankle, effusion into the joint, the patient complaining of much pain. He ordered evaporating lotions to be applied to the leg. The limb was placed on a Liston splint with adjustable foot piece. The patient remained under treatment for several weeks. Owing to his luxurious habits and the swarthy condition of his body generally, the effusion around the ankle did not subside; the torn ligaments and tendons became matted together, and the joint quite stiff. Dr. Churchill engaged the services of a skilled masseur, and superintended the treatment. Considerable pressure was required to break down the agglutinated tissues and to promote active absorption of the extravasated blood. The patient ultimately made a very good recovery.

II.—A young girl, 18 years old, still growing rapidly, was playing at lawn tennis, when, with a sudden lunge forward, she felt something give way in her spine. She was put to bed and attended by Dr. Hewer, of Stoke Newington. Mr. Adams was called in, and he treated her for slight displacement of the third lumbar vertebra with effusion into the sheath of the erector spinal muscle at this part. She came to Dr. Churchill some months after and he could detect some thickening and effusion in this situation, with some local tenderness. There was a hæmic murmur at the base of the heart, and she had some menorrhagia. The pupils were much dilated. He treated the constitutional symptoms with arsenic and digitalis. For local treatment he ordered a reclining board for the spine, a firm flannel binder, and massage to the spine; also warm sea-water baths and massage directly after the bath. Her health considerably improved, and she made a good recovery.

III.—A middle-aged lady, married ten years, during which she gave birth to eight children in rapid succession, with two sets of twins and some miscarriages. She had been under Dr. Churchill's care for several years, coming up from Sussex for the London season. She was ordered to Bournemouth for her health, and he met Dr. Embleton in consultation there. She was suffering from neurasthenia and feeble circulation. Her body was well nourished and her general condition good. There was nothing to indicate organic disease. The heart was fairly sound, with slight dilatation of the right ventricle. She suffered from insomnia. They arranged for her to have a thorough course of massage by a skilled rubber. After some months of this treatment she returned to Sussex very much benefited by the treatment. Dr. Churchill placed her under strict régime of diet, baths, and regular habits of going to bed early.

Dr. Playfair in his book on *Functional Neuroses* remarks that in neurasthenic patients "drugs, pessaries, uterine treatment, hydropathic establishments, and health resorts, have been tried in vain." "But a scientific and rational means of dealing with such illnesses rarely fails to effect a cure in well selected cases." The cases in which the Weir-Mitchell treatment had proved eminently successful were nervous exhaustion without organic disease, hysteria, habitual use of narcotics, etc. In prescribing massage it was essential to make a clear distinction between collapse of nerves and hysteria. In the former one was able to trace the origin of the illness to some definite shock or exhausting malady which had for the time prostrated the patient; whereas hysteria was due to functional disorder from emotional causes and degeneration of moral and mental stamina. When writing on "high pressure education" he referred to the breakdown of physical health from overstrain in competitive examinations, and the too close application to study, producing complete prostration of nerves. The neglect of hygienic measures for the proper ventilation of schoolrooms, and failure to provide a daily allowance of active exercise out-of-doors frequently induced a breakdown of health, the result being a constant feeling of weariness and fatigue. The appetite gradually failed; dyspepsia, flatulence, and constipation followed in due course. Fine constitutions had been wrecked by neglect of physical education. In such cases massage might prove of great value. As regards indulgence in narcotic drugs, it was astonishing how patients acquired the habit of gradually increasing the dose until the nervous system was quite broken down. It was by prompt isolation of such cases under direct supervision and management by dieting and regular habits, combined with effectual massage by a competent nurse, that a speedy cure was effected. There were numerous kindred cases of *malades imaginaires* that it was well to leave to their own resources. These were melancholic dyspeptics who lived in affluence, were well nourished, and surfeited with the luxuries of life. Such people were self-centred, and much enjoyed their invalidism, though they would be the last to confess it. They made no effort to rid themselves of their vicious surroundings. They were pampered by their husbands, spoilt by their friends, and sometimes fussed by their doctors. For such cases there seemed little hope unless by the strict régime of the Weir-Mitchell system, (1) isolation, (2) massage, (3) systematic feeding, (4) moral training, and (5) outdoor exercise. Accepting these views of the scientific application of the movement cure for the relief of deep-seated pain and deep-seated mischief about a joint, how essential it became to keep the sufferer under constant supervision so that the varying amount of pressure and inunction of appropriate remedies might be prescribed according to the particular circumstances of each individual patient, with a definite determination to restore the activities of the crippled limb if possible. The rationale of all scientific treatment must be based upon an accurate consideration of the special requirements of each patient as distinguished from those of a sufferer from a similar complaint, but with a different constitution and with different recuperative powers. The one patient lends himself more readily than the other to the precise direction of the surgeon, and gained the benefit thereof. Derangement of nerve function was largely due to exhaustion and fatigue of nerve energy. City merchants overtaxed their mental powers by the hurry and rush of business, with its keen competition, and the limited periods given to recreation. Those who, like actresses, were called to lead a very active life in public under high mental pressure, exposed to public criticism in crowded, ill-ventilated theatres, with late hours, turning day into night, suffered from neurasthenia. In such cases "wearyed Nature seeks repose." The result of such over-

strain was exhaustion of physical energy and impaired assimilative functions. The overwrought brain declared itself by excessive irritability; the sufferer attempted to rectify the depression by recourse to alcoholic stimulants or narcotics. The vital powers became depressed, the appetite failed. The blood plasma became impoverished; the brain cells were poorly nourished; and there was a general break-up of the constitution. In such cases, when the disease could be arrested in its earlier stages before structural decay had set in, much might be done to restore the shattered health by recourse to the manipulative treatment and proper regulation of diet, sleep, and exercise.

TREATMENT OF DISEASE BY DIETETICS.

Dr. DUTTON said disease, taken generally, was due to some malnutrition of the cells which composed the various organs through the food being defective in quantity or quality, hence the astonishing results of treatment which often followed when nourishment was ordered which could be easily digested and assimilated. The main cause of disease, exhaustion, and debility, particularly among the poor, was bread, their staple food, being deprived of the most nourishing part of the corn. Physicians should study not only the chemical side of food, but the practical side also; they should also be well versed in all agricultural matters, and be good judges of food in its raw state, and above all they ought to possess a sound technical and practical knowledge of the culinary art, in order to be able to give sound advice to their patients on dietetic subjects.

EFFECT OF CHLOROFORM ON THE LIVER.

Dr. J. T. HEYMANS (Ghent, Belgium) showed some anatomical specimens and microscopic slides of the liver of a rabbit. They showed that in chronic poisoning by subcutaneous injection of chloroform the hepatic cells underwent a gradual change, and also the tissues immediately surrounding them, so that at length the liver presents all the appearance of true cirrhosis.⁶

TREATMENT OF TUBERCULOSIS BY PURE FORMED FERMENTS.

Dr. DE BACKER (Paris) read a paper on this subject, in course of which he stated that he had succeeded in obtaining varieties of yeasts which thrive well in the living tissues, and which, when injected into tuberculous patients, produced a remarkably beneficial effect on the local lesions and general symptoms. He attributed these effects to a phagocytic action of the living yeast cells. He exhibited an ingenious apparatus for making the injections of yeast cultures.

TABLOIDS, TABELLÉ, ETC.: THEIR USES AND ABUSES.

Dr. C. R. ILLINGWORTH read the following paper: I wish to consider what advantages tabloids of various medicaments offer to the practitioner in lieu of the long tried forms of mixture, pill and powder; and also to point out the dangers which lurk in them, first to the patient, and secondly, though importantly, to the doctor's pocket. 1. A solution is much more easily dispensed than a solid, because the former is measured whilst the latter has to be passed through the tedious process of weighing. 2. Solids have to be dissolved to make a bottle of medicine, and solution is far better effected *en masse*, as in ordinary dispensing for the making of stock solutions, than bit by bit for each bottle of medicine needed. 3. Tabloids are never made for children, who are the greatest anxiety of the physician in active practice; and the calculation of doses for them is more complicated and fractional in the case of "tabloid prescribing" than might be thought or supposed. 4. If the calculation of dosage be left to the parent or guardian or nurse, it therefore stands to reason that the door is widely opened to grave miscalculations, possibly with fatal consequences in the case of children's diseases. 5. Much remunerative practice is unavoidably thrown into the hands of chemists and charlatans, who become thus the middlemen between the manufacturer and the public for the sale of thousands of remedial agents in handy form, with full instructions on their labels, rendering, in the opinion of both, the intervention of a medical man totally unnecessary; and putting the noble science of medicine into the position of a degrading trade. 6. There is a very grave doubt as to the solubility

⁶ Cf. *Archives de Pharmacodynamie*, 1894, vol. i, and 1895, vol. ii.

in the semifluid contents of the stomach and bowels of very many of the drugs put up in tabloid form. Indeed, it is well known that many have been found by accident quite unchanged in the dejecta on the casual giving of an enema during their administration. For these reasons it is, I think, impossible that we shall ever submit to a revolution in the methods which have obtained for so many generations in the dispensing of medicines to our patients, whether effected personally or by prescription, as was recently and very forcibly averred to be imminent, in the columns of the JOURNAL. Tabloids dosed for adults only can be put with safety into the hands of adults for their own use only, and children remain an unlooked-for and yet a more important, because a more numerous, quantity in the projected change of administration; and if the difficulty be fairly met, the accompanying trouble is not compensated for by the advantages of such a form of medicament for children, whether calculated by the doctor or left to the arithmetical wisdom of the parent or guardian of the little patient. Of the great usefulness of tabloids and tabellæ in subcutaneous medication no one doubts. But that is no argument for the invasion by the said tabloid into the whole arena of the dispensary. As an instance of the extreme danger of some undissolved tabloids I may name iodide of potash. Careful instructions are, I know, given by most if not all firms regarding this drug, as to dissolving each tabloid in water; and all hypoderms are of necessity first dissolved. But there is a growing tendency I find to cultivate a rapid and easy mode of despatching tabloids by swallowing them like pills rather than a safer one of dissolving or pulverising them first. Of the insolubility of many, taken whole, I have had ample proof in my practice, and my desire in this paper is to advocate most strongly the solution of all which are soluble before administration, and the pulverising of all which are not; if so be, that is, that a course of tabloids instead of mixture has been determined upon. In this way only I feel convinced from experience will the results which are expected be secured. For instance, I had seven cases of a common disorder recently to treat. Six of these I treated in the ordinary way, and one, because he wished it, by the tabloid and tabella method. The six were cured in one-eighth part of the time, although larger doses were given by tabloid than by mixture. It will readily appear that if a form of tabloid of a more soluble nature, made not by great compression but by simple enclosure of the ingredients in some soluble capsule, could be administered, much that is objectionable might thus be removed, although other improvements might still be needed in other directions. I refer to the soluble gelatinous or glycerine jubube capsules named by some palatinoids and by others *cachets*, which latter are, I understand, so largely used on the Continent, and are superseding the compressed drugs very extensively in America. The objection of the insolubility of a tabloid, tabella, etc., being in these ways completely overcome, there remains the question of causticity of the contents, a matter of no slight importance. Manufacturers of all these specialties need only a general recommendation emanating from the Council of this department of our Association to place on their labels full directions for the prior solution in water of all those capsules containing either suspiciously or actually caustic drugs, or to dilute them so thoroughly with harmless vehicles that their causticity is rendered absolutely *nil*. And this difference in the capsules might be indicated and accentuated the more readily by a difference in the shape of the tabloid, palatinoid, *cachet*, etc., by making those which are to be first solved square or oblong, and labelled as desirable.

THE ETIOLOGY OF ACUTE PEMPHIGUS.¹

By GEORGE PERNET, M.R.C.S.ENG., L.R.C.P.LOND.

A FATAL case of acute pemphigus,² which came under my care recently, led me to look up the literature of the subject, with the view of throwing some light on a morbid condition, which has given rise to much controversy. The

¹ Read in the Section of Dermatology at the Annual Meeting of the British Medical Association held in London July-August, 1895.

² *British Journal of Dermatology*, April, 1895, p. 120.

facts of the case just alluded to were briefly as follows: A journeyman butcher, aged 31, injured his little finger in the course of his work. He paid no attention to the wound, and it remained as a small gathering for about three months. A large blister then appeared on the site of the injury. This was treated as a whitlow, and healed. Ten days after the blister formed, a bullous eruption appeared, which rapidly became general. The patient died sixteen days after the first appearance of the eruption. The case may be described as one of acute bullous eruption, accompanied by severe constitutional symptoms, occurring in a journeyman butcher, and evidently as the result of a wound.

I have been able to collect four very similar cases, all occurring in young journeyman butchers. In three the disease was fatal in from ten to twenty-eight days. In two cases, one of which recovered, there is a distinct history of a wound.

In 1856 Sir George Burrows³ published a lecture on a case of acute bullous eruption. A young butcher was admitted to St. Bartholomew's Hospital on April 8th, 1856. Five weeks before admission the patient, whilst chopping a sheep's head, cut his left thumb. The wound continued to discharge, but he remained well until April 5th, when the eruption commenced. The patient suffered severely, but recovered. He was convalescent a month after admission.

Burrows compares this case with another, which had come under his care in 1854. The patient was also a young butcher, with a precisely similar eruption. In this case, too, there was a history of a wound, inflicted whilst dressing sheep's heads. He was admitted to St. Bartholomew's in March, 1854, in a more advanced stage of the disease than the case just referred to, and died at the end of a fortnight.

Horand,⁴ of Lyons, had a case under observation in 1872. A journeyman tripe butcher, aged 17, first noticed some small bullæ on the sides of the fingers and toes on August 21st. He was admitted to the Antiquaille Hospital on August 22nd. During the night the eruption became general, and the patient died on August 30th.

Gibier⁵ refers to a case of a journeyman pork butcher, aged 17, under the care of Vidal at St. Louis. The eruption commenced on August 14th, 1881, four days before admission to hospital. The patient died on August 31st.

In the two last cases there is no mention of a previous wound. The occupation is one, however, in which wounds of the hands and fingers are frequent.

In a case referred to by Moissenet⁶, but of which no details are forthcoming, an alcoholic pork butcher is stated to have succumbed in twenty-four hours to acute pemphigus.

There is another case of acute pemphigus on record (1813), occurring in a weaver, who also slaughtered animals. The patient was seen by Henning⁷ eight days after the commencement of the eruption. Two days later the patient died.

Adding these seven cases together, including my own, no fewer than six terminated fatally, and in three there is a distinct history of preceding injury.

In a second series of cases (8), apart from butchers, but where the nature of the occupation brought the patient in contact with animals or with dead portions of animals: meat, hides, etc., the acute bullous eruption was fatal in 5 (4 females, 1 male). In 3 of the 8 cases there is a distinct history of injury to the hands, and in two others a whitlow of the finger was noticed on admission to hospital. In as few words as possible the data of these 8 cases are as follows:

CASE I.—A tanner, aged 50, under Dr. G. Newton Pitt⁸ at Guy's. Health good up to October, 1887, when the patient poisoned his left little finger; ill five weeks. Five weeks later he poisoned his left thumb; ill three weeks; then noticed small vesicles on arms, neck, and thighs. These disappeared. On December 27th, 1887, fresh vesicles appeared on the perineum, penis, and thighs. Admitted to Guy's Hospital on January 3rd, 1888. Died on January 10th. This case was very much like the one I had under observation, but was not so extensive.

³ *Medical Times and Gazette*, 1856, vol. i, p. 589.

⁴ *Ann. de Derm. et de Syph.*, vol. iv, 1ère série, p. 401, 1872.

⁵ *Ann. de Derm. et de Syph.*, 1882, p. 101.

⁶ Discussion of Horand's case, *Ann. de Derm. et de Syph.*, loc. cit.

⁷ *Journal d. prakt. Arzneykunde u. Wundarzneykunde*, 1813, vol. xxxvii, p. 89.

⁸ *Path. Trans.*, 1889, vol. xi, p. 393.