in several cases of comminuted fracture of the body of the bone, drilling the bone through the mouth or through a wound which already existed. Mr. Bickersteth of Liverpool (*Medico-Chirurgical Transactions*, vol. xlvii) has suggested and practised a method of securing the fractured ends of this and other bones by means of a drill, and has given a most interesting account of several cases in which it was successfully adopted. The employment of special external incisions, as in the case related, has rarely if ever been practised in connection with recent fractures of the lower jaw. The objection to them is the resulting external cicatrix or cicatrices which, although not of so much consequence in the male, as the whiskers will usually completely cover them, must cause some deformity in the female. For this reason, I would only advocate an external incision or incisions in cases which cannot be successfully treated by other means. In the removal of the tongue, or portions of it, and in some cases of tumour of the jaw, I always now bring the ends of the divided jaw together by means of the wire suture; and my experience of this method is, that it is safe, efficient, and easy of application. Since writing this, Mr. Mason of St. Thomas's Hospital has been kind enough to direct my attention to the ingenious method of employing the wire suture in bringing the end of bones together, practised by him (*Medico-Chirurgical Transactions*, vol. liv). His method allows the wire to be easily removed at any time, and is, therefore, to be preferred to that which has usually been employed, should the case admit of the needle being passed in an oblique direction through both ends of the bone.

ANOTHER CASE OF POISONING BY HOMŒOPATHIC SOLUTION OF CAMPHOR.

By GEORGE JOHNSON, M.D., F.R.S.,
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In a paper of mine published in the last volume of the Clinical Society's *Transactions*, there will be found notes of five cases in which symptoms more or less distressing and alarming were caused by homœopathic concentrated solution of camphor. I am indebted for the particulars of the following case to a former pupil, who gives me permission to publish them, but begs me to withhold his name, for the reason that it is a rule of the public service in which he is engaged that no medical officer shall publish his cases without special permission, which is not always granted when asked for. I give the case as reported in a letter addressed to me by the medical officer who saw the patient.

"I was called in to see a lady about thirty-five years of age, and found her with a very pale face and weak pulse. She said she had been suffering from a bad cold and feverishness; that she had got up late, and had her dinner at about two o'clock. About an hour after dinner, her sister, who is an experienced nurse, dropped seven drops of homœopathic solution of camphor on a lump of sugar, and gave it to her. Immediately after taking it, she was attacked with a very faint feeling, which compelled her to lie down flat on the hearth-rug; and she nearly lost consciousness. This lasted about five minutes. When I arrived, her face was very pale, and her pulse was weak. I ordered her to bed, and gave her some aromatic spirit of ammonia and lavender. She was very drowsy after she got to bed, but had no more vertigo or faintness; and in a day or two she got rid of her cold. I am led to believe that this was a case of camphor-poisoning similar to those which you have published, for the following reasons: the attack occurred immediately after taking a dose of camphor; the patient says that she had never before had a similar feeling of faintness; and the vertigo or faint was followed by drowsiness."

There can, I think, be no doubt that the symptoms were a direct result of the camphor. The dose was smaller than in any other case which I have met with in which poisoning has resulted from the incautious use of this dangerous compound. The homœopathic concentrated solution of camphor is a saturated solution of camphor in alcohol, the proportion being an ounce of camphor to an ounce and a quarter of spirit. Seven drops would be an uncertain quantity; but seven measured minims would contain rather more than five and a half grains of camphor. In one of the cases which I have recorded in the *Transactions* of the Clinical Society (vol. vii), a dose of twenty-five drops, taken by a young lady for a cold, caused violent convulsions and nervous sequelæ which continued for several months. In another case, eight doses of three drops each, taken by a clergyman within forty minutes, caused violent headache, sickness, and inability to work for two months. In a case communicated to the *BRITISH MEDICAL JOURNAL* by Dr. Clifford Allbutt (Dec. 6th, 1873), two doses of at the most ten drops each rendered a robust mountain-guide so giddy that he was unable to proceed on his journey, and he had to be deposited in a

cave for safety. Lastly, in two other cases, a teaspoonful dose caused convulsions and coma.

It is time that the public should be warned of the danger which they incur by the use of this poisonous homœopathic concentrated solution of camphor, which is more than seven times the strength of ordinary spirit of camphor. It is notorious that the modern disciples of Hahnemann have gone from the ludicrous extreme of infinitesimal dilution to the dangerous extreme of the greatest possible concentration of active and poisonous drugs.

ON THE RELATIONS BETWEEN DIPHTHERIA AND SCARLET FEVER.*

By ARTHUR RANSOME, M.A., M.D. Cantab.,
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THE following case shows the close connection between these two diseases.

On February 23rd last year, a boy at school had scarlet fever. He was isolated until March 25th, when his brother saw him and took the complaint. Other cases occurred at the school on the 29th, 30th, and 31st. On April 2nd, one of the masters had a rigor and sore-throat; he left at once, and was seen by me next day. On the third day, diphtheritic patches covered the tonsils; but there was no rash. Slight albuminuria accompanied the pyrexia; both disappeared by the seventh day. On April 9th, six days after he arrived at home, his mother was attacked, membranous exudation appearing in both tonsils; but there was no albuminuria, and no rash.

The origin of these cases must surely be traced to the epidemic of scarlet fever at the school; for there were no cases of diphtheria either in the neighbourhood of the school or near their home. The close relationship of these diseases has often been pointed out. In the *Report of the Medical Officer to the Privy Council* for 1859, Dr. Burdon Sanderson gives cases of diphtheria and scarlet fever coexisting; there also I find three cases of diphtheria following three of scarlet fever, and the former spreading to a neighbouring cottage. These diseases have much in common. They are alike in their zymotic or epidemic character; both are characterised by high pyrexia; their chief point of attack is the throat and the glands of the neck; and a rash is found in both diseases. Their sequelæ also are similar: suppuration in the lymphatic glands, ulceration of the ears, arthritic affections with or without cardiac complication, kidney-disease and dropsy, general or localised paralysis of the nervous system. I have seen each and all of these consequences after both diseases.

Some physicians have been led by these points of resemblance to regard them as one disease, the same poison producing different manifestations; but, in spite of their similarity, I venture to think the differences are too important and too numerous to permit so simple a solution of the problem. In the first place, diphtheria is seen to arise directly from scarlet fever. I have never known the converse action. There are other etiological differences. Though both are contagious, diphtheria is less so, and more frequently occurs in single cases. Where several cases occur together, some general cause is probably concerned. Scarlet fever is more frequently conveyed by clothes or other fomites, by attendants on the sick, and it may be conveyed by means of milk. I am not aware that diphtheria has ever spread by any of these means. The two diseases differ in their geographical distribution. Diphtheria is common in India, where scarlet fever is unknown. Colonies and all new settlements seem peculiarly liable to diphtheria; it has appeared in the Australian colonies and in South America, attacking the otherwise healthy town of Buenos Ayres. In Lima, it was noticed that the black races withstand its contagion. It selects high and well drained districts, when low-lying lands in the vicinity escape. Dr. Blake, in the *Transactions of the Medical Society of California*, mentions a most fatal epidemic at an elevation of 4,000 feet. Many places in England subject to diphtheria are either high or well drained. Scarlet fever also haunts certain places; but these scarlet-fever fields are not at high levels, nor are they those in which diphtheria is especially prevalent. Diphtheria is often connected with defects in the house-drainage, not always due to imperfection in the house-connection with a general sewage-system, but to leakage from private cesspools; so that a question of spontaneous origin may arise in this disease, which is hardly admissible with respect to scarlet fever. Season has a different influence on the two diseases; scarlet fever being most prevalent in the autumn, low barometric pressure and greater humidity in the air favouring its diffusion; while diphtheria may arise at any season, and, in my own experience, its most virulent epidemics have occurred in the summer months.

* Abstract of a paper read before the Epidemiological Society of London, January 13th, 1875.

Another difference is found in the fact that scarlet fever is not often associated with other diseases, while diphtheritic affections are not uncommon in the course of other pyrexial disorders. It is recorded in the Report of the Diphtheria Subcommittee of the Epidemiological Society, that, in the epidemic of 1861, this disease occurred fifty-seven times alone, thirty-four times in association with scarlatina, nine times with small-pox, seven with measles, six with fever, and three times each with ordinary sore-throat, croup, and catarrh. But in the nature and symptoms of the two diseases are points of unlikeness too great to allow us to rank them as varieties of the same species. Thus, the rash of diphtheria is often absent, is very variable as to the time of its appearance; it occurs seldom at the outset of the malady, and I have seen it as late as the third week of its course. The period at which albuminuria sets in is also different, often appearing in severe cases of diphtheria within the first two or three days, whilst in scarlatina it seldom sets in until degeneration of the kidney is commencing. There is, indeed, an entire absence of definiteness about the duration of the symptoms of diphtheria, which of itself marks it off from the regular sequence of events in scarlet fever. I have known it last for six weeks, and even two months, without any evident affection of the cervical glands, but with constant formation of exudation on the fauces or on other mucous surfaces.

The mode in which diphtheria localises itself on the mucous membranes, or on the broken surfaces of the skin, would probably be sufficient to separate it from any other disease. I do not know that scarlet fever ever attacks the larynx; but I have seen the diphtheritic membrane appear in different cases upon wounds of the skin, upon blistered surfaces, and upon nearly all the mucous membranes of the body—the lips, cheeks, nose, ears, pharynx, larynx, trachea, and bronchi, and on the anus and vulva; and different epidemics have differed strangely in this respect; in one, the throat would always be the point selected for attack; and in another, the other mucous membranes. It is somewhat remarkable in the latter case that, although the disease was mild and there were no deaths, the subsequent complications were much more frequent and troublesome.

The last point of difference that I shall mention is the fact that, while scarlet fever seldom reappears again in the same individual, diphtheria seems by its first attack to confer no immunity from subsequent seizures; on the contrary, the susceptibility of the throat seems to be rather increased.

Upon taking a survey of all these relations existing between scarlet fever and diphtheria, it is evident that they are distinct diseases, and yet that there is some very close and definite connection between them. Wherein the bond consists, it is not easy to point out. From the manner in which the diphtheritic poison seeks out the highest points of the best-drained localities, it has appeared to me most probable that the virus of this disease must be of a more rarefied and subtle nature than the germs that produce scarlet fever.

It is possible that the nature of some other ferments may throw some light upon this subject. I would specially call attention to the discovery by M. Berthelot (*Comptes Rendus*, vol. 1, p. 980) of an unorganised glucosic ferment in an infusion of yeast resembling diastase; also to the fact that one fermentation by organised beings frequently prepares the way for another. It may be suggested, that in one of these ways the singular relations existing between scarlatina and diphtheria might be accounted for. I do not venture to affirm that there is a strict analogy between these fermentative actions and the zymosis of scarlatina and diphtheria; but, as there exist in nature ferments requiring the presence of living germs, and others acting independently of them, so there are disease ferments with organic germs reproducing themselves, and others which have no definite term of life, and which are not self-reproductive.

It is probable that, in most cases of fermentation, the living being connected with each kind of this action is of a specific nature, and peculiar to the medium or to the food upon which it lives. In some instances, a ferment either during or at the end of its operation will produce the conditions favourable to the growth of another kind of germ, as seen in the crowd of vibrios appearing at the end of a mycoidermic fermentation; so the pyrexial state may produce the condition most congenial to the diphtheritic ferment, whether that may prove to be an organised germ or an unorganised catalytic ferment. As my excuse for offering these suggestions, I will quote, in conclusion, the words of the great English philosopher Robert Boyle. "He that thoroughly understands the nature of ferments and fermentation shall probably be much better able than he that ignores them to give a fair account of several diseases (as well fevers as others) which will perhaps be never thoroughly understood without an insight into the doctrine of fermentation." (*Works*, ed. 1744, vol. i, p. 476.)

MALARIA.

By T. INMAN, M.D.Lond.,

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As I anticipate that my friend Dr. Oldham will, in due time, make his remarks upon what has appeared on this subject in the JOURNAL, I do not intend farther to prolong the controversy, especially as I find it difficult to do so without being satirical upon the logic of those who have supported the old idea of malaria.

For example, to my mind it appears strange that an ague-fit coming on after a gravel-walk has been raked, or a pit dug, must necessarily rise from a disturbance of the earth. I can recall plenty of cases in which ditches full of vegetable debris, stagnant ponds, and soil of all sorts, have been dug out and dug over. In one, this process was marked by an attack of sciatica in the master; in another, by gout; in another, by chicken-pox; in another, by pneumonia; in another, by a drunken bout; in another, by catarrh; in another, by paralysis; in another, by chorea; and in another, by gonorrhoea. Would not every one "write me down an ass" if I associated any one of these complaints with an upturning of sods, delving ditches, taking up potatoes, storing carrots, turnips, or mangold, or with other farm-labour? Then, if an attack of ague should come on, are we to be asked to jump to the conclusion that the complaint was caused by raking a gravel-walk, or digging a grave in the nearest cemetery? Again, all the correspondents have avoided the very important point, that emanations, whether from marsh or river, trench or pit, are the most abundant and incessant during the heat of the day, a period when nobody pretends—except in such cases when the body is suddenly chilled by a hailstorm, or by wading through cold rivers, or by a cold wind from the mountains, or simply by a drying zephyr when the body is covered with thin garments soaked with perspiration, rain, etc.—that agues are caught. The well known Maremma and Pontine Marshes and the Campagna around Rome are innocuous during the day, when the sun is hot and every emanation strong.

When night falls, and emanation ceases, then comes the danger of ague, etc. Clearly, then, the cause must be sought in a something which there is in common between nights in general and those conditions that will give ague during the day. This something, most unquestionably, is not malaria, or an emanation from any soil.

I commend the inquiry to those whose experience is commensurate with their acumen. I am quite aware how easy it is to try to put down a thinker by an array of so-called facts; and I have known a "stay-at-home" astronomer convict of inaccurate observations the whole of the officers of an exploring expedition, who insisted that their chronometers went wrong for three days, under the influence of a land-breeze from Australia. The head man was not so silly as to stick up for the malari-ous effect of proximity to land, but re-examined his calculations, and discovered the error.

Some of the writers in the JOURNAL seem wholly to have misunderstood the bad effect of sleeping on the deck of a ship being dependent upon (1) hard work and exhaustion under a hot sun; (2) sleeping where the body is certain to be chilled by radiation or a cold land-wind; and they make merry over the fact that many are taken ill between decks. Unquestionably they are, when all the air-holes are kept open, and admit a chilly land-breeze. Men on board ships in the deadliest African rivers escape fevers—as far as they are caught on ship-board—by closing the windows at sundown. At sea, the air in the tropics is equable day and night, when not chilled by a cold land-breeze. In like manner, one may cross the Pontine Marshes by night, by excluding from the carriage in which one rides the bitter cold; not that which we call bitter in England, but very severe to those accustomed to a day temperature of 140 degs. in the sun and 88 to 92 degs. in the shade, and who are too lightly clad to bear a sudden fall to 60 or 50 degs. during the hours of darkness. No amount of experience in the field can alter the physical fact that in many places in hot climates the nights are colder than the days, especially when the sky is clear. Even frost occurs occasionally by night on the Sahara; and the Arab always keeps his most valued horses under cover after sundown, and in good stables too.

Nor can any amount of experience, from the Indus to the Pole, convince us that very formidable diseases—*e. g.*, pneumonia and bronchitis—are not frequently produced by a severe chill after fatigue and exposure to heat. I should pay no compliment to the writers if I were to count *seriatim* all those complaints—even including purulent periostitis and necrosis—which have fairly been traced to violent chill after exposure to heat, without a microscope being able to detect in the air or water