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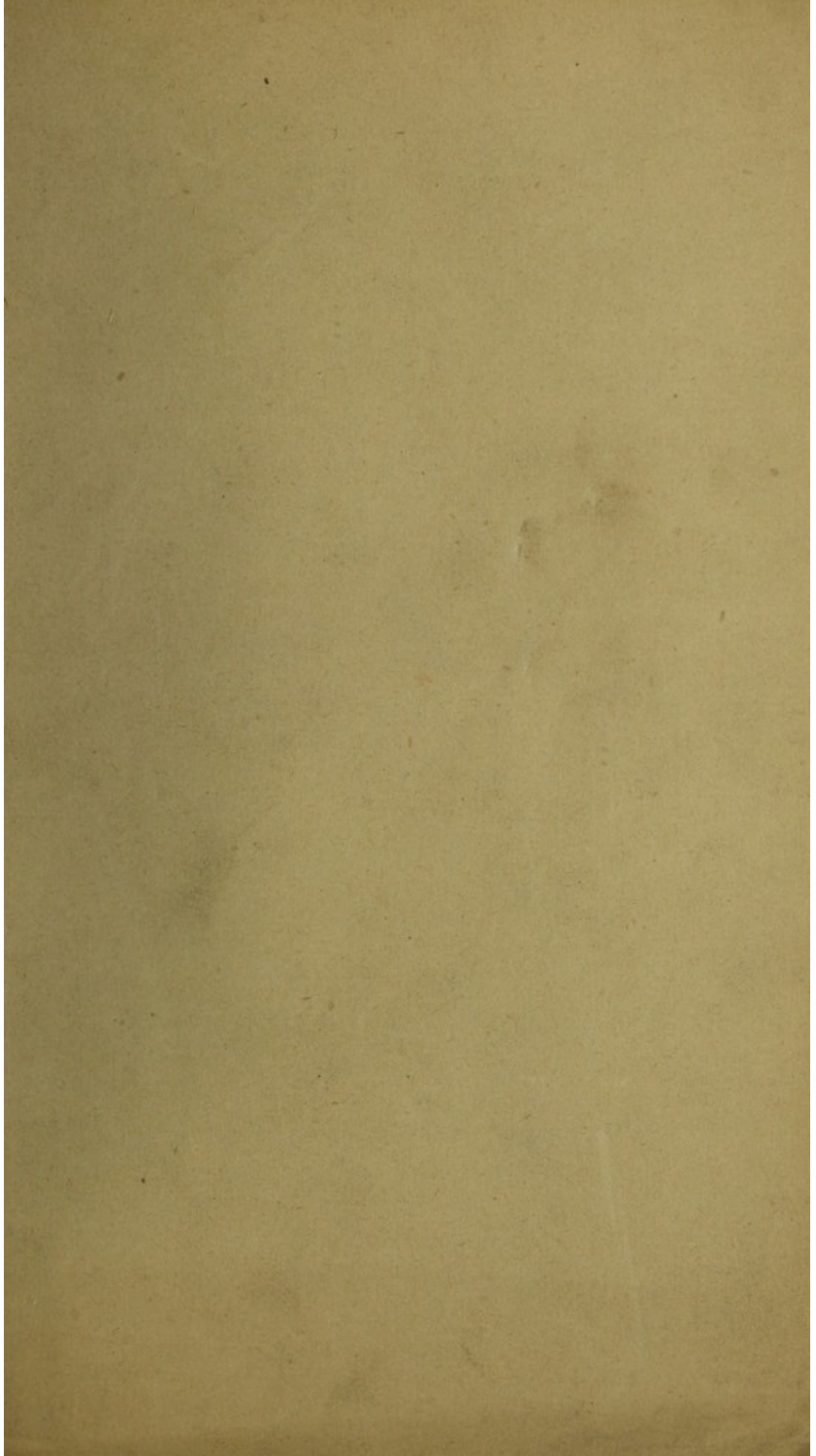
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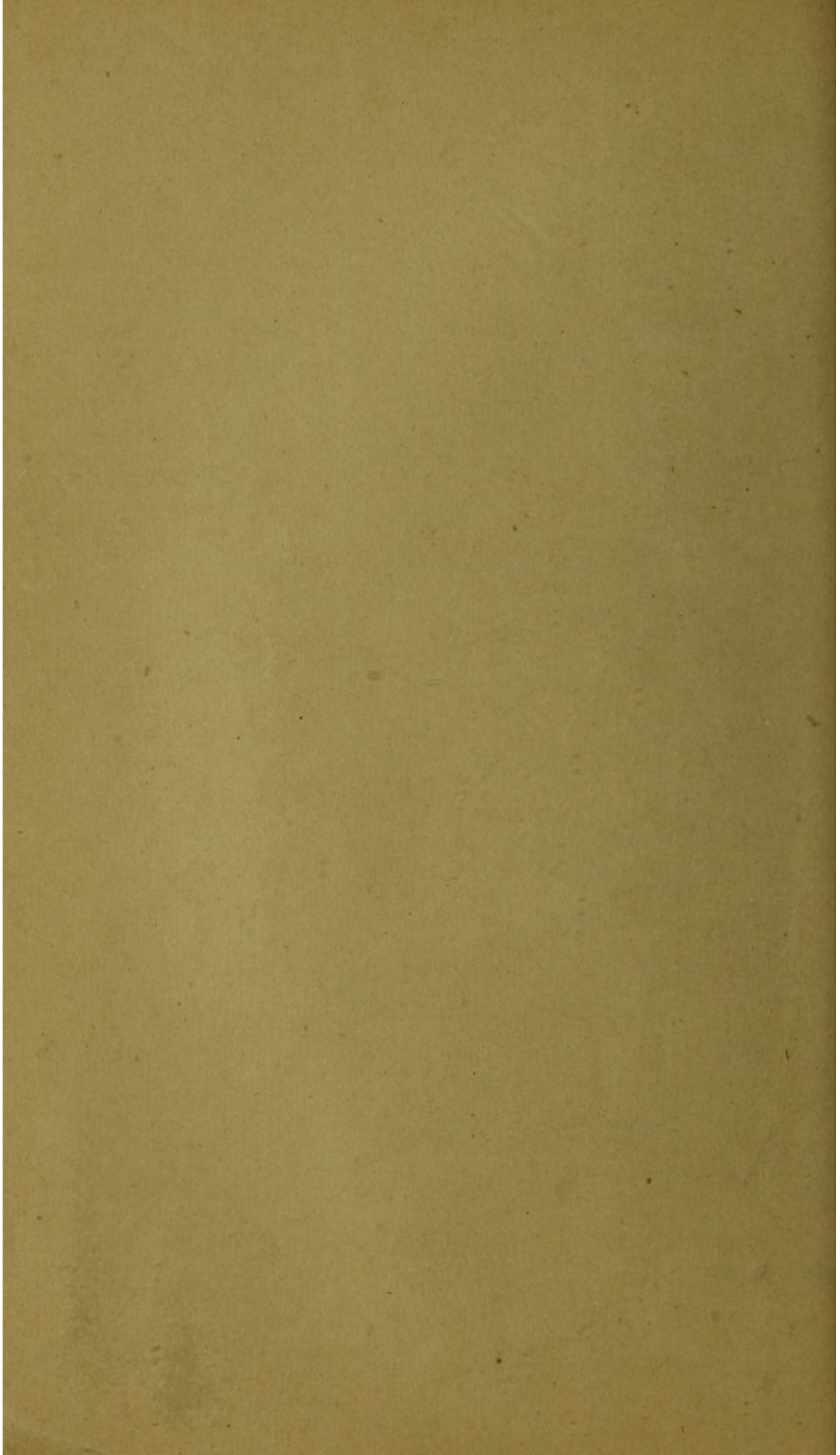
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A CASE
OF
MENINGO-CEREBRITIS,
CAUSED PROBABLY BY EXPOSURE
TO THE SUN.

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CASE OF MENINGO-CEREBRITIS.

PERHAPS the following case may not be uninteresting to the profession, considered with reference to the almost tropical weather that prevailed in Great Britain during the month of July last.

On Saturday the 11th of July, about mid-day, John Hardie, aged 22, a shepherd, was employed gathering sheep from the hillside. The day was oppressively warm. Feeling fatigued, he lay down and fell asleep, fully exposed to the sun. He slept not more than twenty minutes. On awakening, he found his bonnet had fallen off his head while asleep, and he had a severe bursting headache. He was able to finish his day's work; and in the evening, after sunset, he bathed in a Highland stream, in the hope of relieving the headache. He remained in the water about half an hour. While dressing he had a rigor. He went home to bed, and had a second rigor more severe than the first. Passed a restless night. Headache worse on Sunday morning. Sick during the day, and repeatedly vomited. Gradually became worse on Monday and Tuesday, and on Wednesday morning (the 15th), he was brought to the Belford Hospital.

When admitted, he had the appearance of one about to suffer from a smart attack of typhus. Intelligence blunted, slowness of perception, vagueness and stupidity in answering questions; staggering gait, conjunctivæ deeply injected, forehead hot, temporal arteries violently throbbing; complaining much of headache, chiefly over the left frontal eminence, vertigo, back-ache, and a feeling of general illness; pupils contracted, slight photophobia; respiration normal; pulse 113; tongue white in centre, with red margins and prominent papillæ; bowels not moved for three days; skin hot, dry; temperature in axilla (Aitken's clinical thermometer) 100·2°; urine alkaline and depositing earthy phosphates. He was put to bed, the head shaven, and three leeches applied to left temple. Got three grains of calomel, and was ordered a wineglassful of the following mixture every three hours:—℞ Magnes. sulph. ℥i ss., liq. ammon. acet. ℥ij., vin. antim. ℥ij., aquæ ℥xx. m. Iced water cloths to the head. Milk diet. Began to talk incoherently soon after being put to bed.

16th July.—Passed a restless night; violent delirium; skin over the malar bones the colour of scarlet; conjunctivæ deeply injected; bowels freely moved and evacuations healthy; tongue rather dry and beginning to be brown in centre; pulse 100, full and regular; temperature, 99°. Ordered cold-water douche to vertex to moderate delirium; ℥ij. of acetate of potash added to the mixture to act as diuretic. Milk and arrowroot diet.

17th July.—Continuous delirium; pupils rather dilated; pulse 87, labouring; temp. 99.2°; bowels moved and urine passed in bed. Towards evening became very drowsy, with low muttering delirium. Turpentine stupes were applied to legs, and a blister applied to nape of neck.

18th July.—Passed a quiet night, but in the morning there was a return of pyrexia. Delirium very violent and destructive; pulse full, strong, 110; temperature 99.8°. Bowels were so freely moved that the mixture was stopped. Cold douche to head. Iced water cloths continuously applied to scalp. Taking a good deal of arrowroot and beef-tea.

19th July.—Very much as he was yesterday, but delirium more moderate.

20th July.—Towards evening symptoms of compression began to show themselves. Pupils widely dilated; breathing stertorous; pulse 70, small and wiry; temp. 99.9°. Applied a blister to the scalp, and ordered eight grains of iodide of potassium every four hours. Ample supply of strong beef-tea. Half ounce of port wine every hour and a half. The blister soon roused him; and, late in the night, he became more intelligent than he had been for several days. Appeared to recognise his father. Slight subsultus.

21st July.—This morning eyeballs were very prominent and staring, but no strabismus; conjunctivæ clear; speech very thick and difficult to understand; sleeps much, and when awakened appears to be frightened; pulse 78, small, wiry; temp. 99.1°. Added 15 minims of aromatic spirit of ammonia to each dose of the iodide of potassium. Nutriment and stimulants (port) to be given frequently, according to the state of the pulse.

22d July.—Increased somnolency; articulation more indistinct—sounds like ba, ba, bap, bap! Same treatment continued. Small blister to nape of neck. Bowels moving freely, and evacuations healthy-looking.

23d July.—At 3.30 A.M. there were symptoms of collapse; feeble, rapid, intermittent pulse; pinched expression of face; cold extremities. Revived, after 20 minims of spirit of chloroform and 28 minims of aromatic spirit of ammonia had been given. A tablespoonful of brandy mixture given occasionally. Iodide of potassium treatment continued. Patient improved during the day. Pupils much dilated, but still responding to light.

24th July.—Evidently sinking; pulse 130, thready; temp. 102.3°; left eyeball more prominent than right, and conjunctiva deeply

injected; moaning piteously. Stimulants were freely given—brandy, ammonia, and ether; but he gradually sank, became quite comatose, sphincters lost their power, pulse became more rapid and more thready, respiration shallower; obiit 7.55 P.M.

A post-mortem examination was made on the 27th of July, at 4 A.M., 56 hours after death. Calvaria easily removed; dura mater healthy, but stretched tightly over the convolutions; arachnoid of a pinkish colour throughout, and presenting at several places pearly-looking spots about the size of a sixpence-piece; very little serum in the sac of the arachnoid; veins of pia mater fuller than usual and somewhat tortuous, especially in the occipital region; pia mater easily detached from cerebral substance. On making an incision into the convolutions, numerous red spots observed in both gray and white substances. The whole of the posterior half of the left hemisphere was soft and infiltrated with purulent-looking matter, and the left lateral ventricle was full of it. The right hemisphere was not so much congested as the left; there was no pus or broken-down substance; but the right ventricle contained dark-looking serum. There was no abscess with definite walls. A microscopical examination of the purulent-looking matter showed a few characteristic pus cells, lying amongst granular matter, probably broken-down nervous tissue. Base of cerebrum apparently healthy. Nothing unusual about the cerebellum. An examination of the other cavities of the body was not permitted.

Remarks.—There is very little doubt that the inflammation of the brain and its membranes, which caused this young man's death, arose from imprudent exposure of the uncovered head to the direct action of the sun's rays during one of the very warm days we experienced in this country during the month of July last.

I cannot state the exact temperature in the sun at the spot where this young man lay down to rest; but the meteorological observations taken by me on the 11th of July at the Belford Hospital, Fort-William, about six miles from the hillside where Hardie slept, show that on that day the temperature in the shade was 71.7°, and in the sun 104°.

It is interesting to inquire, "Why was simple sunstroke not the consequence?" During the second and third weeks of July, many cases of simple insolation happened in Great Britain, and the records of these cases in the medical and daily papers show that in most of them the sufferers were walking, running, or driving rapidly. It would be interesting to know how they were clothed, for it seems that men may bear a very high temperature in the open air with impunity, provided the dress is adapted to the temperature, and they are not called upon to undergo extraordinary fatigue. Dr Maclean remarks, in his article upon Sunstroke in "Reynold's System of Medicine" (vol. ii. p. 157), that "British sportsmen in India often pursue their exciting amusement in the hottest weather;

but as they are careful to dress suitably, they seldom suffer from insolation."

Some cases of sunstroke are rapidly fatal—the patient falls, gasps, and in a few minutes there is death by syncope. The chief morbid appearances are congestion of the lungs and distention of the right auricle and ventricle. There is no time for cerebral congestion. But, in other cases, the effect of the overheated blood is more strictly limited to the cerebral circulation, and congestion occurs in the brain and membranes. These cases are not so rapidly fatal as those first mentioned—indeed, the patient may partially or entirely recover.

The case of John Hardie appears to me to be different from either of these varieties of sunstroke. It is, properly speaking, a case of inflammation of the brain and its membranes brought on by exposure to the sun's rays. It resembles insolation in its cause, but it differs in its effects. The phenomenon of inflammation is never observed, so far as I am aware, in cases of pure insolation; in this case, inflammation was the most prominent characteristic. In insolation, death takes the form of syncope in the rapid cases, and coma, or syncope and coma combined, in the protracted cases. In Hardie's case, death resulted from inflammatory changes in, and destruction of, so important a part of the body as the brain.

The effect of the direct rays of the sun upon the skin of the head and neck, is a subject still requiring investigation. How much of the heat is absorbed? The amount of this will, of course, very much depend upon the dry or moist state of the skin at the time. Does the heat act directly upon the bloodvessels, diminishing the contractility and tonicity of the arterial coats, and thus increasing the supply of blood to the part? If it does, how is it that the vessels do not return to their natural calibre when the relaxing influence is removed? Why is the congestion permanent? It is more probable, I think, that the superheated blood and tissues derange the nervous currents ever rushing to and fro in the great nervous centres, and that the dilatation of the bloodvessels, and consequent congestion, is a result of the perverted nervous action. Dr Parkes states in his great work upon Hygiene (p. 431), that, "from Kühne's experiments," it appears "that the heat of the blood of the vertebrata must not exceed 113° Fahr., for at that temperature one of the albuminous bodies in muscles coagulates." It is quite possible that heat may have a somewhat analagous effect upon the protein compound forming the axis cylinder of nerve-tissue, and contained also in the nerve-cells. Boiling water shrivels up this protein substance, which, in a normal condition of the tissue, is in a semi-coagulated state.

Cerebral congestion is but too often the first stage of cerebral inflammation. Nutrition is disturbed, inflammatory products are exuded, and the disease proceeds to a fatal termination.

I shall now briefly refer to a matter very interesting physiologi-

cally and pathologically, namely, the interference with speech, observed first on the eleventh day of Hardie's illness, and four days before his death. This phenomenon—aphasia, as it is termed by M. Trousseau—is to be observed in a great many cerebral diseases; but, as it promises to be a point of importance in diagnosis, it has not yet received the attention it deserves. M. Broca has come to the conclusion, that the seat of the faculty of articulate language is in the second and third frontal convolutions of the *left anterior lobe* of the brain. The case I now report favours this conclusion so far, that the pathological changes were chiefly in the *left* hemisphere, but they were confined to the *posterior* lobe of the left hemisphere. The posterior lobe of the left hemisphere was infiltrated with and broken down by purulent-looking matter; but the anterior lobe was firm and healthy-looking, with the exception of the small red spots to be seen on making an incision into the cerebral substance, indicating a congested state of the vessels. This congestion might cause aphasia; but as it may be reasonably presumed that congestion was the state of matters from the beginning of the illness, and aphasia came on only on the eleventh day, I am inclined to infer that the time of the appearance of aphasia coincided with the time when serious pathological changes took place in the *posterior lobe of the left hemisphere*. Aphasia became more and more marked during the last three days of Hardie's life, until he could utter no intelligible sound, although it was obvious that ideas of some kind were passing through his mind when disturbed.

Sir James Y. Simpson, Bart., in the eloquent medical graduation address he recently delivered, remarks that "the practice of medicine is essentially and ultimately the practical application of therapeutic agents." It is well for every practitioner to ask himself after he has seen the end, for better or worse, of an acute disease: "What did I do for my patient?"

The treatment pursued in Hardie's case was: *1st*, Trying to relieve cerebral congestion by slight topical bleeding, by a saline and diaphoretic mixture, and by the application of cold to the bare scalp; *2d*, Trying to moderate delirium by the cold-water douche,—an application I found very efficacious for the purpose intended; *3d*, Trying to encourage absorption by blister and iodide of potassium (combined with ammonia as a stimulant), when symptoms of compression set in; and, *4th*, Trying to support the patient, at first by nutrients, and latterly by nutrients and stimulants combined.

Dr Tanner, in his work on Practice of Medicine, says (p. 245),—"With regard to medicines for directly modifying the morbid action (in encephalitis), I know only of one on which the least reliance can be placed, and that is iodide of potassium. I have seen this agent, in doses of three to eight grains repeated every four or six hours, do so much good in a few apparently hopeless cases, that I think it ought always to be tried. I have, of course, found it fail; but in my hands it has never done mischief." Other distinguished physi-

cians are disposed to place great faith in iodide of potassium in cerebral inflammations. It is difficult to see how it can act beneficially in these cases. Iodide of potassium powerfully influences the absorbent system, and thus removes products of the inflammatory process. But the nervous centres themselves are destitute of lymphatics, unless the lacunar spaces filled with nuclei, observed by Robin, represent them; and Kölliker¹ says (p. 240),—"Fohmann and Arnold assume the existence of lymphatic vessels in the pia mater of the surface of the cerebrum and cerebellum, as also in the *plexus choroidei*; but it is doubtful whether they occur here." The action of iodine or iodide of potassium, like the action of most other medicines, particularly alteratives, requires to be investigated. I cannot say it did any good in Hardie's case.

¹ Manual of Human Microscopic Anatomy. London, 1860.

