statistical investigation. But it is interesting to note that some cases respond well to ultra-violet irradiation when applied to the normal white skin, to the mucous membrane, or to the blood, but other cases of similar clinical types fail to improve.

Although these irregular results cause perplexity the method of treatment should be encouraged in the hope that it may be successful.—I am, etc.,

London, W., Jan. 6th. ALBERT EIDINOW.

Monkey Malaria for G.P.I.

SIR,—In the interesting article by Dr. C. E. van Rooyen and Dr. G. R. Pile, in the *British Medical Journal* of October 12th, 1935 (p. 662), on the treatment of general paralysis by ape malaria, it is stated that among the advantages of this method over the usual treatment by the *Plasmodium vivax* (human benign tertian malaria) are:

1. That the *Plasmodium knowlesi* does not suffer progressive attenuation in virulence as compared with *P. vivax*.
2. That 7½ grains of quinine dihydrochloride given intramuscularly will cure a patient of a massive infection.

In Australia, at least, these alleged advantages are non-existent, as proved by our experience at the Callan Park Mental Hospital, Sydney. At this hospital a patient was infected artificially with *Plasmodium vivax* on April 10th, 1926, and this strain has been transmitted through 135 series of human hosts by artificial induction, not only without any attenuation of virulence, but rather with an increase in infectivity and action, shown by the fact that the patients last infected showed a rise of temperature higher than during the first cases, rising in fact to over 106° F. and producing, if anything, greater clinical improvement. Its therapeutic action is also unimpaired, as the same percentage of patients sent back to work, or otherwise improved, is still maintained after nine years of artificial induction. It has also been found experimentally that one oral dose of 5 grains of quinine sulphate will completely and permanently cure some of our cases of the infection, indicating that it is more easily cured than the ape malaria quoted by the Rosslynlee investigators.—I am, etc.,

CLIFFORD HENRY, M.B., M.S.
Deputy Medical Superintendent.

Mental Hospital, Rozelle, N.S.W., Nov. 21st, 1935.

Use of Ephedrine-Glucose-Gum Solution

SIR,—Some six months ago I suggested a routine for the treatment of the post-haemorrhagic state (*Journ. Obstet. and Gynaecol. British Empire*, 1935, xlii, No. 5, 852), which included the intravenous infusion of ephedrine-glucose-gum solution for the severe cases. I continue to receive letters asking why I favour this treatment in preference to blood transfusion, which gives such satisfactory results. The following extract from a contribution read before the Newcastle and Northern Counties Medical Society in November, 1935, gives my reasons.

"I should like to make my attitude upon this point quite clear. I approve of, and practise, blood transfusion when definite indications are present, but, as a preliminary life-saving measure in the severe cases, I carry out an intravenous infusion of ephedrine-glucose-gum solution, whether or not a blood transfusion is to be carried out later. About three hours will elapse before a suitable blood donor can be obtained and the preliminaries for a blood transfusion can be carried out, while in hospital the ephedrine-glucose-gum infusion can be commenced within five minutes of making the decision that this treatment is necessary."

—I am, etc.,

Newcastle-upon-Tyne, Jan. 13th. WILLIAM HUNTER, M.D.

Fire-walking

SIR,—The joint article by Professor Waterston and myself upon Fijian fire-walking, although not published until December 28th, 1935, was written by us on board ship early in September, within a few days of our joint observations at Fiji on August 29th. Thus, when our MS. was sent to you for publication on our return to England in November, we were unaware that similar and more elaborate fire-walking observations (reported in the *British Medical Journal* on September 28th, 1935, p. 588) had been carried out on a Kashmiri Indian, Kuda Bux, by Mr. Harry Price, honorary secretary of the University of London Council for Psychical Investigation, first in collaboration with Professor J. A. Gunn of Oxford and the late Dr. W. Collier, together with two physicists, Messrs. C. R. Darling and T. E. Banks, and also at a second demonstration a week later, in conjunction with Professor C. A. Pannett of St. Mary's Hospital, again in association with Mr. Darling. The genuine character of the fire-walking is unimpeachable. The Indian performer on repeated occasions walked with bare feet during periods of over four seconds, taking four successive paces within that time, on a surface of red-hot embers and glowing charcoal at a measured surface temperature of 800° F., so that a piece of ordinary writing paper dropped upon it ignited at once. The performer's feet were examined and found to be cool, both before and after the fire-walking. No erythema or blistering occurred, whilst a 5/8-in. square of sticking plaster attached by Professor Pannett to the sole of one foot was not scorched. On the other hand, the feet of two control European volunteers, Mr. Digby Moynagh and Mr. Maurice Cheepen, each of whom took two paces in the burning embers, were severely blistered and required medical attention.

These independent observations strongly corroborate my own view that the phenomena are induced by the influence of suggestion in an atmosphere of emotion and religious exaltation.

Within the last few days a non-medical observer, Mr. C. F. Harrison of Watford, has written to me informing me that about the year 1908–9, at the time of the New Zealand Exhibition, when he himself was a schoolboy, one of his schoolmates in Wanganui, named Sukuna, was a Fijian chief or Ratu. Mr. Harrison writes as follows:

"A party of fire-walkers came over to New Zealand to give a demonstration. Sukuna visited the exhibition and was told by the fire-walkers that as a 'Ratu' or prince he had the power to walk as well as they. Sukuna was always a sportsman, so he took off his boots and stockings and walked the stones. He could not account for it; said the stones felt intensely hot, but did not burn. At that time his feet would be just the same as those of any other schoolboy. Incidentally, the fire-walkers brought their own stones over with them."

Miss Rosita Forbes, the distinguished explorer, in her recent book *Women Called Wild* (Grayson and Grayson, London, 1935), gives a vivid description of similar fire-dancing in the jungle tribes of Dutch Guiana. The celebrations usually occur at the full moon.

The Surinam Indians, a tribe of mixed negro and Indian origin, occasionally collect groups of individuals, men and women, who, after preliminary intensive drum-beating, chanting, and dancing, so as to induce the required degree of excitement and ecstasy, carry out fire-dancing. During the ceremony the performers not only walk and dance in the flames of blazing wood, but also scoop up red-hot embers with their hands, thrusting them into the axillae and between the thighs, pouring them over their head and hair, and even taking them into the mouth. At their leader's word of command they suddenly cease. Miss Rosita Forbes scrupulously examined several of the performers immediately after-

wards. Their skin showed no sign of burning, nor was there any smell of singeing.

This South American fire-dance is undoubtedly a form of religious ecstasy. The religious ceremony is presided over by a fire priestess, specially selected and trained, who stands in the middle of the fire but does not herself dance. The orgy, as described by Miss Rosita Forbes, displays obscene sexual characteristics, details of which she duly recounts:

"Where a blaze sank, men and women flung themselves on their faces in the attitude of those drinking from a stream. Embers dripped from their mouths. They pressed burning matter into their nostrils and ears. Maddened by their own immunity, they sought to destroy it, crunching the burning wood in their teeth and forcing white-hot cinders between their buttocks. . . . The women, who had been chanting in the shadows, now kneeled among the embers, scooping up ash and smearing it on the points of their breasts. Their heads were doubled backwards, their stomachs jerked. With cries and long-drawn gasps they reproduced at once the supreme culmination of ecstasy and the death-rattle."

All the foregoing observations indicate that painless fire-walking is not a matter of habitual exercise or daily training by the performers, but a specially prepared ceremony reserved for unusual occasions, whereby complete, though transient, insensitiveness to painful stimuli, thermic and otherwise, is induced.

Dr. A. G. Thompson, in his interesting letter published in your issue of January 11th (p. 86), raises an important question which I personally am unable to solve—namely, the nature of the psycho-physical process whereby painful thermic and other stimuli are tolerated, not only with indifference to pain on the part of the performer, but also without evoking the ordinary tissue reactions, such as local erythema, necrosis, or blistering. He also recalls the well-established fact noted by other competent observers (myself included, if I may venture to do so) that not only red-hot stimulation, but also painless and bloodless transfixion of the limbs, cheeks, etc., can be carried out, under conditions of auto-suggestion or hetero-suggestion, in surroundings of religious emotional ecstasy. In one group of Mohammedan dancing dervishes in Tunisia some years ago, who exhibited in my presence the phenomena of bloodless transfixion, I observed that immediately after each man's performance the chief priest or head dervish of the party quickly drew the excited performer to one side and, embracing him round the neck, whispered for several minutes fervently into his ear a communication apparently of a calming or comforting nature. I had no opportunity of examining the skin after these transfixions, but I am confident that no bleeding occurred.

Dr. Thompson asks whether we had any conversation with the Fijian performers. Unfortunately, neither Professor Waterston nor myself spoke or understood the Fijian language, so that conversation was impossible in the few minutes at our disposal. All that we could elicit, through an interpreter, was that some sort of preliminary religious ceremony took place in the reed-covered hut immediately before the fiery ordeal.

I have not yet personally witnessed the phenomena of "Yoga" ecstasy to which Dr. Thompson refers, although I have read descriptions of it. The insensitiveness during the Yoga ecstasy, however, as described by various European observers, appears strictly comparable to the above-mentioned phenomena. In the meantime I am in entire agreement with Dr. Thompson that one's duty is to keep an open mind, not only as to the observed clinical facts, but also as to the mechanism of their production. The influence of emotional stimuli upon other tissues besides the brain can hardly be doubted. After all, an emotion is not a mere psychical reaction, but a perception of our involuntary visceral and other reactions to particular events or situations. Many bodily emotional reactions can be verified objectively, so that an outside observer may be able to recognize by clinical observation (of the heart-beat, the colour, temperature, and sudomotor activities of the skin, the salivary and lachrymal reflexes, the size of the pupils, the tonus and tremor of skeletal muscles, the intestinal and vesical reflexes, etc.) whether a given individual is experiencing emotions such as fear, surprise, or anger. Mild degrees of insensitiveness to painful stimuli during emotional excitement are familiar to everyone, and it is but a logical step to the more profound degrees of analgesia as above described, accompanied by abnormal tissue reactions. It is perhaps noteworthy that these marked degrees seem to be attained more easily and with greater intensity in African, Asian, or Polynesian individuals than in those of European stock.—I am, etc.,

London, S.W.1, Jan. 13th. J. PURVES-STEWART.

Voluntary Euthanasia

SIR,—Dr. Killick Millard is to be congratulated on the formation of the Voluntary Euthanasia Legalization Society and the prospect of achieving his aim to relieve suffering. Yet there is one proposal, as set out in the *British Medical Journal* (November 2nd, 1935, p. 856), which appears unwise—that is, that the medical attendant should kill the sufferer.

To this I am strongly opposed. I have said elsewhere, Australasian Medical Congress (B.M.A.), Hobart, January, 1934 (*Transactions*, p. 162):

"If the magistrate be quite satisfied his permission should be granted to the patient himself, or to a kinsman agreeable to undertake the sad duty, or, in the last event, to a State official. In no circumstances should a medical practitioner be required or invited to perform the office. Whenever any such suggestion is made to a medical man he should reply that it is his duty to preserve life, not to take it. Any slightest lapse from this strict attitude would tend to undermine the confidence with which at least the majority of members of the public place themselves in the hands of their doctors, knowing that they may rely on them to save and not to destroy."

—I am, etc.,

Sydney, N.S.W., Dec. 11th, 1935. GUY GRIFFITHS, M.D.

SIR,—The report of the inaugural meeting of the Voluntary Euthanasia Legalization Society as it appears in your issue of December 14th, 1935, calls for very serious comment. Apart from the moral aspect of the case, which is the most important aspect, there are many other considerations. What is an "incurable disease"? By what standards can doctors decide when a disease is incurable? Doctors frequently differ. That is a matter of hard fact. Some diseases that were incurable fifty or a hundred years ago are now curable. What might be regarded as incurable now may well be curable fifty or a hundred years hence—even five years hence. Who will limit the progress of the noble science of healing that ours is, and where will the inevitable officials and experts draw the line between "curable" and "incurable"?

According to your report, Lord Moynihan accused Dr. Hawthorne of making the "unworthy" point that doctors were capable of making mistakes. That, Sir, is a most worthy point. One of the greatest services we can pay to our profession is to realize that we can make mistakes. At present the doctor is regarded as a healer,