

LETTERS TO THE EDITOR.

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New Use for Eucalyptus.

THE following extract from a private letter deserves a wider publicity:—

W. T. THISELTON-DYER.

You may perhaps remember the work published in 1902 from this institution on "Eucalypts and their Essential Oils." Prior to this the eucalyptus oil industry was in a chaotic state in Australia, the New South Wales article being almost unmarketable. By working out the species on a basis as laid down in the work (*supra*)—that is, a natural one—many new products were discovered, such as geraniol, the active principle in the otto of roses; a dextro- and a lævo-turpentine corresponding to the American and French respectively; many eucalyptol oils (medicinal), in addition to those previously known; citral, from which ionone, the artificial perfume of violets, is made; citronellal, corresponding with the product obtained from the lemon grass of India; eudesmin and other products of unknown economic value at present.

The British pharmacopœia laid it down that no eucalyptus oil should be sold unless it contained not less than 50 per cent. eucalyptol, but such did not hold good for Australia; consequently any oils were sold for therapeutic purposes.

But recently, through our instrumentality, the Health Board has passed a regulation that the B.P. standard should obtain here; consequently there has been a "slump" in the oils thus disqualified, and so these became worthless. Naturally the distillers were very much put out with us, and some travelled so far as Victoria and Queensland to interview us and discuss the matter. But the hands of the clock could not be put back.

The now discarded oils have been classified by the chemist as phellandrene oils, and the particular gum trees yield them in larger quantity than any other oils, and the desideratum was to find an industrial avenue for their utilisation. Well, this is how it has come about. There are at certain large mining centres here millions of tons of "tailings," containing particles of minerals very finely divided, and the trouble in the past has been to extract these profitably, and many methods and patents have been adopted, but none satisfactorily.

At Broken Hill, our greatest mining centre, chemical investigation has been carried on for some time, and a complete series of essential oils of our own extraction and true to botanical names was forwarded for trial. The result was that the phellandrene oils yielded from 86 to 90 per cent. concentrates, the highest of any oil experimented with! Here indeed was a market. The demand for these particular oils has at once enormously increased; hundreds of tons are required, for the method will be introduced into U.S.A., Canada, Queensland, and through all Australia, South Africa, and wherever the industry obtains.

Its utilisation is the essence of cheapness, and the information on a sample that I brought from Broken Hill myself reads as follows:—Zinc concentrates; about Zn 47 per cent., Pb 10 per cent., Ag 15 oz.; recovered by eucalyptus oil $\frac{1}{2}$ lb. per ton of concentrates.

When we started out on our research on eucalypts we little thought that the oil would play so important a part in mining.

RICH. T. BAKER.

Technological Museum, Sydney, April 7.

The Date of the Discovery of the Capillaries.

THE discovery of the capillary blood-vessels being an event of such supreme importance in biology, it is highly desirable that the date of it should be accurately ascertained. It so happens that it is known for certain it was

made in the year 1660 by Marcello Malpighi in the city of Bologna, and yet nearly every author gives the date of this discovery as 1661.

The latest statement of 1661 is in Prof. Miall's delightful little book "The History of Biology," in which in the useful chronological table we find:—

"1661. Passage of blood through capillaries observed by Malpighi." As justifying this date, he would doubtless point to the note at the head of the table:—"The date of a discovery is the date of its first publication when that is known."

Now while in many cases this principle may be not only a convenient one, but the only one capable of application, yet in certain cases it is a principle not to be followed at all.

These cases are those in which we have evidence regarding both the date of a discovery and the date of its being made known.

For instance, the date of the *discovery* of the circulation of the blood by William Harvey is certainly earlier than 1628, the date of its publication.

We have the evidence of Harvey's own lecture notes, dated 1616, that he knew of the circulation and was teaching it at least twelve years before he published it. Only when we cannot find the true date of a discovery should we fall back on the date of its publication.

Now the discovery of the existence of the invisible capillaries was a very great thing, and it seems a pity that we should get into the habit of assigning it to one year later than it actually was made.

Sir Michael Foster's account in his "Lectures on the History of Physiology" is clearness itself. Speaking of Malpighi, we read:—"Here" (Bologna) "he resumed office as a Professor of Medicine, and in spite of domestic troubles and anxieties, pursued his researches to such good effect that he was able in the next year, 1660, to announce privately to Borelli his discovery of the structure of the lung, an account of which was published in the year following."

The published account alluded to is his "De pulmonibus observationes anatomicæ," which, after the manner of the time, is in the form of two letters to his friend G. A. Borelli, at Pisa.

In the second epistle he describes the circulation in the herniated lung of the living frog. He heads the description with these words, "Magnum certum opus oculis video"—"I see with my eyes a great, certain thing," not, as always translated, "a certain great thing," which is much feebler and not a true translation.

1660, then, and *not* 1661, was the date of the discovery of the blood-capillaries, within only three years of the death of Harvey in 1657. Harvey made their existence a logical necessity; Malpighi made it a histological certainty. As we still speak of the "rete mirabile Malpighii"—for no lapse of time can ever make that rete less wonderful—we might as well take the trouble to assign the discovery of it to its correct date, 1660.

D. FRASER HARRIS.

The University, Birmingham, June 19.

The Osmotic Pressure of Colloidal Salts.

CONGO red and similar salts in aqueous solution cannot diffuse through an ordinary dialysing membrane. When the osmotic pressure is directly measured by an osmometer it is found to be about that which the kinetic theory would ascribe to the salt present if the molecules were completely un-ionised.

The solutions, on the other hand, are good conductors of electricity, and the specific molecular conductivity of the solutions employed is that of a solute 60 to 70 per cent. of the molecules of which are dissociated. There is thus, as Bayliss has pointed out,¹ an apparent conflict between the results obtained by different experimental methods.

Congo red is the sodium salt of a complex organic acid. Its ions, therefore, are of very unequal size, and as the membranes employed in the osmometer are permeable to

¹ Paper read at the meeting of the Biochemical Society, May 4.