can ascertain no such comparison was instituted, and so, for nearly half a century, a practice prevailed which must have been constantly taking away the last chances of human life, while a truly saving practice,—artificial respiration,—remained without an improvement from the time of John Hunter, in last century, to that of Marshall Hall, who, in our own days, gave it new and prominent importance.

A dozen painless and carefully-conducted experiments made on inferior animals which were exposed at any moment to be knocked on the head for food, to be killed or mortally maimed with shot, or to be hunted to death in the field or warren, would have taught, in 1803, that the passage of a galvanic current through the muscles of a body recently dead confers on those muscles no new energy; that the current in its passage only excites temporary contraction; that the force of contraction resident in the muscles themselves is but educed by the excitation, and that to strike the life out of the muscles by the galvanic shock without feeding the force, expended by contraction, from the centre of the body is a fatal principle of practice. The experiments unfortunately were not performed, and the error, therefore, fatal as it was, continued without question, until my own unexpected observations revealed it in the light of an error and made it so self-evident that the illustration through which it may best be explained, admitted of being treated, by one who was wise after the event, as a subject for jest.

"Vidi ego, naufragium qui riserat, æquore mergi."

I will not copy the comment of the poet: far more congenial to me were it to save the endangered life.

It is from experiences such as I have given above, and in many instances, that the necessity for experimentation on the lower animals forces itself on the minds of the members of the medical profession, and especially on the minds of those who are most earnest to remove fatal errors of practice and to devise saving methods. If it were only kept steadily in view that we medical men are always dealing with fatal accidents and fatal diseases; if it were only kept steadily in view that we are always asking ourselves—Is this we are doing for the best? Or, as new light dawns on us:—May this we are doing be for the worst rather than for the best, and may the old practices taught to us have rested on a false foundation? If these things were thought of, then our position would be better understood and our actions more correctly appreciated. I believe those who are most severe upon us would be most considerate under this discipline of reason if they would give it trial, and that the very impulses of kindness, I will even say of tenderness, that lead many to oppose experimental inquiry would actually make them experimentalists if they could once realise the highest responsibilities that devolve on the medical scholar. Nay, I am not without hope that my jesting critic himself, if he ever had to stand, as we physicians have to stand, over the body of one of his fellow men, who, in the midst of health had just passed into doubtful death: if this critic, I say, had to stand there wondering what he should do to recal the life, uncertain whether what he was about to do were for the best or the worst; he, I think, would lay aside *Gil Blas*, would be humanely tempted, to risk the sacrifice of the life of a lower for that of the higher animal, and would transfer the rabbit he had provided for his dinner, to the experiment room instead of the kitchen.

BENJAMIN W. RICHARDSON

(To be continued.)

OUR ASTRONOMICAL COLUMN

HUTH'S "MOVING STAR" of 1801-2.—At the beginning of the present century, when, although Bode and some few others had been looking forward to such a discovery, astronomers generally were startled by Piazzi's accidental detection of the small planet Ceres, we read of observations of more than one so-called "moving star," which, after progressing slowly for a short interval, finally disappeared. The most singular narrative refers to an object said to have been remarked by Hofrath Huth, at Frankfort-on-the-Oder, on the night from December 2 to 3, 1801, particulars of which were communicated to Bode in several letters during the ensuing five weeks. If the observations are *bonâ fide*, there is yet a mystery attaching to the object to which they relate. Huth was one of the three independent discoverers of the periodical comet now known as Encke's, on October 20, 1805, Pons and Bouvard sharing with him an almost simultaneous discovery, and he did other astronomical work. Writing to Bode on December 5, he says: "In the night from the 2nd to the 3rd of this month, I saw with my 2½-feet Dollond, in a triangle with θ and δ Leonis to the south-west, *a star with faint reddish light, round, and admitting of being magnified.* I could not discern any trace of it with the naked eye; it had three small stars in its neighbourhood." He writes again on the 15th, that unfavourable weather had allowed of his observing the object only on three occasions, which appear to be on the early mornings of the 3rd, 13th and 14th, and he concludes from his observations that it had a slow retrograde motion to the south-west. From the 13th to the 14th, by eye-estimate, it had retrograded 4′ of arc, and from the 3rd to the 13th at most 30′. He forwarded to Bode at this time a diagram of the neighbouring telescopic stars. On December 21 he writes again that he had only succeeded in observing his moving star on one additional night, that of December 19–20, when he found it "near four stars apparently situate to the westward, about half a diameter of the full moon below a smaller one." Its path appeared directed towards i Leonis and towards the ecliptic. He adds: "Of the motion of this planet-like star I can now no longer doubt, since I have observed a difference of $\frac{8}{9}°$ nearly, between its positions on the 3rd and 20th." In a fourth letter, dated 1802, January 12, he informs Bode that he had seen the star on two later nights, those of the 1st and 2nd of the same month from 11h. to 14h., with many telescopic stars in its vicinity, of which he enclosed a diagram, by eye-estimate only, with the path of the object.

He mentions that on January 1 the star was even smaller than one of the satellites of Jupiter, and on the following night he had difficulty in perceiving it in close proximity to a star towards which it was moving. On the 5th he could discern only now and then, to the right of the star, on the left of which it was situated on the 1st and 2nd of January, and at a very small distance from it, a glimmer, but the star's former place on the left was vacant. He concludes that the object must have been receding from the earth, and might perhaps have been more distinct and larger before December 3. On the night of January 6 there was no trace of it. He closes this final letter by saying that he would have gladly learned that some other astronomer had observed this star and confirmed its motion, and expressing his regret that Bode had not succeeded in finding it. On the latter point Bode remarks that the weather during December had been but very rarely favourable for observation, and in the few moments that the sky was clear he had occupied himself with his "Seeker" and Dollond, partly in giving attention to the neighbourhood of Huth's star, and partly to the region in which Ceres was expected to be recovered on her second appearance. He also remarks on the imperfect manner in which the star's positions had been communicated to him, but concludes that "without doubt it was a distant comet," and its great distance caused it to appear without nebulosity. He supposes it on December 3 to have been in longitude 156° 20′, with latitude 10° 40′ north, and on January 2 in 154° 20′, with latitude 8° 50′. Huth's rough diagrams are reproduced in the *Berliner Jahrbuch*, 1805,

but they are on a very small scale, and no two persons are likely, perhaps, to agree as to the inferences to be drawn from them. We may remark, however, that the arc of great circle between Bode's extreme positions exceeds the length of the path, as described in Huth's letters. The following places result from an examination of the figures with the particular view to identify several of the telescopic stars entered in the larger diagram :—

1801, Dec. 3.	Longitude ...	157°0	Latitude	+ 10°5
,, ,, 14.	,, ...	156·7	,, ...	∓ 9·9
1802, Jan. 1.	,, ...	156·2	,, ...	+ 9·1

Calculations founded upon the deductions from Huth's diagram lead to no satisfactory, indeed no probable, results. The ordinary formulæ fail, but the distance of such an object could hardly have been great.

With regard to the *bona fides* of Huth's observations, it is worthy of remark that he wrote several letters to Bode, while according to his own showing, observations would have been very practicable, but for the unusual prevalence of clouded skies; while there is no doubt of the looseness with which he gave its positions.

Next week we shall refer to a similar astronomical puzzle, or myth, as perhaps some readers may be disposed to consider it.

VENUS IN INFERIOR CONJUNCTION.—Mr. J. Birmingham, Millbrook, Tuam, writes:—"In a careful measurement of Venus at the late inferior conjunction, I found proportionally that the full diameter was no more than 200, while a perpendicular from centre of line between cusps to the limb was from 145 to 150."

THE AUGUST METEORS.—The earth arrives at the descending node of the third comet of 1862 in the track of which the August meteors are supposed to circulate, about midnight, on the 9th inst. The comet itself is distant from the earth 27·8 times the distance of the earth from the sun, requiring yet some forty-seven years before the aphelion point will be reached, and it once more begins to approach these parts of the system. Though it will soon attain a distance from the sun equal to the mean distance of Neptune, its heliocentric latitude is so large, there cannot be any near approach to the planet. The ascending node falls not far from midway between the orbits of Saturn and Uranus, while as is well known at the opposite node, its path almost meets the track of the earth, less than two distances of the moon separating them.

THE KEW GARDENS REPORT

DR. HOOKER'S report on the celebrated gardens under his direction contains this year some facts that will be noted as starting-points in the history of scientific progress at Kew. Thus at the outset we are reminded that a sum of money was included by the Government in the estimate of last year for the purpose of erecting a new building for the herbarium in which will be deposited not only the unrivalled collections of dried plants, but also the valuable library, MSS., and collection of drawings of plants. The great importance of a fire-proof building in which to deposit these valuable treasures, cannot be over-estimated. The old house once occupied by the late King of Hanover, in which the herbarium is now and has been contained for nearly a quarter of a century, has become literally crammed; therefore, both on the score of safety and convenience, the new building which has been commenced since Dr. Hooker wrote will be welcomed by botanists of all nationalities.

Another point in the future history of the Gardens is the erection of a laboratory. Dr. Hooker points out that one of the recommendations of the Commission on Scientific Instruction and the Advancement of Science was, "That opportunities for the pursuit of investigation in physiological botany should be afforded at the Royal Gardens at Kew." To carry this out, T. J. Phillips Jodrell, Esq., M.A., generously placed the sum of 1,500*l.* at the disposal of the authorities, out of which the building has been erected, and will be fitted with apparatus for chemical, physiological, and microscopical work. The design for this building, in which we anticipate a great deal of interesting work will be conducted, is exhibited in the Loan Collection at South Kensington. It is pleasing also to note that "the lessons given to the young gardeners in the evening, in chemistry, meteorology, structural and economic botany, and upon which the attendance is voluntary, continue to give satisfactory results." These lessons, with demonstrations from such rich collections as those of Kew, cannot fail to impart a sound knowledge on those subjects immediately connected with botany, and to prepare the *employés* for important posts in India and the Colonies. Many plants of botanical interest, as well as of economic value, have flowered in the Gardens during the past year for the first time in this country, and have been figured for the most part in the *Botanical Magazine*. With regard to the Blue Gum (*Eucalyptus globulus*), about which so much has recently been written, Dr. Hooker points out that the plant having been so largely distributed and planted, will probably prove to be useful in another way—that of a timber tree, in countries not too hot for its growth. "On the Neilgherries, where Australian trees have been largely introduced, one of the most valuable, the *Acacia Melanoxylon*, proves to be all but valueless, owing to the ravages of various Loranthaceous parasites. The *Eucalyptus globulus* is, however, reported by Dr. Bidie to entirely escape their attacks. He attributes this immunity to the 'deciduous bark, the seeds' (of the parasite) 'thereby being dislodged before they can germinate and gain a hold.'" Liberian coffee, which is of a more robust habit, and produces larger seeds than the *Coffea arabica*, has been distributed with uniform success to most of the coffee-growing countries, foreign or colonial, foremost among them being Bahamas, Bangalore, Barbadoes, Bermuda, Calcutta, Ceylon, Dominica, Jamaica, Java, Madras, Mauritius, Montserrat, Natal, New Grenada, and Rio de Janeiro.

The introduction into India of the South American rubber-producing plants has occupied, and is still occupying, considerable attention. The successful acclimatisation of the Para rubber-tree (*Hevea brasiliensis*), as well as of the Central American plant (*Castilloa elastica*), is a matter of great importance, affecting as it does our future supplies of this invaluable substance. Of the peculiar and interesting plant, *Pringlea antiscorbutica*, or Kerguelen's Land cabbage, Dr. Hooker announces the receipt of seeds both from the *Challenger* and Transit of Venus expeditions, although, however a number of fine young plants were raised, they have nearly all since perished, a similar fate having befallen those at the Botanic Gardens of Paris, Cape-town, and Edinburgh, showing that the plant is very intolerant of warmth.

In the Museums where the collections are constantly increasing, one new feature is specially noticed, that of the separate collection illustrating vegetable teratology and pathology. This collection has rapidly increased since its formation two years since, and will, no doubt, in course of time, prove valuable to students in these interesting branches of botanical science, the more so as no public collection has hitherto existed of this kind, the materials consequently being scattered far and wide.

The herbarium has been considerably enriched during the past year, notably by the collections of the late John Stuart Mill, who, besides his other achievements was a diligent collector, and a good botanist; also from other private collections, as well as those of the *Challenger* and Transit of Venus expeditions.