

Volcanic Dust, the "New Bishop's Ring," and Atmospheric Absorption

DR. ROTCH (vol. lxxviii, p. 623) may, from experience, know whether this phenomenon is more prominent in the United States than in Europe, and better than can be ascertained by simply collating reports of the sky appearances as seen by different observers in the two continents, but he is mistaken in supposing that the phenomena in question have not been mentioned in European journals, as he will find a full description of the "New Bishop's Ring" in your pages (the issue of December 25 last, p. 174), particularly as observed at Sunderland.

As stated there, there was at first a striking difference from the Krakatoa "Bishop's Ring" in dimensions, but while very variable in size, it was afterwards in general reduced to more nearly the size of the Krakatoa circle.

Since the Krakatoa phenomena this circle has rarely been wholly absent about sunrise and sunset, though for some years was faint, so far as my experience goes, until July, 1902. Whether it existed at all before the autumn of 1883 I cannot say, as one's attention was not directed to it until it became conspicuous. On its recrudescence last year it did not become visible at other times than sunrise or sunset, so far as I noticed, until August 1, and it was not until some months later that it became conspicuous in the full day-time. I can reply to the inquiry of M. Forel in your issue of August 27, p. 396, that the circle is now plainly visible, not intermittently, but always, and not only about sunrise and sunset, but in the day-time; and not only at high altitudes, but at the sea-level also. But my experience so far agrees with M. Forel's that I found in a visit to Switzerland last July and August that the higher one ascended the more conspicuous the circle became—up to a certain point at least; I did not ascend higher than 8100 feet.

In answer to Prof. Langley (p. 5) I may say that I have not noticed a single night this year or last winter when the atmosphere appeared to be normally clear, stars at a low altitude having never been clearly seen here. I had also an impression as to the want of clearness during my visit to Switzerland, but I have not yet made calculations on the observations I made for absorption. During the day-time this want of clearness has not been at all observable, the sky outside of "Bishop's Ring" having been very frequently of a beautiful blue. I note that Prof. Langley makes the abnormal absorption increase towards the violet end of the spectrum. This seems at first sight rather contrary to the circumstance that I have occasionally noticed an unusual paleness of the sun when a few degrees off the horizon; indeed, it has sometimes appeared of a slightly greenish yellow, but possibly the relative clearness shown by Prof. Langley's table at μ 0.60 may have some connection with this.

I am surprised that Prof. Langley does not attribute this condition of the atmosphere to the volcanic dust. This would seem to me much the most probable explanation.

T. W. BACKHOUSE.

West Hendon House, Sunderland, November 23.

Action of Radium on Bacteria.

CONTINUING the experiments of one of us on the action of radium bromide on plants, we have experimented on various bacteria. We find that, in the case of *Bacillus pyocyaneus*, *B. typhosus*, *B. prodigiosus*, and *B. anthracis* in agar culture medium the β radiations from radium bromide exercise a marked inhibitory action on growth. Exposure for four days at a distance of 4.5 mm. to 5 mgr. of radium bromide does not appear sufficient to kill the bacteria, but is adequate to arrest their growth and to maintain a patch on an agar plate, inoculated with any of these organisms, sterile. A broth tube, however, inoculated from this patch has in most cases developed the organisms, showing that while the growth is inhibited in the patch all the organisms there are not killed.

HENRY H. DIXON.
J. T. WIGHAM.

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MEDICAL SCIENCE AND THE ANTI-VIVISECTIONISTS.

THE vindication of law and common sense exhibited by the substantial damages awarded to Dr. Bayliss after a trial occupying the Lord Chief Justice and a special jury for four days must afford the greatest satisfaction to everyone who is aware of the long course of systematic persecution which has pursued all those who devote themselves to the scientific side of medicine, and culminated in an attack by Mr. Coleridge on Dr. Bayliss and Prof. Starling, and on University College where they work.

There are many points of interest in this particular battle between a heavily subsidised society and its victim, to some few of which we may briefly refer—but of greater interest in reality are those aspects of this case which illustrate the immemorial conflict between knowledge and ignorance.

It is amazing that in the twentieth century, when it is at length recognised, even in this country, still lagging far behind its Continental rivals, that throughout the whole field of education practical instruction is of paramount importance, we should see one scientific witness after another pressed to explain why it should be necessary for a proper comprehension of the functions of living bodies to see the parts of those bodies in motion. The most intricate machine in the world is simplicity itself compared to any living body, but who could be trusted to repair a watch, a motor car, or a marine engine who had never seen their mechanism in action? Who would trust his life to a pilot who had never been to sea, to a physician who had never studied by the bedside, or to a surgeon who had never witnessed an operation? Would anyone try to teach a child the scent of a violet out of a book? Yet in this case, so happily and justly decided against Mr. Coleridge and his Society, an eminent counsel has asked again and again why students need concern themselves with any more practical physiology (the foundation of all the knowledge they can acquire) than they can learn from the pages of a book, while to support such a plea pseudo-scientific witnesses living and dead were quoted as deliberately asserting that practical instruction is wholly superfluous.

No single error has done more to hinder the progress of medicine in the past than the common attempt to deduce function from structure without direct experimental verification. Yet in the face of the clearest lessons this fallacious method is continually urged upon us as if its utility was self-evident; of this illustrations could be cited almost without limit. The error of Erasistratus that the arteries did not contain blood, apparently supported by anatomical observation, blocked the road to knowledge for 500 years, and was only dispelled at last by Galen's simple experiment of tying an artery in two places in a living animal and opening the vessel between the ligatures. A late obstetric surgeon, whose mischievous prejudices were received with such faith and quoted with such reverence by the anti-vivisectionists, so little understood the information and arguments of the early anatomists that he imagined they had never seen blood flow from an artery, and would have been convinced of their error if they had done so. Another of his "professional convictions" was that the circulation of the blood could easily have been discovered by anyone with a syringe and a dead body, though he must have known that the syringe and the dead body had been in the hands of anatomists from the time of the Pharaohs at least, and that Malpighi, who discovered the capillary circulation by direct observation of the living frog, had previously been entirely misled by attempts to inject the blood vessels in dead animals. Harvey discovered the circulation of the blood by con-