

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

The Holy Shroud of Turin.

WHILE thoroughly agreeing with Prof. Meldola's remarks regarding Dr. Paul Vignon's *Étude scientifique* of the remarkable relic known as the Holy Shroud, reviewed at p. 241 of the current volume, there are a few points which he has not enlarged upon, but which may possibly deserve attention and show how largely imaginary and unsupported by the records Dr. Vignon's theory is. No valid determination of the nature of the impressions or of the manner in which they have been produced can, of course, be made without a critical examination of the relic itself, so that any arguments based upon mere assumptions must be purely hypothetical.

First, as regards the possibility of the negative impressions being produced by painting or some analogous method. Dr. Vignon rejects this absolutely on the ground that no one in the Middle Ages had the knowledge for producing them by handicraft, the difficulty of producing a negative picture pictorially or of painting on linen with gum or albumen as media without the colour flaking off, while the linen is too supple to have been painted in oil. If he had consulted the early treatises on painting, some of them dating from long before the fourteenth century and handing down processes derived from ancient Greek art, he would have found descriptions of methods of tracing and transferring pictures which might have modified his opinion. For instance, in Didron's "Manuel d'Iconographie Chrétienne," which contains a translation of a treatise on painting founded on the teaching of the twelfth-century painter Manuel Panselinos, of Thessalonica, we find (p. 15) that the practice of making tracings from pictures for copying purposes was common, and again (p. 17), the opening chapter of the treatise is devoted to this subject, and a method is described of taking a coloured transfer impression on paper from any kind of painting, whether on oiled paper, panel or fresco. It was sufficient to paint in the general outlines, the rest being filled in afterwards. This, at any rate, shows that the early painters of the Middle Ages had sufficient knowledge of technique to produce reversed impressions from paintings, and it seems not unlikely that the impressions on the Turin relic were produced by some method of this kind from an original positive painting. Various traditional methods of tracing pictures may be found in Mrs. Herringham's recent translation of Cennino Cennini's "Trattato della Pittura" (1437) and in Mrs. Merrifield's collection of "Original Treatises dating from the Twelfth to the Eighteenth Centuries on the Arts of Painting." In the latter work, we also find mention of myrrh and aloes being used as ingredients in oil or spirit varnishes and lacquers, while aloes seems to have been used alone as a yellow glazing pigment analogous to our "brown pink." Caballine aloes is recommended by Leonardo da Vinci for improving the colour of verdigris or for use by itself. Should aloes be actually present in the impressions on the relic, as Dr. Vignon believes, though there is no evidence of it, the fact of its being used in the above manner may offer an explanation. In the above treatises also, there are several references to methods of painting on linen with yolk of egg, thin size and other media in such a way that the cloth would bear folding without injury to the colours or gilding, so that this objection disappears. Chifflet (p. 108) mentions the use of a spirituous tincture of cloves and cinnamon in depicting Phillip II. of Spain in his shroud (*voiles*).

A far more important point against his theory, which has been quite overlooked by Dr. Vignon, is that the best modern authorities seem to be agreed that the "aloes" mentioned in the Bible is not to be confounded with the ordinary medicinal drug, but is the perfume known as "lign-aloes" (Hebrew, *Ahalim*), or the resinous wood of *Aquilaria Agallocha*, which grows in India and other parts of the East (Hanbury, "Scient. Papers," p. 263). The better qualities of this wood have a fine perfume when shredded, and it seems to have been used in that state mixed with myrrh and spices. It is mentioned by J. B. Porta in the *Magia Naturalis* as a perfume. Pingone, in his history of this relic ("Sindon

Evangelica," p. 22), in a hymn dated 1562, alludes to myrrh and fragrant aloes brought from India and Arabia, the former being an essentially Arabian product. If this or a similar resinous perfume is really referred to by St. John, the only evangelist who mentions aloes, Dr. Vignon's theory at once falls to the ground, because he distinctly alludes to the drug which contains aloin and aloetin and is darkened by the action of ammonia, while, so far as I have been able to ascertain from specimens of the wood and resin of *Aquilaria Agallocha*, from Assam, ammonia produces only a very slight coloration of their tinctures or of linen soaked in them; and as either the wood or the resin would no doubt have been used in the dry state, any slight darkening of their solutions by ammonia would not affect the question of production of the images on the relic. Dr. Vignon assumes that the myrrh and aloes were mixed with olive oil, but there is nothing in the sacred records to that effect. If any such oily mixture were used, the relic could not fail to still bear traces of it and be strongly discoloured all over, regarding which nothing is said by those who have seen it, nor is it so shown in the photographs.

We now come to the "vaporographic" images, and it must be distinctly noted that while putting forward this theory as absolutely explaining and authenticating the impressions on the relic, Dr. Vignon has produced no shred of definite proof in support of it beyond the very partial success of a rough experiment with a plaster of Paris cast moistened with ammonium carbonate, and two failures, together with the opinions of certain eminent physiologists as to the possible decomposition of the excess of urea present in morbid sweats producing ammoniacal fumes, by the action of which on the aloes in the linen he claims that such impressions could have been produced in gradation according to the law of distances.

I have made several experiments on the lines indicated by Dr. Vignon with moulded figures made of flour paste and gelatine mixed with dilute solution of ammonia, so as to act on fine linen cloths soaked in various preparations of Barbadoes, or, by preference, Socotrine aloes, but in no case have I been able to obtain the semblance of a clearly shaded image, of parts close to the cloth or within the limit of distance of 1 cm. given by Dr. Vignon. There has always been diffusion, as must necessarily occur by the accumulation of vapour under the cloth, and an entire absence of any delineation, though in some cases there has been an increased darkening of the cloth immediately above the highest parts of the object. If this is the case with dilute ammonia, it is not likely to be otherwise with any product of the decomposition of urea from morbid secretions, but this is a question for pathologists. The most sensitive surface tried was prepared with a mixture of myrrh and Socotrine aloes rubbed up with cedar-wood oil—the latter substance being sometimes used in funeral ceremonies in the East. On one cloth prepared in this way, there is just an indication of a face, which was very roughly moulded in flour paste mixed with ammonia, and a certain amount of vaporographic action, but with no gradation or detail as is shown in the photographs of the relic.

So far as my experiments have gone, I feel almost convinced that if a body were wrapped or wound in a linen cloth, under the conditions stated in all the Gospels, it would be absolutely impossible for such a detailed impression as that shown on the relic to be produced in the manner suggested by Dr. Vignon, even supposing that medicinal aloes were used, as they sometimes were, like colocynth among the Egyptians, as a preventive against vermin. Bearing in mind, however, the bad record of the relic, remarkable as it is as a work of art, and the fact that it is not considered authentic by the authorities most qualified to judge, any further discussion of Dr. Vignon's theory seems of little importance apart from the possibility of "vaporographic portraits" being produced in the manner he has indicated, but by no means substantiated.

It is, I think, greatly to be regretted that Dr. Vignon should have brought forward his theory with such an array of quasi-scientific authority and argument based on so very slender a foundation.

J. WATERHOUSE, Maj.-General I.A.

January 23.

THE accompanying outline is a reduced photographic reproduction of my tracing from Signor Secondo Pia's positive photograph of the Holy Shroud, as referred to by Prof. Meldola (NATURE, pp. 241-243), and a glance at it is sufficient to show that the original is an inferior (much faded) mediæval