

LETTERS TO THE EDITOR

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Liquid Hydrogen.

THE letter of W. Hampson, which appears in your issue of May 26, can only mean by implication to charge me with having utilised without acknowledgment an idea of his, conveyed through a third party, in my paper on the liquid hydrogen jet, published in 1895. Such a suggestion is absolutely without any foundation in fact. My results would have been attained had Dr. Hampson never existed, just as they have been developed. He certainly in no way contributed directly or indirectly to the success of those hydrogen experiments. Had Mr. Hampson attempted to consult me as to his plans, I should have declined to entertain them, just as I had treated, under similar circumstances, distinguished colleagues engaged in low temperature research; for no other reason than to avoid the possibility of controversy. Further, I never would have allowed my assistant either to consider or advise on the projected scheme of some other person about to engage in the same field of investigation, simply because such a position would be quite unprecedented, and certain to result in misunderstandings. W. Hampson is the only inventor or investigator who has not in a straightforward way approached me directly in such matters, and it is no excuse for his dubious course of action to say he had an "introduction." My assistant has explained his position in the matter in letters addressed to "*Engineering*" within the last few weeks. The paper of 1895, on gas jets containing liquid, has been a fruitful source of recrimination. No less than three patentees of low temperature apparatus—viz. Solvay, Linde and Hampson—have each recognised in its contents part of the essential subject-matter of their respective patents. It will be for these gentlemen to fight the matter out. Suffice it to say, that the statements made in my paper of 1895 remain a correct record of facts. Further remarks on the subject can be found in the *Society of Arts Journal* for March 1898; made during the course of a discussion on the Linde process.

The Hampson patent was not published before April 1896, and the first exhibition of the working apparatus took place towards the end of March of the same year; or some three months subsequent to my Chemical Society paper. Mr. Hampson declares in his letter that he "*was afterwards the first in this country to liquefy air and oxygen without employing other refrigerants.*" Now, in my paper of 1895 the following passages occur:—"With such a simple apparatus and an air supply at 200 atmospheres, with no previous cooling, liquid air begins to collect in about five minutes, but the liquid jet can be seen in between two and three minutes." "In the above experiments air is taken at the ordinary temperature, which is a little above twice its critical temperature, and is partially transformed in a period of time, which in my experiments has never exceeded ten minutes, simply and expeditiously into the liquid state at its boiling-point—194°, or a fall of more than 200° has been effected in this short period of time." J. DEWAR.

May 30.

Printed Matter and Photographic Plates.

IN connection with this subject it does not appear to be generally known that photographic negatives, after they have been developed and fixed, and especially if they have been intensified by means of the bi-chloride of mercury and ammonia process, are often strongly impressed by prolonged contact with printed matter. I first observed this many years ago, and have a large number of negatives in my possession which show the effect very strongly. I enclose a photographic negative taken by myself in 1882, which has remained since 1886 wrapped up in the accompanying advertisement sheet of the *Electrician*. As will be observed, the greater portion of the print in contact with the film is clearly legible. It is, however, worthy of note that it does not appear to be the printer's ink in this case that has produced the chemical action, but rather the paper itself, or some ingredient therein. Those portions of the film protected from contact with the paper by the ink have retained their original colour, while the other portions not so protected

have become very considerably bleached. The printing on the side of the paper removed from the film does not seem to have had any effect.

It has probably been noticed by others that ordinary albumenised and sensitised photographic paper is also strongly affected in the course of time by contact with printed matter. In this case, also, the printing comes out as white lettering upon a darker ground. A. A. C. SWINTON.

The Transport of Live Fish.

YOUR readers may be interested to know of an experiment with the transport of live fish I am making, and so far successfully. I left Brisbane on April 16, taking with me four specimens of *Ceratodus*. This remarkable fish is doubtless sufficiently well known to your subscribers to render a description on my part unnecessary. D. O'CONNOR.

S.S. *Duke of Devonshire*, Colombo, May 16.

CEREMONIAL DANCES OF THE AMERICAN INDIANS.

READERS of NATURE do not need to be reminded of the important work being done by the Bureau of American Ethnology, which is conducted under Act of Congress "for continuing ethnologic researches among the American Indians under the direction of the Smithsonian Institution." The value of the researches that are being carried on, and the results of which are issued in the form of annual reports and bulletins, cannot be over-estimated; for the Indian customs and beliefs, which form the subject of the majority of the papers, are not destined to survive for many years. The Indian reserves are gradually being curtailed, the Indians themselves are slowly becoming civilised, and this process is naturally attended with change and decay of their primitive ceremonial and belief. It must be admitted that the Indian nature is slow to change, and retains its tribal instincts under a veneer of civilisation. In fact, the case of a young Arapaho Indian, who, though speaking good English and employed as a clerk in a store, thought it but natural that he should join his tribe in dancing the sun-dance for three days and nights without food, drink or sleep, is far from exceptional. But the change, though gradual, is constant, and at no distant period the American Indian will have ceased to furnish the anthropologist with opportunities for the study of primitive man. When that time arrives the value of these reports, compiled by trained observers in accordance with a scientifically organised plan, will be unique.

The present article is concerned with three of the papers published in the fourteenth, fifteenth and sixteenth annual reports of the Bureau. These papers may be classed and considered together, as they deal with certain ceremonial dances still practised by many of the Indian tribes. The longest of the papers is that entitled "The Ghost-dance Religion and the Sioux Outbreak of 1890," which is contributed by Mr. James Mooney, and is published in a volume by itself as Part ii. of the fourteenth annual report. The underlying principle of the ghost-dance is the doctrine that at some future time the whole Indian race, whether living or dead, will be reunited in a life upon earth untroubled by the fear of death, hunger, or disease. Most Indians hold that this change will be brought about by spiritual powers who will require no assistance from men, but at times of discontent medicine-men have sought to anticipate the Indian millennium by preaching a crusade against the further encroachments of the white population, and persuading their fellow tribesmen that in this resistance they will have the active support of their dead ancestors and relatives. Such a revival took place in 1890 among the Sioux, the largest and strongest Indian tribe in the United States. The cause of the outbreak may be traced to irritation at the encroachments made on their reserve,