LETTERS TO THE EDITOR.

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Plated Teeth of Sheep.

TWICE in recent years I have had brought to me by different people, as great curiosities, teeth of sheep or lambs, some of which were partly covered with a bright yellow metallic-looking film, which was thought to be gold. One of the persons referred to, as a foreign meat purveyor, had had a large experience with carcases of sheep, but had not observed the peculiarity before; and none of the farmers whom I questioned about the matter had ever seen or heard of it. But whether it is actually so rare a phenomenon as the above remarks suggest is doubtful, for the Rev. John Morton, in "The Natural History of Northamptonshire," published in 1712, p. 50, says :—

"Whether it be owing to some accidental uncommon Property in the Soil, that the Teeth of certain Sheep, and Cows, are tinged with a Golden, or rather Brazen Colour; whereof they have had instances in Staffordshire, as also here in this County, and of which I have now by me a pretty remarkable Sample that I met with at Oxenden; or whether it be owing to the feeding of Cattel upon yellow-flower'd Plants or to some other Cause, I shall not now stay to examine."

Actually, of course, the yellow film referred to consists of iron pyrites, and seems to require for its formation the concomitants of ferruginous matter, sulphates, and anaerobic bacterial action. Bacteria in the decomposing organic matter on or around the teeth may be supposed to reduce the sulphates with evolution of sulphuretted hydrogen, which latter reacts on the available iron to form the iron pyrites, FeS_2, a well-known chemical reaction commonly occurring in Nature under anaerobic conditions. It is consequently reasonable to suppose that the particular sheep, etc., exhibiting the characteristic spoken of, that of plated teeth, had been drinking water charged both with iron and sulphates.

Now most chalybeate waters are bog waters, where humic acids have first dissolved the iron, and then on oxidation deposited it in the form of the hydrated peroxide of iron, when sulphates may or may not have been present. But some chalybeate waters (including some bog waters), besides depositing iron, yield abundance of sulphates of iron, or calcium, or both; then obviously the original source of the iron was iron pyrites, probably marcasite. It would appear that this latter class of water would especially lead to the plating of the teeth of animals using it.

I should be rather glad to know of any instances where the result referred to could be actually traced direct to its cause. BEEBY THOMPSON.

67 Victoria Road, Northampton, May 19.

J. E. B. Mayor and Todhunter.

THE review of Dr. MacFarlane's "Lectures on Ten British Mathematicans" in NATURE of May 17 closes with a quotation about Todhunter.

The words cited are attributed to Prof. Mayor, but a note of interrogation seems to imply some uncertainty as to which of the two brothers Mayor it was who wrote them. The quotation is from the late professor of Latin, *John* E. B. Mayor.

On the death of Todhunter Mayor wrote an "In Memoriam" notice of his old friend. It appeared in three consecutive numbers of the *Cambridge Review* for 1884. The first instalment appeared in the number for March 5. The quotation in NATURE is from the number for March 19, p. 262, col. 1.

Todhunter was not only a mathematician, but also a linguist. "Besides most European languages (including Russian, of which he learnt enough to master a mathematical treatise), he had studied Hebrew, Arabic, Persian, and Sanskrit. He was a sound Latin and Greek scholar" (*loc. cit.*, p. 229).

Unlike his great master, De Morgan, who is said to have been a skilful performer on both the organ and the tin whistle, Todhunter lacked the musical faculty. "He used to say he knew two tunes; one was 'God save the Queen,' the other wasn't. The former he recognised by the people standing up" (p. 261, footnote). EDMUND SYMES PAYNE.

27 Constitution Hill, Clifton, May 21.

THE REMOULDING OF NATIONAL ADMINISTRATIVE INSTITUTIONS.

IN the recently issued third annual report (1916) of the Carnegie United Kingdom Trust, and fifteenth annual report (1915–16) of the Carnegie Trust for the Universities of Scotland, there is evidence of the deeply adverse influence which the heavy hand of war has exerted in directions usually the most remote from strife and rancour. The width of the influence is very evident, too, for these reports deal with subjects so diverse as higher education, scientific and literary research, music, church organs, libraries, etc. In the case of the former trust it is remarked that, "while the past year may confidently be said to have seen progress made with the work of the trust, the war and its reactions on the ordinary activities of the country have necessarily hampered any rapid development of schemes which are not directly concerned with its prosecution. A philanthropic trust is peculiarly subject to the difficulties of the moment, especially when its efforts must be entirely devoted towards the amelioration of normal conditions." In the case of the latter trust it is remarked that "the operations of the trust under the Research Scheme still continue to be considerably affected by the European war." Fellows and scholars of the trust "have been engaged on military duty," and some "are among the fallen." "The influence of the war . . . is seen in the diminished number of candidates for fellowships and scholarships, and still more in the fact that of those elected one half either did not avail themselves of the awards or resigned in the course of the session to engage in other work. It is also seen in the altered character of the research work of the beneficiaries, which, except in one or two cases, instead of following the usual lines, was directed to the solution of definite problems arising out of the war."

One can remember readily the time when applications were received by the universities from America, but never from the United Kingdom, for honours graduates to direct the labours of, *e.g.*, cotton manufacturers or gardening firms. That the war has made this old condition an impossibility for the future became forcefully clear in the recent report of the Advisory Council of

the Committee of the Privy Council for Scientific and Industrial Research. The report of the Universities Trust exhibits the effective response of the universities to recent calls. The report of the Council makes very evident the need, long recognised by scientific men, of change—drastic change—in the methods of industry, and the need for collaboration in endeavour. It makes also very evident the need for the theorist to direct and expedite the labours of the practical man; and, more satisfactory still, it shows that the practical man is now recognising it widely under the stress of war.

The future age is to be the age of specialisation and co-ordination. An interesting example of co-ordination appears in the reports of the Advisory Council and the United Kingdom Trust. The former body gave grants to the Stoke School of Pottery in order to aid "a threatened industry." The latter acquired the unique Solon Ceramic Library and presented it to the Stoke School in the hope that it might "help to strengthen the high standard of a national industry."

The specialisation and the co-ordination are to be directed towards the placing of national efforts on the fittest bases and in touch with the fittest methods. It is largely isolation and the lack of specialised scientific control in commercial and industrial endeavours that have led to the critical conditions upon which the war has focussed attention. The Committee of the Privy Council has already done much towards the removal of some of these conditions, and has proceeded tentatively to the inauguration of means to remedy widely the lack of co-ordination and the neglect of specialised control. The constitution of the machinery of the committee for the effective attainment of its national aims is very ideal. The committee itself includes the heads of the various governmental departments concerned, and its Advisory Council and very large Standing Committees are formed of *working scientific and technical experts*, whose decisions must obviously be determinative.

But there exist many pre-war administrations —boards, trusts, etc.—on a smaller scale, and many post-war administrations will arise also on a smaller scale, yet, nevertheless, dealing with matters of importance to the nation. In the case of the former there must be revision, in the case of the latter there must be supervision, in order that the fittest constitution may be framed and followed. In matters of business the framing should be moulded on business lines, and not, for example, on legal lines, though a slight admixture of legal opinion might be desirable. In matters of education the administrators should mainly be trained educationists, and not, for example, business men, though a slight proportion of these might be of advantage when the administration deals also with its own funds. In a mixed body it is not infrequently found that the best business member is one who never had a special business training; nevertheless, there are certain aspects of business which can be safely guided only by a trained specialist. On the other hand, it must also be recognised that the lines of success in a trading firm or a manufacturing firm are fundamentally different from those in an educational institution. Trade and ordinary business are of the nature of a war with tendencies, which may be, and often are, successfully combated, towards selfishness and hardness. And this tendency might easily develop into a national curse. In not very remote history a subordinate body, composed mainly of business men, intending to be well-intentioned, but misled by a mischief-maker and to some extent under the influence of the heritage of old feuds, worked behind the back of a superior body and almost involved both bodies in an utterly ruinous litigation. In that process they attacked, also behind his back and without his knowledge, a man whose life, in connection with the matter regarding which they attacked him, could easily challenge that of any one of them; for it had, in that very matter, been one of absolute innocence. Such a performance could scarcely be imagined in the case of a body of jurists, whose training begets sensitiveness to justice; or of a body of scientific men, whose training begets sensitiveness to accuracy and truth; or even of a body of literary men or artistic men, whose training confirms the sense of beauty.

In every case the scientific test of fitness must be applied. In pure business, the business man; in pure technics, the technical man; in technical science, the practical man and the man of science equally, or the latter preponderantly in cases of doubt; in education, the trained educationist, must have the determinative voice. So also in other matters. It is no less an important point that the specialists must be men *actively engaged* in the work which is their specialty. Under no other conditions can the fullest efficiency be attained. Nor can it be attained with certainty unless these men are *in the majority* as regards either numbers or, at least, the weight effectively attached to their views.

When proved by these tests, of the three administrations here specially considered, only that of the Committee of the Privy Council seems to be of quite the fittest type. Although there is full internal evidence in the reports of the Carnegie Trusts that great weight is attached to expert advice, possibility should be changed into visible certainty. Nevertheless, one ought not to take cognisance of this condition without at the same time acknowledging, with full appreciation, the height of the aims of these trusts and the greatness of the results to which they have attained.

W. PEDDIE.

ANTISEPTICS, AND THE TREATMENT OF INFECTED WOUNDS.

FROM the beginning of the war the Medical Research Committee has paid special attention to the important subject of antiseptics in the treatment of wounds. The part taken by Sir Almroth Wright and the bacteriological depart-