a yellow substance giving a characteristic test for wound gum. This plugging is progressive.

The diseased roots on the average are able to transport but one fourth the amount of water carried by healthy roots, as determined by pumping water through lengths of diseased and healthy roots.

It is interesting to note that diseased roots contain little if any stored starch, while healthy roots are rich in that substance. The result of this lack of food supply is poor growth in the spring and a progressive weakened condition. Isolations from deep-seated diseased tissue constantly yield a fluorescent bacterium. Inoculations with this organism by root-cutting and injection into the roots cause discolorations and plugging of the vascular system identical with field symptoms. Check inoculations with water, physiological salt solution and other bacterial organisms isolated from rotted crowns failed to react in this way.

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THE DEFINITION OF LOESS

THE excellent summary with reference to the "Origin of the loess of the Palouse Region, Washington," given in SCIENCE of May the first, 1925, page 469, raises again the question of the proper use of the term loess. Is a deposit in a lake properly a loess?

As Grabau[1] briefly describes recent deposits of loess, they are chiefly wind laid deposits, may contain beds laid down in shallow water and may even contain beds of sand and gravel washed in by streams. He uses the term silt[2] in describing the size of the particles apparently as the word is used in soil surveys.

The present writer believes it is time to use the name loess with a definite meaning: a wind-laid deposit of loosely arranged, angular particles of calcareous silt loam typically intermediate in fineness between sand and clay, of uniform mechanical composition, often with color changes revealing faint lamination, and with a tendency to break off in vertical slabs.[3] This accords with the general use of the term. With the loess may be associated sheets of gravel which are not loess, but water laid. With it may also be associated beds of water-laid silt with shells of fresh-water molluscs. With it also may be associated a glacial boulder, but this boulder, though on the loess and surrounded by loess, is not loessial.

Failure to make such distinctions has been the occasion of misunderstandings in the past. The loess along Missouri River was in the early days thought to be a lake deposit. Later it was recognized as a wind-laid deposit with all the peculiarities of such a deposit. Later still, patches of silt laid down elsewhere in sheets of water in loessial areas and containing fresh-water instead of air-breathing molluscs were spoken of as if loess. It is well to distinguish between these classes of deposits and to use distinctive terms.

In describing any deposit we may recognize the source from which the material was derived, but the later deposit does not retain as its name the name of the material from which it was derived. A bed of sea sand is a marine deposit of sand regardless of the crystalline rock from which the sand was originally derived, and it is a marine deposit regardless of the agencies of river action that may have been involved in transportation. The fine deposits laid down by the wind are loess, regardless of the source of the material from which that loess was derived. It may have come from weathering of ancient rock, it may have come from soil or from alluvium along a recent river, but when laid down by the wind it is loess. When washed out later and laid down in water by a river it becomes a river silt (alluvium if on a flood plain). When laid down in the quiet waters of a lake it becomes a lake silt, along with such portions as may have been transported to that lake by streams, whatever the source of that fine material. Often one may be uncertain as to whether a given bed is a true loess. Then suitable terms should be used and the bed described accordingly.

If the term loess is thus confined to fine wind-laid deposits, as described, the term will have a definite meaning, which will accord with the general significance of the term.

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[1] A. W. Grabau, "Principles of Stratigraphy," pp. 565–568.

[2] *Idem.*, p. 565.

[3] Varied from Grabau, *idem*, p. 565.

QUOTATIONS

WHAT IS REASON FOR?

ABOUT sixty years ago Huxley made his famous answer to a precursor of Mr. Bryan. Wilberforce, Bishop of Oxford, had appeared before the British Association for the Advancement of Science and in the manner of Mr. Bryan congratulated himself that he was not descended from a monkey. Darwin himself was absent on account of illness, but Huxley was in the hall, and when Wilberforce had finished he rose and said in substance the following:

> If I had to choose, I would prefer to be a descendant of a humble monkey rather than of a man who employs his knowledge and eloquence in misrepresentation of those who are wearing out their lives in the search for truth.

Ostensibly the purpose of Mr. Bryan's outpouring of idiotic contempt for science and learning was to assert the glory of man, to prove that he came "from above" and is created in the image of God. We have never read a more blasphemous speech than Mr. Bryan's. For the whole purport of it was to hold up to ridicule and contempt, to discredit and malign, the one achievement of man that most clearly distinguishes him from all the rest of the animal kingdom. For surely if man is distinct from the other animals the distinction lies in his creation of science, in his power to extend his understanding of the universe. Mr. Bryan cries out that the wicked scientists are robbing man of his sublime ancestry. Mr. Bryan is robbing man of all sublimity now. For when, pray, does man rise to a greater dignity than when a Copernicus, a Newton, a Darwin or an Einstein makes some part of the universe intelligible? Has man a greater dignity when he makes political speeches for big fees and plays upon the fears of the ignorant?

The assumption that righteousness as well as divinity is a monopoly of Mr. Bryan's fundamentalist friends is an impudent conceit. Mr. Bryan talks as if he, for example, were a better man, better morally, than the scientists upon whom he pours his contempt. They won't answer him, but the answer can and should be made for them. The answer is this: to contribute successfully to the progress of science requires more integrity of mind, more purity of heart, more unselfishness, more devotion, more unworldliness, than any other kind of human activity. The work is harder, the standards are higher, the discipline is more rigorous, than men like Mr. Bryan have ever dreamed of demanding of themselves.

There are quacks and knaves among scientists, to be sure, but among the men who are really doing the work of science a moral code exists and is followed which would put the rest of us to shame. The search for truth. That is a simple phrase, but the labor, the care, the patience and the exactness which it requires are something beyond the comprehension of a man who has lived by flamboyant speeches. Has Mr. Bryan ever conceived, while he was on the Chautauqua as Secretary of State, or selling real estate in Florida, the quality of soul that is needed to induce a man to work thirty years over a microscope and then give his results, without a penny for himself, to all mankind?

The whole thing is beyond his ken. But at least he might be silent in the presence of men who are doing, if any men are doing it, the work God gave men brains to do. God did not make the human reason solely for use on the lecture platform. If the human reason has any purpose which may be called divine, that purpose is the full, free and fearless use of reason to understand the mysteries of the universe. —*The New York World.*

SCIENTIFIC BOOKS

Interfacial Forces and Phenomena in Physiology. By SIR WILLIAM M. BAYLISS. E. P. Dutton & Co., New York, 1923. 196 pages.

WITH the advance in our knowledge of the processes of living matter has come an increasing appreciation of the degree to which the underlying chemical reactions are controlled by the special physical structure of the protoplasmic system. Perhaps the most remarkable feature of the reactions determining the response of an irritable cell to stimulation is their susceptibility to electrical control; with this is associated a special sensitivity to the presence of surface-active compounds of all kinds. The general significance of these facts and their bearing on the problem of the structure of protoplasm have only recently been appreciated. Electrical sensitivity and narcotizability are universal properties of protoplasm.[1] These properties, however, are clearly based on surface-processes—the former depending on changes in the electrical polarization of interfaces (as Nernst first showed), and the latter on the displacement of reactive compounds from the protoplasmic surfaces (see especially Otto Warburg's recent work). The dependence of the metabolic reactions on protoplasmic structure thus appears to be essentially a consequence of their dependence on surface-conditions. Protoplasm is a colloidal system, bounded and partitioned by films with diffusion-proof or semi-permeable properties; hence it is a system in which the phenomena characteristic of surfaces or interfaces are exhibited in a highly developed form. Irritability, contractility, electrical and chemical sensitivity, distance-action (transmissivity) are now seen to be expressions of this all-pervading rôle of surface-forces in protoplasmic activity. There is also every indication that normal growth (which is similarly electrically sensitive and narcotizable) is based primarily on the deposition of structure-forming material at the protoplasmic interfaces. This view implies that a concentration or deposition under the influence of surface forces, in other words a process of adsorption (which is essentially oriented attachment of molecules to surfaces), plays a controlling part in the formation of new organized structure; at least it is difficult to conceive of any other physical means of securing the necessary structural regularity.

The manner in which chemical reactions in polyphasic systems are influenced by the special conditions at the phase-boundaries is evidently a subject of

[1] This was recognized by Claude Bernard in his "Leçons sur les phénomènes de la vie," and elsewhere.