This occurrence of Foraminifera is of great interest, taking into consideration the age of the beds; for, so far as I am aware, excepting the occurrence of the remains recorded by Dr. Cayeux from Pre-Cambrian beds in Brittany, and the foraminiferal casts in the Lower Cambrian of the Baltic Provinces described by Ehrenberg, these are more ancient than those of the well-known discoveries of Brady, Blake, Ulrich, and others, in beds of Ordovician and Silurian ages. So well preserved are these Upper Cambrian Foraminifera that the finely perforate structure can be seen here and there, which leaves no doubt as to their position as members of the Hyaline group of the Foraminifera. FREDERICK CHAPMAN.

Acquired Immunity from Insect Stings.

IN connection with this subject (see NATURE, vol. lv. p. 533, *et alibi*), it may be interesting to quote the following passage from "An Account of a Journey to Leetakoo," performed by a Dutchman, named Truter, in 1801 (appended to Sir John Barrow's "Voyage to Cochin China" (London, 1806), wherein the passage occurs on p. 382): "It was remarked that . . . the sting of a scorpion, which to Europeans and colonists is always attended with dangerous consequences, . . . has no ill effect on this people [the Bosjesmans], which they endeavoured to explain by saying that while children being accustomed to be stung by these insects, the poison in time ceases to have any effect on them, as the small-pox-virus loses its action on a person who has had the disease." KUMAGUSU MINAKATA.

October 11.

A NEW CLASS OF ORGANIC ACIDS.

A RECENT paper by Prof. Claisen in *Liebig's Annalen* (297, 1-98) is interesting, not only because it is one of a series of valuable contributions which he has published during the last few years, but also because it contains important observations on the occurrence of strongly marked acidic properties in certain hydroxymethylene derivatives.

Ever since Lavoisier attributed to oxygen the *rôle* of "acidifying principle," attempts have been made to assign a similar function to particular atoms or groups; and at the present time we say, that a substance possessing the properties of an "acid" contains, in addition to hydrogen or hydroxyl, some so-called acid-forming or electronegative atom or group of atoms. Consequently when we meet with an organic substance having in any degree the characters of an acid, we immediately associate these properties with the presence of this or that "acidifying principle." We account for the readiness with which the phenolic hydrogen atom is displaced by alkalis by saying that the hydroxyl group is influenced by combination with the electro-negative or acid-forming phenyl radicle; and we say that the reason why the alkali derivatives of phenol are decomposed by carbonic acid, whilst those of the nitrophenols are not so decomposed, is because in the latter the acid character of the hydroxyl group is further enhanced by the presence in the molecule of the nitro-group.

Phenol (carbolic acid) and nitrophenol, however, we do not usually call "acids," and we cautiously speak of their metallic "derivatives" and not of their "salts" in order to avoid the use of terms which might be misleading. Similarly we speak of the metallic "derivatives" of nitromethane, of ethylic malonate, of ethylic acetoacetate, &c., but we do not call the parent substances "acids."

It appears, however, that the time has now come when we must admit a new class of substances, namely, the hydroxymethylene derivatives recently prepared by Prof. Claisen, to the distinction of being called "acids." The substances in question may all be referred to the type $\begin{matrix}R.CO\\R.CO\end{matrix}\!\!>\!C = CH.OH$, where R represents either an alkyl-group (CH_3—, C_2H_5—, &c.) or an alkyloxy-group (CH_3O—, C_2H_5O—, &c.), and they are described by Prof. Claisen as follows:—They are all strong monobasic acids. They can all be accurately estimated by titration with normal alkali in aqueous alcoholic solution. They dissolve freely, even in the cold, in aqueous solutions of alkali acetates, liberating acetic acid. The determination of the electrical conductivity gave a value for K greater than that obtained for acetic acid. Among substances composed of carbon, hydrogen, and oxygen only, and not containing a carboxyl-group, they are doubtless the first which approach the monocarboxylic acids (excepting formic acid) in strength, and even surpass some of them.

The acid character of these compounds may of course be accounted for in the usual way, and, as Prof. Claisen points out, the substances may be regarded as formic acid, O = CH.OH, in which the oxygen atom has been displaced by the group $\begin{matrix}R.CO\\R.CO\end{matrix}\!\!>\!C =$, which itself contains the two electronegative radicles $(R{-}CO{-})_2$; nevertheless the possession of such strongly acidic properties by compounds of this kind is a fact of extraordinary interest and almost as disturbing to our preconceived ideas as was the discovery of an acid containing only nitrogen and hydrogen. F. STANLEY KIPPING.

DRAINAGE AND IRRIGATION WORKS IN MEXICO.

THE valley in which Mexico is situated is almost unrivalled for its beauty, and is encompassed on all sides by great mountain ranges clothed with cedars and pines. The land is extremely fertile, notwithstanding its elevated position of 7000 feet above the level of the sea. Although thus beautifully placed, and at such a great elevation, Mexico was considered one of the most unhealthy cities in the world, the death-rate amounting as high as 40 per thousand; the cause being the want of proper drainage. The valley forms an immense basin covering 2220 square miles, hemmed in with solid walls of rock, and having only two or three high passes out of it. The valley thus shut in formed at one time an inland sea, but owing to earthquakes and other causes the water gradually subsided until it became confined to six great lakes. Each of these lakes is fed by streams from the mountains, which in winter frequently cause the lakes to overflow and inundate the adjoining land. It was in the middle of this valley that the Aztecs founded their city of Tenochitlan, building their houses and temples on piles. Subsequently as the water lessened and the fear of inundation became less, the dwellings were placed on the water-logged ground.

This was the condition of the country when Cortez chose this site as the capital of New Spain. The old canals were filled up, the city was extended, and great walls built to keep out the water. The city, however, was subject to frequent inundation. In the seventeenth century, after a great flood, the water stood at the level of the second story of the houses for several years. Various attempts were made to obtain an outlet for the water, and in the seventeenth century a canal 10 miles in length, with a tunnel 10 miles long through the mountains, was constructed, in which 15,000 Indians were engaged, which partially answered the purpose for which it was intended. The tunnel subsequently became blocked after an earthquake by the sides falling in, owing to their having been only supported by timber.

The tunnel having become useless, it was determined by the Spaniards to open it out, but 150 years were allowed to elapse before this was finally accomplished in 1789. The excavation is 14 miles long, and measures about 300 feet in width and 180 feet in depth. Through this cut, which has assumed the appearance of a natural gorge, the Mexican Central Railway now runs. During the time the work was in hand the locality became depopulated, owing to the insatiable demands for labourers, and finally these had to be imported from