

scientific papers where the metrical system is used, it is to be inferred that they are capable of learning that system, which is not more difficult than the multiplication table of 10.

The prognostications of your correspondent I fear are of little value, for I find daily the metrical system is replacing more and more the barbarous standards. I know of some large English engineering works recently opened in Italy where all the English engineers, after a few months' absence from home, adopt the metrical system as far as the inch-calibred machinery will allow, and constantly grumble at the two-foot rule.

Lastly, allow me to state that once it was my practice to put old English equivalents by the side of the metrical measurements, but I dropped the practice because one Editor wrote to me saying that it was a presupposed fact that the readers of his journal understood the metrical system, and it might offend their dignity to be told the English equivalent of 2·5 centimetres, etc. Another Editor wrote that it was superfluous and added to the length of the paper.

Chemists and physicists have universally adopted the metrical system, mathematicians, astronomers, etc., prefer it, and I maintain that geologists—especially those who write for the future in the *GEOL. MAG.*—the least conservative of all scientists, should not be the last to give up an archaic if not an archæan system.

NAPLES, Oct. 14th, 1890.

H. J. JOHNSTON-LAVIS.

#### WIND WAVES AND TIDAL CURRENTS.

SIR,—Allow me to thank Mr. Stirrup for the invaluable information contained in his letter on "Wind Waves and Tidal Currents." It does not, however, affect the position taken up in my letter on "Tidal Action" as to the question of the action or inaction of *Tidal* currents on the floor of the English Channel. The Mediterranean being practically a tideless sea, the currents encountered by M. Fol could not possibly be Tidal, and herein lies the extreme value of the observations.

My investigation of wave-action was undertaken in order to prove the disturbing power of waves on the sea-bottom, and I proved my point up to the hilt, and indeed a little further, as the ascertained amount of disturbance exceeded what the theory of oscillating waves would allow.

In a paper submitted to the British Association in 1886, I pointed to the clean sand and shells in 100 fathoms and more at the mouth of the English Channel as evidence of the presence of wave-currents at a depth far below the reach of the heaviest oscillating waves, and said that "the presence of this deposit of clean sand and shells is at present unaccounted for, for there are no recognized agents competent to disturb and distribute such material below the depth of fifty fathoms;" at the same time I showed how a gale off Queens-town by the general disturbance of the water-level, stirred up seaweed in Torquay Harbour far beyond the radius of the atmospheric disturbance caused by the storm.

In a tidal sea it is impossible to isolate these far-reaching currents

from the ordinary tidal- and wave-currents, but now M. Fol in the tideless Mediterranean has done so, and what is of so much importance has clearly distinguished them from such wave- and tidal-currents. As already stated, M. Fol's currents cannot be tidal, but no more can they be attributed to ordinary storm waves, as Mr. Stirrup states that the disturbance is felt nearly as much at 30 metres as at 10 metres. This is also indicated by the character of the motion which is said to make the diver oscillate like a pendulum. An ordinary storm wave would impart more or less of a circular motion.

These wave-currents appear to originate in those swinging waves which, for lack of a better name, I have termed wind-pressure waves. They are moreover quite in their place in the Mediterranean, a sea which is subject to considerable changes of water-level from strong winds.

With respect to the English Channel, the tidal currents alone seem powerless to disturb the weakest organism, but occasional storms appear to hurl about gravel as though it were sand, and to give the fauna in general a decidedly bad time of it.

Mr. Stirrup's letter clears up the chief outstanding unexplained point in the problem of the action of waves and currents on the floor of the Channel, and I can only repeat my very sincere thanks for the same.

A. R. HUNT.

SOUTHWOOD, TORQUAY.

---

### MISCELLANEOUS.

---

**GEOLOGICAL SURVEY OF IRELAND AND THE ROYAL COLLEGE OF SCIENCE.**—We regret to learn that Professor Edward Hull, LL.D., F.R.S., severed his connexion upon the 30th September with the Geological Survey of Ireland, of which he has been Director for a period of nearly 21 years. He retires from the service consequently upon the completion of the one-inch Geological Survey of the country. Messrs. G. H. Kinahan, A. B. Wynne, R. J. Cruise, and W. F. Mitchell, have also retired from the service; Mr. Kinahan having served with distinction for a period of 36 years. A small staff has been retained, whose duty it is to keep the maps up to date, to give technical information to persons interested in mineral and similar developments, and to attend to the Survey collection now displayed in the new Science and Art Museum. Mr. J. Nolan (senior geologist) has been appointed chief of the local staff, and there remain with him Messrs. F. W. Egan, J. R. Kilroe, A. McHenry, Dr. J. S. Hyland, and Mr. R. Clarke (Fossil Collector). Professor Hull also resigns his position as Professor of Geology at the Royal College of Science, which he had held conjointly with the Directorship of the Survey. We have much pleasure in stating that Mr. G. A. J. Cole, F.G.S., who for several years has been assistant to Prof. Judd at the Normal School of Science, and has done much original work in Petrology, has been appointed to the vacant Professorship.