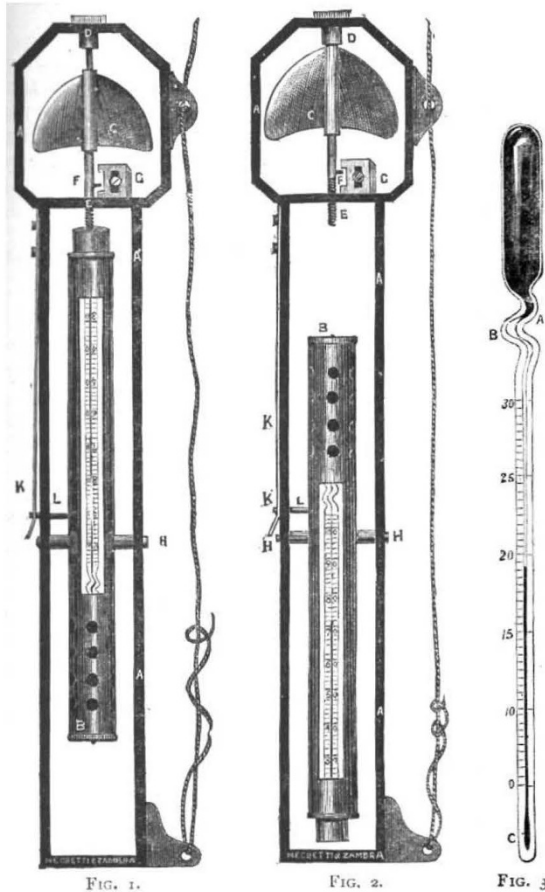


as with the weapon of combating the most fertile sources of infection. In preventing the distribution—either by proper disinfection, or by destruction—of the expectorations of tubercular persons, and further, in superintending and restricting the use of tubercular animals of the bovine species, we possess the means of preventing the spread of this deadly and terrible plague, and hereby saving a vast amount of human life. These discoveries of Dr. Koch were made entirely through experiments on living animals.
E. KLEIN

DEEP-SEA EXPLORATION

IN NATURE, vol. xviii. p. 348, we described Negretti and Zambra's Patent Deep-Sea Standard Thermometer. Some uncertainty as to the accuracy of its indications in deep sea service led to a re-arrangement of the instrument, which now greatly increases its reliability. The improvement is chiefly due to suggestions furnished by Commander Magraghi (see NATURE, vol. xxiv. p. 505)



(of the Royal Italian Navy) to Negretti and Zambra. Several of these improved thermometers may now be fastened on one line, and serial temperatures at any required depth obtained with certainty.

The woodcuts exhibit the apparatus, Fig. 1, as prepared for lowering down into the Sea, and Fig. 2 after the hauling up has commenced—the thermometer having reversed and registered the temperature at the moment of turning over. Fig. 3 shows the peculiar construction of Negretti and Zambra's inverted thermometer used in their improved deep-sea apparatus. The apparatus will be understood by reference to figures (Nos. 1 and 2). A is a metal frame, in which B, the thermometer, is pivoted upon an axis, H, but not balanced upon it. C is a screw-

fan attached to a spindle, one end of which works in a socket, D, and at the other end is a screw, E, about half an inch long, and just above it is a small pin, F. On the spindle G, is a sliding stop-piece, against which the pin, F, impinges when the thermometer is adjusted for use. The screw, E, works into the end of the case, B, the length of play to which it is adjusted. The number of turns of the screw entering the case is regulated by means of the pin, F, and stop-piece, G. The thermometer and its case is held in position by the screw, E, and descends into the sea in this position—as Fig. 1; the fan, C, not acting during the descent, because it is checked by the stop, F. When the ascent commences, the fan revolves, raises the screw, E, and releases the thermometer, which then turns over and registers the temperature at that spot. When the hauling-up has caused the thermometer to turn over, a spring at K forces the pin, L, into a slot in the case B, and clamps it (as seen in Fig. 2) until it is received on board, so that no change of position can occur during the ascent from any cause. The case, B, is cut open to expose the scale of the thermometer, and also perforated to allow free passage of the water.

SOME PRIMITIVE IDEAS ON METEOROLOGY

IN an article published in NATURE (vol. xxv. p. 82) on the opinions of the Chinese Emperor Khang-hi on certain natural phenomena, it will be remembered that the *yang* and *yin*, or the male and female principles of Chinese philosophy, played a conspicuous part. Japan, it is well known, adopted at a very early period in its history the law, polity, science, philosophy, and writing of the Chinese, and with them the *yang* and *yin*; and it may not be uninteresting to our readers to see how the doctrine of these dual forces, mutually repellent as well as attractive, has been employed to explain the facts of meteorology. A recent issue of the *Japan Gazette* newspaper of Yokohama contains the translation of a work written in 1821 by a certain Arai Yoshinari, called the "*Ten-chi-ji*;" or, Ideas about Heaven and Earth." The heavens, the writer says, are very high, the earth is very thick; we cannot ascend to the one or go down into the other; consequently man was unable for many generations to comprehend the phenomena of either; but now the opinions of all philosophers on this subject are based on the action and reaction of the male and female, the active and passive principles of nature upon each other. The rain is a changed form of the male, and the vapour under the earth of the female principle. When the male principle sinks into the earth it pursues the female. The earth is the mother of all things and the heaven is the air or wind where the sun, the moon, and the stars hang shining. There are two kinds of air—the heaven-air and the earth-air. The motion of the heavens is contrary to that of running water. The heavens move from east to west, while water runs from west to east. In some districts, indeed, water in the earth runs towards the north, but meets the earth-air which obstructs its flow, causes much agitation, and finally its complete evaporation from the surface of the earth. The vapour thus formed ascends and becomes clouds, which are again turned into rain by the action of the wind. The water has periods of increase and decrease according to the male and female seasons; thus in summer, which is the male season, water increases, while in winter, or the female season, it diminishes. Again, the earth-air is changed into rain when it moves from east to west; and therefore, previous to rain, we see a white vapour in the morning ascending in the east. "This is a clear proof of the earth's growing hot." For the same reason mountains become somewhat darker just before rain.

Thunder is produced by the mingling of the male and female principles. Sounds are often heard in the earth in the neighbourhood of volcanoes. This is due to the