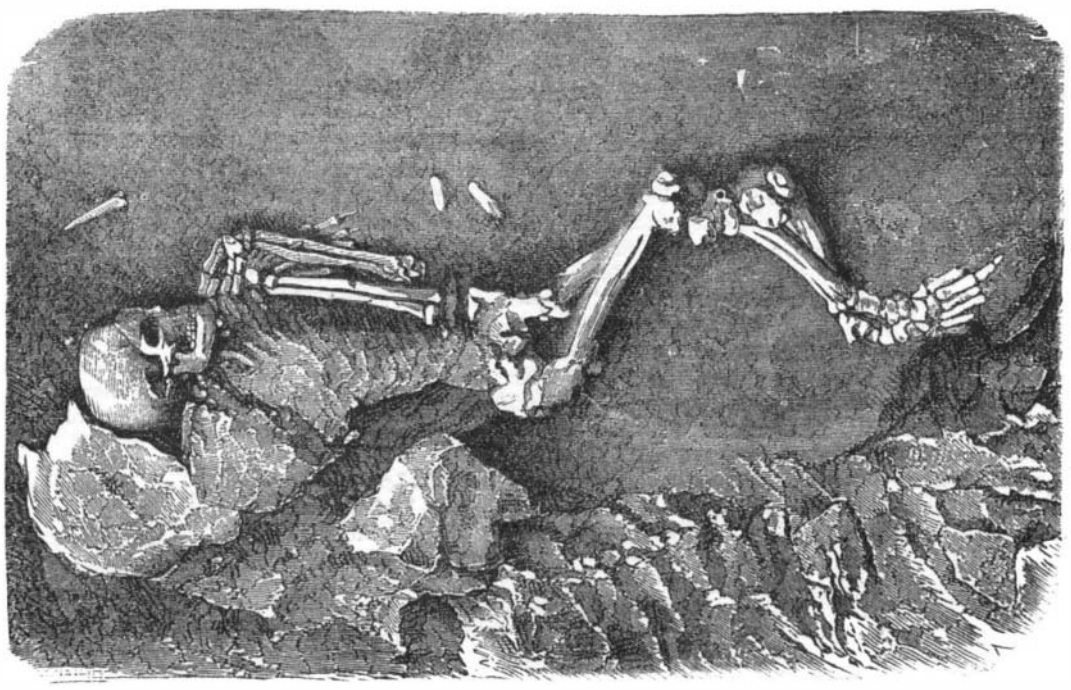
THE FOSSIL MAN OF MENTONE.

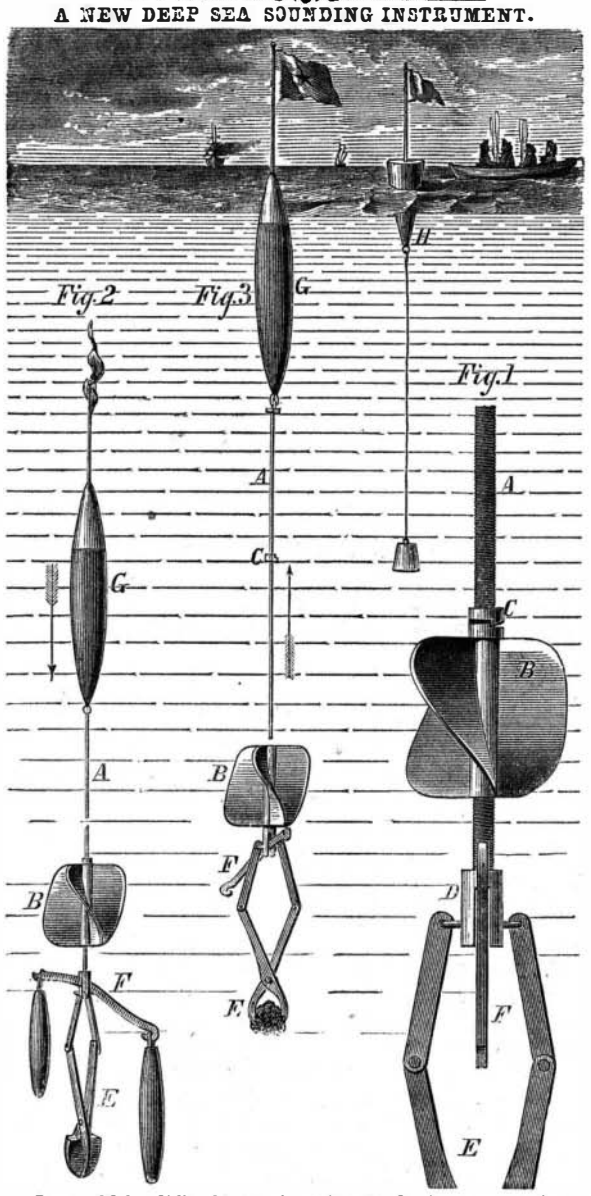
The discovery of a human skeleton in one of the grottoes of Mentone, a village on the south coast of France, near Nice, has produced for some time past no small excitement in the scientific world. The cave in which it reposed is hollowed in the garumnian limestone immediately below the nummulitic tertiary deposit so well developed in the vicinity. Some large imbedded rocks, probably post-eocene, gave rise to the natural excavation.

It appears, from the recent investigations of M. Rivière, that, at the upper portions of the caverns examined, remains of instruments and tools were found, belonging to the prehistoric epoch which immediately preceded, in the west of Europe, the appearance of metals. Below the surface, beds abound, remains of human industry indicating a civilization even more primitive than the antiquity assigned them by the superposed masses. In this locality was discovered, at a depth of 21 feet, the famous human skeleton depicted in our engraving. The earth was evidently in virgin condition, and hence the remains clearly belonged to the geological and palæontological age of its surrounding deposit. While, however, the fauna discovered in connection with the human relics indicate a very ancient palæontological epoch, the bone and stone instruments, and especially the necklace found on the skeleton, seem to point to a more recent period. The presence of cave bears and hyenas, the *rhinoceros tichorinus*, and *bos primogenius*, evidently relate to the most ancient quarternary epoch, the age of the bear; while, on the other hand, the abundance of remains of deer of various species and of small hight (chamois especially), the fact of the multiplicity of bone tools, needles, chisels, and a *baton* of command, together with the peculiar necklace which closely resembles that found on the fossil man of Cra-Magno, lead to the conclusion that the series of objects belongs to an age posterior to that of the bear, namely, to that of the reindeer. It is believed, however, says Dr. Garrigou, in *La Nature*, that the original owner of the skeleton existed during the latter age, and was buried in a cave formerly inhabited by men of the preceding epoch.



THE FOSSIL MAN OF MENTONE.

A NEW DEEP SEA SOUNDING INSTRUMENT.



It would be difficult, we imagine, to devise a more simple and inexpensive apparatus for deep sea sounding than that represented in the accompanying illustration. There is no intricate mechanism, no series of wheels or dials requiring careful adjustment, and not even a line; nothing, in fact, essentially more than a piece of metal wire, screw-threaded from end to end, and a fan working thereon rotated by the motion of the machine. The screw is cut to a certain pitch, so that the descent of the apparatus must be through a fathom of water to cause the fan to make one revolution. The further the instrument travels down, the higher the fan will climb up the rod. As soon as bottom is reached, and the machine begins its ascent, the fan (of course acted upon in a different direction) runs down the screw, but a messenger on the latter, pushed up by the fan, remains at and indicates the highest limit attained. It is only then necessary to pick up the apparatus when it comes to the surface and observe the distance that the messenger has been carried up, and the depth in fathoms is infallibly told.

Compared with the intricate systems for sounding carried by such vessels as the Challenger, and in other marine exploring expeditions, the present device is a marvel of simplicity and cheapness. It can be made on board, with the tools ordinarily found in the engineer's department of a steamer, or, at most, with one special instrument for cutting the screw thread upon the wire. The remainder of the apparatus is a block of wood or other light material for a lifting buoy, the grapplers which bring up specimens of the bottom, and a watch buoy. By noting the time of descent, together with the bearing and distance of the watch buoy from the point at which the machine rises to the surface, the bearing will show the difference of direction between surface and submarine currents, and the distance, the velocity. Thus, in the single instrument, is afforded a means of determining depth, character of bottom, and set and rapidity of currents.

The credit of this very ingenious invention is due to Captain Truman Hotchkiss, of Stratford, Conn., a gentleman of large maritime experience, to whom we are indebted for the substance of the detailed description which follows.

From Fig. 1 the particulars of the device will be understood. A is the screw threaded rod, made of brass or steel, and B is the fan, boxed and tapped to travel thereon. C is the messenger, traveling on the screw and fitting the upper end of the fan by a coupling so as to be moved by the fan only up the screw. At D is a socket screwed to the lower end of the rod, A, which carries the grapnel, E, the latter hanging to the bent end of a bolt which passes through the socket. This bolt also serves as a pivot for an unevenly balanced lever, F, Fig. 2, which passes through a slot at right angles to the plane of the grapnel. The upper end of rod, A, hooks in an eye on the bottom of the lifting buoy, G. H is the watch buoy, provided with anchor and flag.

Fig. 2 shows the machine descending and also the mode of adjusting it. It will be observed that the arms of the lever, F, differ considerably in size, and that they are provided with hooked ends, the curve on the arm on the right turning downward, and that on the left arm in the opposite direction. By this means the two weights represented are supported, one weight, the heavier, extending down to about the level of the bottom of the grapnel. The latter of course remains closed, as is evident from its form. The fan and messenger are then carried down to the bottom of the rod; and thus adjusted, the machine is let go, the watch buoy being previously carried to the place of descent. The time is then noted and a careful watch kept for the return of the apparatus. In descending, the rotating fan climbs up the screw, carrying the messenger with it; and the weights, overcoming the lifting power of the buoy, continue dragging the machine down until bottom is reached. At that moment the lower weight is lifted from its hook and drops clear, the smaller weight overbalances the lever and also falls off, and the jaws of the grapnel, opening against the resisting soil, grab a portion of the bottom. The lifting buoy now easily carries up the apparatus freed from the weights; and soon reaching the surface (Fig. 3), is easily recognized by the flag which it carries, blowing out clear.

The machine is then recovered, and the position of the messenger noted, as already described. As there are thirty-eight turns of the screw thread per inch of rod, it is only necessary to measure the distance in inches between the messenger and socket, D (*minus* the length of the fan), and to multiply the result by thirty-eight, when the depth in fathoms is at once known.

The machine may be made of any desired size; and in cases where the grapnel is likely to catch in seaweed or other obstruction, the power of the lifting buoy can be easily increased to tear away the hold.

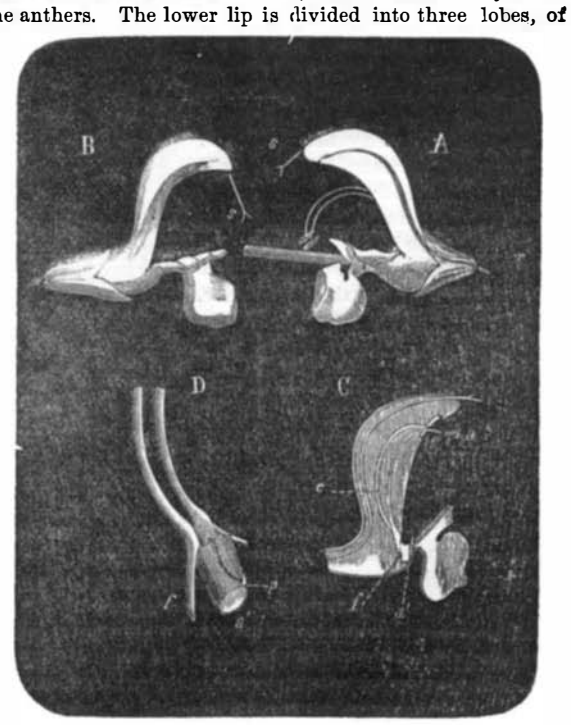
THE FECUNDATION OF FLOWERS BY INSECTS.

Among the numerous discoveries with which vegetable physiology has of late been enriched, none is more interesting or more curious than the part taken by insects in the development of flowers. The fact seems hardly credible, moreover, that, after all the theories which have been invented to explain the passage of the pollen to the stigma of the same flower (to explain which even the intervention of water, which is highly destructible to the pollen of terrestrial plants has been mentioned as possible), in the majority of cases the floral organs are so disposed as to absolutely prevent this contact, and that the pollen needs to be deposited on the stigma of a sister flower or even on a blossom belonging to a separate stalk.

Generally, when the pollen of a flower, through some means, accomplishes its self-fecundation, the result is a deleterious action upon the stigma, and the plant remains barren, as, for example, in many species of the genus *oncidium*. The aquatic plants, of which the pollen is transported by water, are few in number, while the pollen and stigma exhibit a peculiar disposition. With others (*coniferæ, gramineæ*), in some cases the wind carries the pollen, but the flowers are insignificant, destitute of nectar and of odor, and their pollen is in such great abundance that it has given rise to a fable, in certain countries, of a rain of sulphur.

Our attention, at present, however, will be directed to the flowers the pollen of which is carried by insects involuntarily from one blossom to another. Such flowers seem to appeal to the insect to enter their open leaves by exhibiting the brightest colors, and most beautiful and varied forms, besides secreting quantities of the nectar upon which their visitor subsists. Nothing can be more wonderful than the thousands of different shapes of corolla, of stamens, and of pistils; and yet all are arranged so as not only to cover the insect, in spite of himself, with pollen, but, at the same time, to separate completely the pollen and stigma of the same flower. Often the mechanical disposition of the various parts of the blossom and their play at the moment of the entrance of the intruder is extremely complicated, as Darwin has demonstrated in the case of many of the *orchidaceæ*; but there are other flowers of which the construction is easily understood and which are equally ingenious and surprising. One of the simplest is the sage (*salvia pratensis*) a very common plant of the *labiatæ*, or mint family, characterized by the existence of two stamens instead of four, portions of the flowers of which our illustration (extracted from the pages of *La Nature*) represents.

The corolla, A B, is deeply divided into two lips; the upper, which corresponds to two divisions of the corolla, turns backward in the form of an arch, and incloses the style and the anthers. The lower lip is divided into three lobes, of



which the middle one is large and concave; while those on the sides are smaller and roll from within outwards. The tube of the corolla is somewhat crooked at the base, and this crook or depression contains the secreted nectar. Of the peculiar form of the stamens, a clear idea will be gained