drawn the pair of large boot stockings, the shoes, trowsers, and the canvass frock. (A deep canvass pocket, in front, tied round the waist, would be found very useful to contain the knife, and any small tools that might be necessary to take down.) A knife should always accompany the Diver, to cut away any ropes etc etc with which he might become entangled.

The HELMET is next to be put on and secured, and the PUMP set in motion, and to be continued at a regular steady pace until the Helmet is taken off. A soft laid rope, about 3 inch of the best quality, called the signal line, with an eye spliced in one end, and a mouse worked to prevent it jamming too tight round the body, is to be passed under the Diver's feet, and upwards to his arm-pits, and is then to be tied close to the neck of the Helmet by the piece of line that hangs for that purpose under the centre eye-glass, which is to prevent the signal line from slipping down the body, and to raise the head of the Diver, if he should fall down while under water. The signal line must be more than twice the depth of water: it is therefore advisable to have it a good length - say thirty or forty fathoms. The pipe is then to be strapped nearly in front, either on the right or left side, round the waist by the leathern girdle.

When the Diver is thus prepared, the weights are to be put on, by two men lifting them up as high as possible on the chest, and between the shoulders, the heaviest weight being the front weight, the line, attached to the left side of it must be rove through the two thimbles on the left side of the Helmet and then through the two thimbles of the back weight, keeping it under the pipe, and next to the back; (if it is placed outside, its weight will collapse the pipe, and prevent the air from passing into the Helmet;) the line must then pass through the two thimbles on the right side of the Helmet, and then through the thimble on the right side of the front weight; the slack line should be all taken in, to keep the weights well up, and a slip half hitch with a bow, taken with the end round its own part, just over the last named thimble, the signal line will then lead up fair, under the middle part of the front weight, and between the weight line on the left hand side of it, and the thimble on the right. It will be found, by reeving the weight line carefully as directed, that if the Diver should be placed in difficulty, and in an instant require to discharge his weights to ascend; by taking hold of the end of the weight line and pulling out the loop or bow, the weights would immediately fall off clear of him, without danger of entanglement ...

Other sections in the pamphlet included Care and Management of the Air Pump, A Code of Signals for the Use of Deane's Diving Apparatus, and Signals to be made on the Pipe.

It is remarkable that the Royal Navy still use several of these signals to this day and include one pull for "I am OK/are you OK?" translated from John Deane's "Avast". Constant pulling meaning "Emergency" translates from "Pull me up quickly". The section on the diving helmet and dress represents the most detailed account of the helmet and dress available to date and deserves special examination.

Most of the above components are self explanatory except perhaps for the "green belt". It is believed that this was the wicker belt to prevent the chest weights pressing uncomfortably against the body of the diver. There is reference to such a belt later on, and another observer reported "They also protect some parts of their body with a basket-work enclosure covered with rough flannel". However it drew adverse comment from a naval person during the transitional period[2]:

At depths over 12 fathoms, divers were made to wear a ridiculous wicker-work contrivance known as a crinoline, which, in some muddlehead way, was supposed to keep pressure off the vital organs. Girt with this apparatus the diver progressed along the bottom in the manner of a rocking horse ...

The actual vital organs were not identified. The term "crinoline" is derived from an ancient accessory of women's clothing. It was a light framework worn beneath a dress to hold it out in a distended position. In the context of the diving dress, it served the similar though more practical function of holding the suit and weights away from the diver's chest. This was intended to give the diver more freedom to breathe properly. A little further insight into this strange garment was found in Siebe Gorman & Co's "Manual for Divers" dated about 1882:

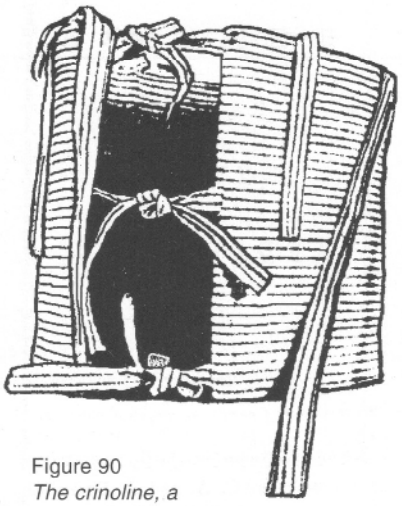

Figure 90
The crinoline, a covered, wicker belt that was worn by early divers around the chest and abdomen, under the diving suit. Also referred to as the "shackle" and "green belt".
US Navy Handbook for Seaman Gunners, Manual for Divers, 1905. Leon Lyons, USA.

The CRINOLINE or SHACKLE should be used for deep water, and at any time, at the Diver's option, it is placed around the body and tied in front of the stomach; being supported by braces it affords protection to the stomach, and enables the diver to breathe more freely.

In more modern helmets, the arrangement for the weights to be supported off the chest by the "breastpiece" or corselet has rendered this requirement redundant. It proved almost impossible to find an illustration of this obscure item of the early diver's clothing. The only known illustration was eventually found in the "1905 US Navy Handbook for Seaman Gunners, Manual for Divers" (Fig 90).

Without the clear instructions such as those which John wrote, the use of the equipment would be inherently dangerous. This revelation came almost too late for a London tradesman when his curiosity led him to try out a diving dress in his warehouse in 1836[3]: