



J. N. Nielsen.
(1877–1932).

JENS NICOLAI NIELSEN was born 4. Nov. 1877 in Klim in Northern Jutland. He passed exam. art. in 1896 and took the degree of B. Sc. (cand. mag.) in physics at the University of Copenhagen in 1902. The international oceanographic researches began in the same year, and NIELSEN was appointed assistant hydrographer

under the Danish commission for the study of the sea, and took part as hydrographer in the voyages of the Danish research steamer "Thor" to the Faroes and Iceland in 1903, 1904 and 1905.

In 1905, 1906 and 1907 he also took part in voyages to the Eastern Atlantic Ocean. He was with the brig "Tjalfe" in 1908 and 1909 on her research voyage to the west coast of Greenland. In the summer of 1910 he was a member of Professor JOHS. SCHMIDT's second expedition to the Mediterranean with the "Thor". He entered the service of the Danish Meteorological Institute in 1910, and in 1923 he was appointed State meteorologist and chief of the weather office. He was a member of Professor JOHS. SCHMIDT's first "Dana" expedition in the Atlantic ocean in 1921, and also of the second in 1928.

These many voyages in waters of widely varying character gave him practice in observation and scientific experience. He was born with powers of combination and a critical sense, and he had ample occasion to practice the latter in the literary studies which preceded his published works.

These published works are not very many. With the exception of a single treatise which deals with a drift-bottle experiment and a single theoretical dissertation about the rise of temperature in downward-moving water all NIELSEN's works have their origin in the observation of distribution of temperature and salinity in suitable sections, and in comparison of different sections. His first works are from Iceland and the Faroes. Here he specially studied the anticyclonic current which moves round Iceland, and the Irminger current extending into Denmark Strait. These researches were continued during the voyages of the "Tjalfe". On these cruises he studied the waters round Greenland, especially the East Greenland Polar Current, which bends round the south point of Greenland and on the west coast gradually changes to a relatively warm coastal current. South of Greenland he also found convection currents, arising from cooling of the surface in winter and extending down to the bottom, thus forming the cold bottom water of the North Atlantic.

NIELSEN became aware of a Mediterranean problem in 1905, when the Danish research voyages, on account of the eel researches, were extended farther south. He described in a treatise in 1907 a

warm and salt water-stratum found at a depth of about 1000 m. near Ireland, which he supposed was originally water which had streamed out from the Mediterranean through the Straits of Gibraltar. This current had already been observed by CARPENTER. NIELSEN began to work in earnest on the hydrography of the Mediterranean when, after the "Thor's" first Mediterranean voyage 1908—09, he received the hydrographic material to work up. He wrote a short article about this in the Danish "Geografisk Tidsskrift", which led to his becoming a member of the "Thor's" summer expedition to the Mediterranean in 1909. After he had come home he wrote his chief work, "Hydrography of the Mediterranean and Adjacent Waters" (1912). This work is the result of exact observation; NIELSEN writes, for instance, that in the Mediterranean a tenth of a degree has about the same importance in indicating changes as a whole degree in the Atlantic. The work shows his great hydrographic experience and his clear, sober thinking. We shall not attempt to give an account of this work, which has attracted so much attention by the many new and surprising results it contains; let it suffice to say that NIELSEN gives a survey of the movements of the waters in *the whole* of the Mediterranean from east to west, from bottom to surface. He makes it clear that the principal factor in the hydrography of the Mediterranean is evaporation from the surface. The evaporation uses up water and leaves the surface water more saline; herein lies the cause of the inward current through the Straits of Gibraltar and of other horizontal currents, the increased salinity setting convection currents in motion, which again cause horizontal water-movements. NIELSEN has made himself a fine monument in his treatment of the hydrography of the Mediterranean. The work has been a good deal commented on, and it still sets pens moving.

There remains a short treatise on the "Dana's" voyage in the Atlantic Ocean in 1921. It deals with the Gulf Stream (Geogr. Tidsskrift, Copenh. 1925), and describes the stream's formation and the water strata which form it. He maintains that the warm and salt water which washes the coast of North-West Europe is undoubtedly derived mainly from the Antilles Current, the water masses of which keep outside the Antilles Islands and farther north run on the right-hand side of the Florida current. And by this

latter name the Gulf Stream proper, coming from the Gulf of Mexico and running through the Florida straits, ought to be designated.

NIELSEN was an independent and original personality. He was probably best known to those who had sailed with him, and he will not be forgotten by them. Sometimes it would happen that he sat long silent and listened to the conversation, and then suddenly he would utter a short remark, which at times could have the double effect of causing hearty laughter and at the same time disclosing a new truth. His opinions had firm foundations; they were the result of thinking and not of feeling, and therefore he was a judicious adviser, even if his words at times could be somewhat caustic. Perhaps people who did not know him well feared him a little; but to old acquaintances he was an understanding and honest friend. His death (on 15. Aug. 1932) meant the loss of a highly gifted scientist, a gentle mind, and a valuable personality.

OVE PAULSEN.