gas as in air. Grapes are capable of absorbing or losing water when kept in a moist medium or in a dry medium. As maturation advances, the acids diminish and the sugar increases. The mechanism of maturation is stated to be this:—Acids and glucose are formed in the plant, and the sap conducts them to the grape; the acids are consumed in it, while the sugar is concentrated. When the maturation is very advanced, the sugar is consumed in its turn.

RIPENING OF GRAPES AFTER REMOVAL FROM THE VINE.—In the *Gazetta chimica Italiana*, vii. 517, some experiments by M. Pollacci are described, in which he finds that the process of ripening continues for a certain time after the grape has been removed from the parent plant. The bunches of fruit removed were, as far as possible, equally divided, and the quantity of glucose and acid determined in the freshly-gathered grapes, as also in portions kept in the shade for some ten or twelve days. In all the portions which had been kept, the glucose had increased, whilst the amount of acid had diminished, showing that a certain amount of ripening action had taken place; this action, however, ceases after a time, the ripening never attaining full maturity.

USE OF METHYL CHLORIDE FOR THE PRODUCTION OF LOW TEMPERATURES.—At a recent meeting of the French Physical Society, M. Vincent called attention to the use of chloride of methyl for production of low temperatures. It may be extracted in large quantities and cheaply from the products of beet-root molasses. It is normally gaseous, and liquefies under about four atmospheres pressure, when it may be conveniently carried about in iron or copper vessels, a store of cold at easy disposal. On opening a cock the liquid will flow out and give a bath at $-23°$, its boiling temperature under atmospheric pressure. If the vaporisation be intensified by a current of air, the temperature descends to about $-55°$. M. Vincent has arranged an apparatus for utilisation of such cold. He incloses two or three kilogrammes of liquid chloride of methyl in a double wall enveloping a bath of alcohol or chloride of calcium in solution, and protected exteriorly by an isolating layer of cork raspings. To obtain low temperatures, a cock is opened to allow communication of the double envelope (through a caoutchouc tube) with an air-pump.

FORMATION OF HYDROCARBONS BY THE ACTION OF WATER ON MANGANESE IRON ALLOYS CONTAINING CARBON.—Cloëz found that by acting on Spiegeleisen with dilute sulphuric acid bodies resembling the petroleum hydrocarbons were formed. On trying the action of pure water at 100° no results were obtained, while at 250° with super-heated steam, a certain action was perceived which increased with the temperature, being completed at a dark red. The hydrocarbons, however, were again decomposed. The same author has since tested a series of manganese alloys, and finds that the best results are obtained by means of one containing roughly Mn 85, Fe 6, C 3·5, Graphite 4, Si 1·1. Small portions of this, treated with boiling water, decomposed the latter with the evolution of hydrogen, oily drops being simultaneously formed, and the gas burning with a luminous flame showed the presence of hydrocarbons. Another alloy of nearly similar composition gave the following results: the flask contained slightly alkaline water with a mixture of iron and manganese oxides in suspension; the liquid hydrocarbons in the condenser were similar to those previously found, the gases also burning with luminous flames. He has thus shown that water alone at the proper temperature decomposes manganese iron alloys containing carbon.

ACTION OF BORON FLUORIDE ON CERTAIN CLASSES OF ORGANIC COMPOUNDS.—This body has been found by Fr. Landolph to combine in definite proportions, equivalent for equivalent, with certain classes of organic bodies such as aldehydes, acetones, and also with camphor. For his experiments the particular substances examined were ethylic, valeric, and benzylic aldehydes, ordinary acetone, euodic aldehyde (oil of rue), and ordinary camphor. In all these cases considerable disengagement of heat was manifested in the combinations of the several substances. By the action of the fluoride on acetone two products are obtained, the one boiling between 130°-140°, this being, according to the author, the most definite; another compound, however, exists which boils at a temperature of 160°-170°. The first is a fluid of a syrupy consistence and yellow-green colour; it burns readily, giving a green flame, and is entirely decomposed by water. The compound, with ethylic aldehyde, ethylen fluoboride, $C_2H_3BFl_2$, undergoes decomposition when treated with water, into a body with a peculiar ethereal odour, the composition of which, the author thinks, may probably be C_2H_5Fl.

GEOGRAPHICAL NOTES

IN the just-published number of the Royal Geographical Society's *Proceedings* we find some useful remarks by Mr. F. Galton, on what has recently been done and what is further required for the advancement of geographical teaching. First and foremost, he says, is the publication of that excellent book by Prof. Huxley, "Physiography," which, starting from the simplest elements, led students steadily on to the higher conception of physical geography and the most recent discoveries in it. Next, Sir Walter Trevelyan, a former Secretary of the Society, had felt so much the necessity of a better form of text-book for geographical teaching that he had placed a handsome sum at the disposal of the Council to procure, if they were able to do so, the compilation of a really good county geography, to serve as an example for other similar works to be used in elementary schools. Turning to what is required in the future, Mr. Galton mentions that they have received a letter from a master of one of the great public schools, urging them to plan a system of diagrams explanatory of different physical features. His own opinion, Mr. Galton says, is that what is most urgently needed is some simple and well-methodised system of experiments, suited to illustrate lectures on the main features of physical geography. He has no doubt that an extension of the methods of illustrating the facts of physical geography—as used by Prof. Tyndall and Dr. Carpenter—on a small scale and on a lecture-room table, is perfectly feasible. Thus, as every thunder-shower shows in the streets the phenomena of erosion and deposition, he has no doubt that, on a lecture-table, with a can to supply water, and with a certain quantity of sand, gravel, and clay, all the main phenomena of river-action, such as the sifting of materials, the stratification of deposits, and the formation of deltas, might be successfully shown.

MEANS have recently been found, we learn from the *South Australian Register*, for still further increasing the usefulness of the Hon. (now Sir) T. Elder's camels on the far northern stations with which he is connected. The experiment of using them for draught purposes has been tried, and recently two teams of six camels drew loads of 5¼ tons each from Beltana to Port Augusta. The plan adopted is to yoke the animals together something after the manner in which bullocks are coupled, and one man only is required to manage each team. It has been found that the camels thrive well in the northern country; the number originally imported several years ago was about 100, of which the greater part died, as the land, by its comparative richness, presented too great a contrast to their native soil; there are now, however, about 400 of their descendants at Lake Hope, Umberatana, Beltana, and other stations in the far north, and the race seems to be thoroughly acclimatised. The camels have already been