the more southern divisions of the Northern flora, so we may infer that towards the close of the Tertiary epoch the continuous circumpolar land was covered with a vegetation also largely composed of identical plants but adapted to a warmer climate. As the climate became less warm there would commence a migration southwards, which would result in the modified descendants of these plants being now blended with the vegetation of Central Europe and the United States. As the glacial period gradually advanced, "the tropical plants and animals will have retreated from both sides towards the equator, followed in the rear by the temperate productions, and these by the arctic."[1] When the climate of the earth again ameliorated, the migration took place in the reverse direction, and in this way mountain ranges became the havens of refuge of fragments of the original arctic floras which were exterminated on the lowlands. Even the equatorial region ceased to be a barrier during the glacial period, and to migration at that time must be attributed the survival of arctic forms in the south temperate zone. The southern migration of the Arctic flora does not appear to have taken place in one continuous wave. Thus, as Bentham points out,[2] "many facts showed separate communications between the north and each of the three chains of the Pyrenees, the Alps, and the Himalayas, whilst these three gave little evidence of any lateral communication of their respective alpine vegetations."

The fact that the migration southwards and remigration northwards of the Arctic flora took place along parallels of longitude, accounts for some of its existing peculiarities. Hooker explains in this way the comparative poverty of the Greenland flora.[3]

"If it be granted that the polar area was once occupied by the Scandinavian flora, and that the cold of the glacial epoch did drive this vegetation southwards, it is evident that the Greenland individuals, from being confined to a peninsula, would be exposed to very different conditions to those of the great continents. In Greenland many species would, as it were, be driven into the sea, that is exterminated; and the survivors would be confined to the southern portion of the peninsula, and not there being brought into competition with other types, there could be no struggle for life amongst their progeny, and consequently no selection of better adapted varieties. On the return of heat, these survivors would simply travel northwards unaccompanied by the plants of any other country.

"In Arctic America and Asia, on the other hand, where there was a free southern extension and dilatation of land for the same Scandinavian plants to occupy, these would multiply enormously in individuals, branching off into varieties and sub-species, and occupy a larger area the further south they were driven; and none need be altogether lost in the southern migration over plains, though many would in the struggle that ensued when they reached the mountains of those continents and were brought into competition with the alpine plants, which the same cold had caused to descend to the plains. Hence, on the return of warmth, many more Scandinavian species would return to Arctic America and Asia than survived in Greenland; some would be changed in form, because only the favoured varieties could have survived the struggle; some of the alpine Siberian and Rocky Mountain species would accompany them to the arctic zone; while many arctic species would ascend those mountains, accompanying the alpine species in their reascent."

The Arctic-alpine flora is obviously in its present condition a composite one. Portions of the Northern flora, probably originally very distinctly characterized, became adapted to the peculiar physical conditions of high mountain ranges and of the extreme north. The gradual deterioration of the climate brought the alpine flora, to the lowlands and the arctic flora southwards till they intermingled. When they again returned to their original territories they were so far changed that each gave the other some new members, while both had experienced many losses.

[1] Darwin, *Origin of Species*, 4th ed. p. 447.
[2] Presidential address, 1869, p. 21.
[3] Hooker. *l. c.* p. 254.

A. de Candolle has very ingeniously applied the general principles laid down above to the detailed explanation of the distribution of the flora of the Alps themselves. The following is a brief summary of his conclusions :—[4]

The valleys and groups of mountains which have at present a maximum of rare species and the most varied flora belong to districts on which the glaciers disappeared earliest. On the other hand, where the duration of snows and glaciers has been most prolonged, the existing flora is poor. From a variety of causes which A. de Candolle enumerates, it seems probable that the southern and eastern glaciers of the Alps were of smaller extent than the northern, and would consequently be the soonest to retreat. We have consequently the curious fact that some of the most ancient fragments of the alpine flora are now only to be found on the *southern* slopes of the Alps. This is the case with species of *Primula*, *Pedicularis*, and *Oxytropis*, which exist neither in the interior of Switzerland, nor in the north of Europe. But it is easy to see that, like the other members of this flora, they were driven south during the glacial period, returning as the mountains reappeared from underneath their snowy covering, while on the northern side they were in great measure exterminated. A. de Candolle points out as a fact in further confirmation that the Alpine species of *Campanula*, peculiar to Mont Cenis and the Simplon and neighbouring valleys, are not related to the Arctic species, but find their nearest allies in Greece, Asia Minor, and the Himalaya.

A further indication of the great antiquity of the Arctic-alpine flora is afforded by the fact of its absence in the comparatively modern volcanic mountains of France. "The Monts d'Or and Cantal, at an elevation of 6000 feet, offer scarcely any of those alpine and sub-alpine plants which abound at the same or lower elevations in the Pyrenees on the one side, and in the Alps on the other, as well as in the British and Scandinavian mountains to the north."[5] Hooker, however, points out that the absence of the alpine-arctic flora in Auvergne may be due to severe glaciation rather than to its absence (see *Nature*, Nov. 11, 1875, pp. 31, 32).

2. The *Intermediate* or *Temperate* flora is best described in the words of Bentham as

"A mongrel vegetation of mixed origin, including a large proportion of species of the most extended geographical range, with a very few local ones, and those chiefly in the extreme west. The majority, whether trees, shrubs, or herbs, are plants of comparatively rapid growth, very prolific, endowed with great facilities for dispersion, and constitutions capable of adapting themselves to a great variety of physical and climatological conditions. They are great travellers, and soon take possession of any district left denuded by the abandonment of cultivation. To the great majority of them no primeval antiquity can be ascribed in Central or Western Europe;[6] they appear to have come from the east, a considerable number perhaps from Western Asia, where their types appear to be more varied, but many also must have made half the tour of the globe.[7] Large American genera have sent out offsets into Eastern Asia, which gradually diminishing in number of species, and sometimes slightly modifying their character, have spread over the whole of Asia, and invaded almost every part of Europe. These plants are, moreover, generally continuous, that is, interrupted only by intervals which under present condition they have means of crossing; and they are abundant in individuals, ascending in latitude and elevation, or descending to the south, until checked in their career by competing species, better enabled to endure the increasing rigour or the searching drought of the respective climates. Many of them will even assume slight modifications suited to their exceptional circumstances, and it is then as difficult to separate them from the genuine northern or southern floras as in many cases to give plausible grounds for establishing the precise origin of individual species."[7]

The peat deposits of Denmark tell an unmistakable tale of the gradual advance of successive waves of vegetation from the south-east. The Scotch fir was once abundant within

[4] These are given in greater fulness in *Nature*, April 27, 1876, p. 516.
[5] Bentham, *Nat. Hist. Rev.*, 1864, p. 370.
[6] Martins, however, considers that many of the plants of the existing south of Europe flora are of great antiquity in their present situations; thus the Oleander (*Nerium Oleander*) has been found in deposits from the Eocene upwards (*Mém. de l'Acad. d. Sc. de Montpellier*, ix. p. 95).
[7] *Nat. Hist. Rev.*, 1864, pp. 370, 371

the Roman period in the Danish islands, but is now extinct; it was succeeded by the sessile-fruited oak, to be in turn supplanted by the pedunculated form of the same tree, associated with the alder, birch, and hazel. The oak is now almost supplanted by the beech.[1] According to Areschoug, the original post-glacial flora of Scandinavia has retreated to the north, and is probably still retreating, while the flora of central and south Scandinavia consists of "an eastern and north-eastern vegetation, which spread into Europe after the glacial period and before the beech tree had invaded Sweden, with the admixture of more southern species, which, with the beech, have since penetrated into Sweden through Denmark."[2] The beech and the chestnut occur in Japan, and, as far as Europe is concerned, there is good reason to regard their origin as Eastern.

As already pointed out, the American element in the European flora suffered severely during the glacial period, and has never since recovered itself. Japan, however, appeared to have been a great centre of preservation, and hence the numerous points of contact which its flora presents with that of the North American continent. In the New World itself, the continuity of the pre-glacial and post-glacial temperate floras has been better preserved. The following passage from an address of Asa Gray's may be quoted as giving its history in a concise form :—

He "considered that the present vegetation or its proximate ancestry must have occupied the arctic and sub-arctic regions in Pliocene times, and that it had been gradually pushed southward as the temperature lowered and the glaciation advanced, even beyond its present habitation; that plants of the same stock and kindred probably ranging round the arctic zone as the present arctic species do, made their forced migration southwards upon widely different longitudes, and receded more or less as the climate grew warmer; that the general difference of climate which marks the eastern and western sides of the continents,—the one extreme, the other mean,—was doubtless even then established, so that the same species and the same sorts of species would be likely to secure and retain foothold in the similar climates of Japan and the Atlantic United States, but not in intermediate regions of different distribution of heat and moisture; so that different species of the same genus, as in *Torreya*, or different genera of the same group as redwood, *Taxodium* and *Glyptostrobus*, or different associations of forest-trees, might establish themselves each in the region best suited to the particular requirements, while they would fail to do so in any other."[3]

The west of Europe possesses the remains of a local and probably more ancient flora of very great interest, characterized by Gorse, and allied shrubby *Leguminosæ*, Heaths, Lobelias, Sibthorpias, &c. These are closely checked in any tendency towards eastern dispersion by the severity of the winter climate away from the ameliorating influence of the sea. The probability of a southern extra-tropical connection of this peculiar element in the Northern flora will be adverted to hereafter.

The flora of the British Isles is in many respects interesting; it is in its main features an extension of the Germanic area of the temperate flora with the presence of the western element above alluded to distinctly marked on the south-western coasts. *Eriocaulon septangulare* is an anomalous constituent, being limited to Ireland and a few islets on the western side of North Britain, and being otherwise an American and not a European species.[4] Its presence can hardly be explained except by the agency of migratory birds.

3. The *Mediterraneo-Caucasian* flora, like the Arctic-alpine, contrasts in the most marked way with the temperate.

"By far the richest and most diversified in species [it comprises six-sevenths of the European flora], it is also remarkable for the great variations centering round individual types, as well as for the very restricted areas occupied by a number of the most marked species; the limits are not to be accounted for by any physical peculiarities we are acquainted with, nor perhaps to be otherwise explained than by a supposition of very great antiquity."

Eastward of the Caucasus this remarkable flora dies away, reaching its eastern limit in Scinde, and the temperate flora of Asia is only separated from the tropical by the Himalayas. Southwards its progress is arrested by the arid zone formed by the African and Arabian deserts.[5] As in the case of the Arctic flora, traces still exist of its former southern extension under the influence of a colder terrestrial climate. *Adenocarpus*, a characteristic Mediterranean genus, is represented by an identical species on Kilima Njaro, near the equator, and on the Cameroons mountains, 2000 miles distant on the opposite and western side of the African continent.[6]

II. THE SOUTHERN FLORA.—The Southern flora exhibits relations much more complex than those presented by the Northern. Instead of extending over large continental areas it is now dismembered into isolated groups scattered over the southern hemisphere, and in both the New and Old World sending northern extensions across the equator.

Five types may be briefly described, the definition of all but the first being taken from Bentham :—[7]

1. The *Antarctic-alpine* flora is the complement of the *Arctic-alpine*. It consists mainly of some widely distributed northern genera such as *Carex*, *Poa*, *Ranunculus*, &c., with alpine types of strictly south temperate genera characteristic of the respective localities. Hooker describes it as possessing "decided Australian representatives in *Centrolepideæ* and *Stylidieæ*, commencing in Fuegia, the Falklands, and Lord Auckland's and Campbell's groups, reappearing in the Alps of New Zealand, Tasmania, and Australia, and disappearing under the equator, on the Alps of Borneo."[8]

2. The *Australian* flora is "almost endemic, showing some slight connection with the New Zealand, and a few remains of former ramifications northward to some parts of the Indian Archipelago, a very few species, perhaps of modern introduction, extending to China and Japan." Bentham[9] conclusively dismisses Unger's theory of the former extension of the Australian flora into Europe in Eocene times.

3. The *Andine* flora, characterized by a large number of distinct genera, *Fuchsia*, *Gaultheria*, *Calceolaria*, ranges more or less along the whole chain, "penetrating far northwards in Western America, throwing off a few branches into Eastern Asia, and at its southern extremity crossing over to New Zealand, and in smaller numbers to Tasmania, and the mountains of Victoria."[10]

4. The *Mexico-Californian* flora is "represented at great distances by closely allied species of small distinct genera —in Mexico and California, in the Argentine states, and in S. Africa or Australia."[11]

5. The *S. African* flora is "perhaps the richest known in proportion to its extent, and remarkably varied within its narrow limits." Its connection with other floras is very slight. That with Australia, alluded to at the commencement, does not extend beyond groups of the highest order (in the *Proteaceæ* not merely the species but the genera

[1] Lyell, *Antiquity of Man*, p. 9.
[2] Bentham, *l. c.* p. 22.
[3] *Darwiniana*, pp. 224, 225.
[4] Watson, *Compendium*, p. 31.

[5] Bentham, *Nat. Hist. Rev.*, 1864, p. 373.
[6] Hooker in *Journ. Linn. Soc. Bot.*, xiv. p. 144.
[7] Presidential address, 1869, pp. 24, 25.
[8] *Introductory Essay to the Flora of Tasmania*, p. 104.
[9] Presidential address, 1870, pp. 12–67.
[10] On the extra-tropical southern connection between America and the Old World as illustrated by the *Compositæ*, see Bentham in *Journ. Linn. Soc.*, xiii. p. 561.
[11] See also Asa Gray, *Darwiniana*, pp. 213, 219.

have become geographical); and, as mentioned above, there are a few scattered species, representing the South African flora, in extra-tropical South America. There are, however, two offshoots in a northern direction. The remarkable West European flora, already referred to, possesses species of *Erica*, shrubby *Leguminosæ*, *Lobelia*, *Gladiolus*, &c., "more nearly added to corresponding Cape species than they are to each other." The other extension is to Eastern Africa. The sub-alpine vegetation of Kilima Njaro is distinctly South African, and Hooker suggests "the probability of the South African flora being represented all along the highlands of Eastern Africa, from Natal to Abyssinia; and further, seeing that most of the South African plants found in the Cameroons are also natives of Abyssinia, it would appear probable that the migration of these to the Cameroons was by and through Abyssinia."[1] The further suggestion that this may have been the path travelled by the West European extension of the South African flora is sufficiently obvious.

The amount of agreement amongst these scattered fragments of a great flora points necessarily to a state of things when the lands they now occupy were at one time or other in more or less of intimate connection. The amount of differentiation between the floras, and the fact that agreement has to be sought in groups of high rather than of small rank, points equally to the fact that such connections must have been far from recent.[2] The detailed study of separate groups leads by another path to the same result, and, as a good instance of the new phase into which taxonomic botany is entering in the light of the study of geographical distribution, reference may be particularly made to Bentham's important investigation into the vast history and migrations of the *Campanulaceæ*.[3]

III. THE TROPICAL FLORA.—This is still perhaps too imperfectly known to admit of any very plausible generalization. It obviously presents three great subdivisions.

1. The *Indo-Malayan* extends from the Himalayas to north-east Australia and Japan. In the latter country it meets the northern temperate flora, from which in India it is sharply divided by the Himalayas.

2. The *American* is still a perfect mine of unexplored botanical wealth. Bentham remarks—"No general comparison of Asiatic and American tropical vegetation can therefore be made without immense labour of detail. As far as we know, however, the resemblance between them is only in some of the races of a higher grade, natural orders and comprehensive genera; the smaller genera and species, and many even of the higher ones, are totally different; or if a few species are identical, they are generally, if woody or arborescent such as *Entada*, *Gyrocarpus*, &c., wholly or partially maritime, and may have traversed the ocean during its present configuration, or if herbaceous widely, spread weeds still more likely to be spread all round the tropics under existing conditions."[4] There are, however, some extraordinary points of connection between the tropical floras of the Old and New Worlds, to which there is at present scarcely any clue. Thus *Ternstrœmia emarginata*, endemic to Ceylon, so closely resembles the Brazilian *Ternstrœmia cuneifolia* as to be barely distinguishable.

3. The *African* tropical flora is probably the most imperfectly known of any. Bentham considers it as of great antiquity, and as having preserved large numbers of persistent types from which races "have widely diverged in Asia or America, or in both." He further remarks that "as our knowledge of the vegetation of tropical Africa has increased, we have discovered a greater number of Asiatic types; but still there are, even in the interior, a certain number of American ones, offering a problem the solution of which has scarcely been attempted."[5]

In *Compositæ* American genera are represented in east tropical Africa, and Bentham is led on various grounds to regard this as the principal area of preservation of the most ancient tropical flora of the Old World.[6] A well-marked eastern element in the African tropical flora is generally accepted. Madagascar, whose flora bears the marks of long isolation, contains Malayan and even Australian types; and it is a problem worth future inquiry whether the connection between the floras of tropical America and Africa may not have taken place south of the tropics, and by similar (though more northern) paths to those which once united the scattered members of the great Southern flora.

As might have been expected, during the Tertiary period the tropical flora extended much beyond its present limits. De Saporta, who has studied with great caution the fossil flora of the gypseous beds (Eocene) of Aix in Provence, arrives at the following conclusions:[7]—The principal families were such as characterize tropical vegetation, especially Indian—*Ebenaceæ*, *Anacardiaceæ*, *Sapindaceæ*, *Sterculiaceæ*, *Leguminosæ*. The affinities of the ancient vegetation of Aix in respect of generic types, general facies, and composition with that of India and the Indian archipelago, China, the Philippines, and Japan at the present day, are in perfect accordance with the theory that these regions formed the shores of our ancient nummulitic sea, extending from Morocco to Japan, and entirely comprised in the tropical zone of the Eocene world, which extended to the 55th parallel. Besides its relation to South-Eastern Asia, the Aix flora exhibits, according to De Saporta, a strong affinity with that of Africa, lying between Abyssinia and the Cape, of which, however, it must be confessed, but little is as yet known.

Here this outline of the present state of a most important and rapidly developing branch of biological science must be concluded. The writer has availed himself very freely of the kind permission of Mr Bentham—perhaps the greatest living master of the subject—to make use of his scattered but invaluable papers, not scrupling to borrow from them all that seemed most important and suggestive, but has generally thought it fairer both to the subject and to Mr Bentham to do so in his own words. For two heads of the subject it must suffice merely to give references. On the remarkable phenomena of insular floras, the reader should consult Sir Joseph Hooker's well-known lecture delivered before the British Association in 1866, and printed in the *Gardener's Chronicle* for January 1867, or, in default of this, the summary given in Lyell's *Principles of Geology*, 10th ed., vol. ii. pp. 417–421. On the means of dispersion of plants, reference may also be made to Lyell's work already quoted, vol. ii. pp. 386–400; Darwin's *Origin of Species*, 4th ed., pp. 425–442; Bentham, Presidential Address, 1869, pp. 7, 8. (W. T. T. D.)

[1] *Cf.* also Darwin, *Origin of Species*, 4th ed. p. 474.
[2] *Journ. Linn. Soc. Bot.*, xiv. p. 145.
[3] *Journ. Linn. Soc. Bot.*, xv. p. 11. Presidential address, 1869, p. 24.
[4] *Journ. Linn. Soc. Bot.*, xiii. 545.
[5] Bentham, *l. c.* p. 24.
[6] *Annales des Sciences Naturelles*, Sept. 1, 1872.

DITHMARSCHEN, or DITMARSH, in the oldest form of the name *Thiatmaresgaho*, Dietmar's Gau, a territory between the Eider and the Elbe, forming the western part of the old duchy of Holstein, and now included in the Prussian province of Schleswig-Holstein. It was originally colonized mainly from Friesland and Saxony,—the Frisian kindred of the Vogdemans settling on the coast and giving rise to the two marks of Norderstrand and Süderstrand, and the Saxon kindred of the Woldersmen settling inland and forming the two marks of Norderhamme and Süderhamme. The district was subjugated and Christianized by Charlemagne in 804, and ranked as a separate *Gau*, included perhaps in the countship of Strade, or *Comitatus utriusque ripæ*. From the same century, according to one opinion, or from the year 1180, when the countship was incorporated with their see, according to another, the archbishops of Bremen claimed supremacy over the land; but the inhabitants, who had developed and consolidated a systematic organism for self-government, made obstinate resistance, and rather attached themselves to the bishop of Schleswig. The Danish king Björn Svendsön succeeded in defeating them; and Ditmarsken, to use the Scandinavian form of the name, continued part of the Danish dominions till the disastrous battle of Bornhöved in 1227, when its former independence was regained. The claims of the archbishop of Bremen were now so far recognized that he exercised the royal rights of *Heerbann* and *Blutbann*,[1] enjoyed the consequent emoluments, and was represented first by a single *advocatus*, or *vogt*, and afterwards by one for each of the five Döffts, or marks, into which the land was divided after the establishment of Meldorp. The community was governed by a landrath of forty-eight elective consuls, or twelve from each of the four marks; and even in the 14th century the power of the episcopal vogts was so slight that a chronicler of that date, quoted by Maurer, says, *De Ditmarschen leven sunder Heren und Hovedt unde dohn wadt se willen*, "the Ditmarschen live without lord and head, and do what they will." In 1319 and in 1404 they succeeded in defeating the invasions of the Holstein nobles; and though in 1474 the land was nominally incorporated with the duchy by the emperor Frederick III., the attempt of the Danish king Hans and the duke of Gottorp to enforce the decree in 1500 resulted only in their complete rout in the marshes of the Dussend-Düwels-Warf. During the early part of the century which began with such prestige for Ditmarsh, it was the scene of violent internal conflict in regard to the religious questions of the time; and, thus weakened, it was obliged in 1559 to submit to partition among its three conquerors—King Frederick II. of Denmark and Dukes John and Adolphus. A new division took place on Duke John's death in 1581, by which Frederick obtained South Ditmarsh, with its chief town of Meldorp, and Adolphus obtained North Ditmarsh, with its chief town of Heide; and this arrangement continued till 1773, when all the Gottorp possessions were incorporated with the Danish crown.

See Dahlmann's edition of Neocorus, *Chronik von Dithmarsen*, Kiel, 1827, and *Geschichte Dänemarks*, 1840–44; Michelsen, *Urkundenbuch zur Geschichte des Landes Dithmarschen*, 1834, *Sammlung alldithmarscher Rechtsquellen*, 1842, and *Dithmarschen im Verhältnis zum Bremischen Erzstift*; C. L. von Maurer, *Einleitung zur Geschichte der Mark-, Hof-, Dorf-, und Stadt-Verfassung*, 1854; Nitzsch, *Das alte Dithmarschen*, 1862; Kolster, *Geschichte Dithmarschens, nach F. R. Dahlmanns Vorlesungen*, 1873.

DITTON, HUMPHRY (1675–1715), an eminent mathematician, was born at Salisbury, May 29, 1675. In compliance with the wishes of his father rather than by his own inclination he entered on the study of theology, and was for some years a dissenting minister at Tunbridge, where he married. On the death of his father, however, he was induced to relinquish the clerical profession; and at the persuasion of Whiston and Dr Harris he devoted himself to the more congenial study of mathematics. Through the influence of Sir Isaac Newton, he was elected mathematical master in Christ's Hospital, where he continued till his death in 1715.

Ditton was the author of the following treatises:—*Of the Tangents of Curves*, &c., *Phil. Trans.* vol. xxiii.; *A Treatise on Spherical Catoptrics*, published in the *Phil. Trans.* for 1705, from which it was copied and reprinted in the *Acta Eruditorum*, 1707, and also in the Memoirs of the Academy of Sciences at Paris; *General Laws of Nature and Motion*, 8vo, 1705, a work which is commended by Wolfius as illustrating and rendering easy the writings of Galileo and Huyghens, and the *Principia* of Newton; *An Institution of Fluxions, containing the First Principles, Operations, and Applications of that admirable method, as invented by Sir Isaac Newton*, 8vo, 1706. In 1709 he published the *Synopsis Algebraica* of John Alexander, with many additions and corrections. In his *Treatise on Perspective*, published in 1712, he explained the mathematical principles of that art; and anticipated the method afterwards elaborated by Dr Brook Taylor. In 1714 Ditton published his *Discourse on the Resurrection of Jesus Christ*; and *The New Law of Fluids, or a Discourse concerning the Ascent of Liquids in exact Geometrical Figures, between two nearly contiguous Surfaces*. To this was annexed a tract to demonstrate the impossibility of thinking or perception being the result of any combination of the parts of matter and motion,—a subject much agitated about that time. There was also added an advertisement from him and Whiston concerning a method for discovering the longitude, which it seems they had published about half a year before. Although the method had been approved by Sir Isaac Newton before being presented to the Board of Longitude, and successfully practised in finding the longitude between Paris and Vienna, the board determined against it. This disappointment, aggravated as it was by certain unquotable lines written by Dean Swift, affected Ditton's health to such a degree that he died in the following year

DIU, an island and small seaport on the south coast of the Káthiáwár peninsula, in the province of Guzerat, in India. The Portuguese obtained possession of the island in 1515, and have held it ever since. Diu town is situated at the eastern extremity of the island, in 20° 42′ N. lat and 71° 0′ E. long. The anchorage is fairly protected from the sea, but the depth of water is only 3 to 4 fathoms, and is said to be decreasing. The channel between the island of Diu and the mainland is navigable only by fishing boats and small craft. The town is well fortified on the old system, being surrounded by a wall with towers at regular intervals.

DIURETICS (from διά, through, and οὐρέω, to pass urine) are remedies which, under certain conditions, produce an increased flow of urine. Their mode of action is various. Some, as turpentine and cantharides, are absorbed into the blood, are carried to the secretory organs (the kidneys), and stimulate them directly, causing an increased flow of blood to them; others act as stimulants through the nervous system. A second class act in congested conditions of the kidneys by diminishing the congestion; this is supposed to be one of the modes of action of digitalis. Another class, such as the saline diuretics, are effectual by virtue of their osmotic action. A fourth class are diuretic by increasing the blood pressure within the vessels in general, and the Malpighian tufts in particular,—some, as digitalis, by increasing the strength of the heart's contractions, and others, as water, by increasing the amount of fluid circulating in the vessels. Some remedies, as mercury, although not diuretic themselves, when prescribed along with those which have this action, increase their effect. The same remedy may act in more than one way, *e.g.*, alcohol, besides stimulating the secretory organs directly, is a stimulant to the circulation, and thus increases the pressure within the vessels. It is stated above that remedies have a diuretic action under "certain conditions." These relate to—1st, the state of the kidneys themselves; 2d, the condition of other organs; 3d, the surroundings of

[1] That is, the right of claiming military service, and the right of bringing capital offenders to justice.