to be very tense the posterior pillar may be divided; but we are warned by Mr. Tait that atrophy of the soft palate is likely to follow this operation, an outcome which is to be regretted. This condition I have noticed in one of my own cases.

Many cases require two and three operations, but we should not be discouraged. Contrast a good result with the frequent necessity of changing the obturator and the care required in looking after it.

Fig. 1388 shows the little pinhole opening (in some cases larger), which may often be closed by the persistent use of some caustic, such as nitrate of silver or nitric acid.

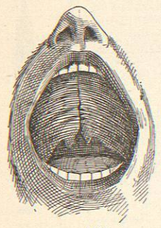

FIG. 1388.

Training the voice after the operation is of great importance as regards the final result. Great patience is required, and we must not expect improvement to follow immediately. A year, or even a longer time, may be required. With children I have had greater trouble in teaching the pronunciation of ch, as in church, chicken, etc., than that of any other sound. Dr. Henry J. Bigelow, of Boston, has in a very able manner presented the following views as to teaching the children to talk after the operation has been performed. He says: "Some years since I devised a short series of exercises for a patient I had operated upon. It begins with the only consonant which a patient can usually best articulate, namely, 't' in '*tar*,' and gradually leads to the rest, constantly referred to the acquired '*t*' as a point of departure. The great difficulty in pronouncing correctly with a cleft palate is in distinguishing the nasals from the mutes; thus, p and b from m; pab or bab from mam; t and d from n; tat from nan; k and g (hard) from ng. '*Tar*' is well pronounced by most beginners with an obturator. When the beginner can pronounce 'stark' and 'car' he has the key to most of what here follows. The above words should be practised carefully; not 'start' and 'tar,' but 'stark' and 'car,' and should be spoken loudly, or, as the elocutionists say, 'exploded.'

1.	tar	artar	kar	arkgar	kar
2.	kar	arkar	arkgar	kgar	gar
3.	kar	arkar	arkdar	kdar	dar
4.	kar	arkar	arkpar	kpar	par
5.	kar	arkar	arkbar	kbar	bar
6.	kar	arkar	arklar	klar	lar
7.	kar	arkar	arksar	ksar	sar

Practise all the above with the following vowels:

8. o as in coke.

Thus, instead of kar, akar, etc., ko-oko-oklo-klo-lo.

9. a (long) as in cake.
10. i as in kite.
11. e as in keep.
12. u as in suit.

13.	kar	arkar	arngar	arkar	arngar	kar	ngar
14.	tar	artar	arnar	artar	arnar	tar	nar
15.	par	arpar	armar	arpar	armar	par	mar
						bar	mar
						dar	mar
						sar	rar"[2]

Practise reading loudly from a book:

In the case of children beyond twelve years of age, and particularly with adults, I would perform the operation for closing cleft palate, if for nothing more than to afford comfort in eating.

Regarding the treatment of the acquired form of cleft, I should, in all cases of traumatic origin, operate by forming the periosteal flaps. In cases in which constitutional syphilis is present, I should hesitate somewhat, believing that in the majority of these cases the obturator does best. *A. Vander Veer.*

[1] British and Foreign Medico-Chirurgical Review, July, 1870.
[2] From Boston Med. and Surg. Journal, February 7th, 1884.

CLEVELAND.—The second city of size and importance in Ohio, situated on the south shore of Lake Erie at the mouth of the Cuyahoga River. It is a large and handsome city of several hundred thousand inhabitants, and from the abundance of its shade trees is called the "Forest City." The climate is indicated by the accompanying table:

CLIMATE OF CLEVELAND, OHIO—LATITUDE, 41° 30′; LONGITUDE, 81° 42′. PERIOD OF OBSERVATIONS, THIRTEEN YEARS.

Data.	January.	July.	Year.
Temperature (Fahr.)—			
Average or normal	26.8°	71.9°	48.9°
Average daily range	13.7	14.9	
Mean of warmest	32.8	79	
Mean of coldest	19.1	64.1	
Highest or maximum	70	96	
Lowest or minimum	−17	49.6	
Humidity—			
Average relative	77.9%	70.1%	71.2%
Precipitation—			
Average in inches	2.50	4.21	38.40
Wind—			
Prevailing direction	S.W.	N.	S.E.
Average hourly velocity in miles	10.7	7.3	9.3
Weather—			
Average number clear days	2.8	9.6	83
Average number fair days	8.4	15.7	141.8
Average number fair and clear days	11.2	25.3	224.8

Edward O. Otis.

CLIFTON SPRINGS.—Ontario County, New York.

POST-OFFICE.—Clifton Springs. Hotel and sanitarium.

ACCESS.—Viâ Auburn branch of the New York Central and by the Lehigh Valley railroads.

This resort is located in one of the most healthful parts of the State, midway between the villages of Geneva and Canandaigua. The location is about six hundred and seventeen feet above the sea level, and the surrounding country is somewhat hilly. An average summer temperature of about 75° to 85° F. is the rule. The springs are very numerous, but only five are in use at present. Dr. Henry Foster, the superintendent, sends us the following analysis by the late Prof. J. R. Chilton:

SULPHUR SPRING.

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Calcium carbonate	9.68
Magnesium carbonate	13.12
Sodium sulphate	7.76
Calcium sulphate	69.20
Magnesium sulphate	16.48
Sodium chloride	9.28
Calcium chloride	4.08
Magnesium chloride	4.08
Organic matter	Trace.
Total	133.68

Sulphureted hydrogen gas, present.
Carbonic acid gas, present.

This water is quite similar to that of the Greenbrier White Sulphur Springs of West Virginia. It is used to supply the Clifton Springs Sanitarium, the important feature of this resort. A staff of eight physicians (six gentlemen and two ladies) is maintained at the sanitarium and it is believed that the facilities for treating certain classes of diseases are unsurpassed anywhere. All varieties of baths are here to be found, as well as all the modern appliances and methods of using electricity. The use of massage, the Swedish movement, and the various forms of gymnastics also receive due attention. The sanitarium building, with its recently constructed annex, affords accommodation for four hundred and fifty persons. All modern contrivances for the comfort and health of the guests are provided—elevators, an electric bell service, a solarium, roof garden, etc. The surrounding park, containing more than fifty acres, beautified by well-kept lawns, spacious pavilions, attractive walks, miniature lakes, shady groves, flowers, etc., provides a healthful and restful retreat. The house is kept open for guests all the year, but the greater number visit the place during the summer months. *James K. Crook.*

CLIMATE.—The word climate comes from the Greek word *κλιμα*, an inclination or slope. It was applied anciently to signify the supposed horizontal obliquity of the surface of the earth from the equator to the pole. The earth was divided by the earlier astronomers and geographers into parallel climates, or zones, that differed successively from each other from the equator to the pole by some arbitrary increment in the length of the midsummer days. Indirectly these zones, or climates, marked out more or less accurately the gradual changes in the characteristics of the weather dependent upon decreasing insolation. In modern usage the word climate has reference to the weather of a place or region, and to the factors that cause the weather to differ in different regions. It is difficult to give a rigid definition of the modern acceptation of the word climate, because different meanings have been given to it by different writers, just as different conceptions of its scope or the intents and purposes of its users have dictated. As used subsequently in this article the word climate is applied to the totality of those physical conditions of the atmosphere of a place or region that recur with more or less uniformity with the recurrence of the natural periods of time. Or, in other words, climate is the totality of the weather of a place or region as experienced there in the course of a long period of consecutive years. Weather itself is the instantaneous condition of the atmosphere with respect to its physical state. In a more extended sense weather is the continuity of the successive variations in the physical conditions of the atmosphere. In this sense, it is common to speak of the weather at noon, sunset, or any other time of the day, or of the weather of the whole day, or of the month, or of the year, and even of several years in succession.

The investigation of the causes that produce the weather and of their laws and principles of operation constitutes the branch of science known as meteorology. The further study of these causes to find out and classify those that are operative in producing the more or less periodical recurrences of the weather constitutes what is known as climatology, or the science of climate. Climatology is dependent upon meteorology, and meteorology in turn derives benefit from the advancement of climatology. For descriptive purposes, climate is usually stated in terms that have reference or regard to the temperature of the air, its humidity, motion, density, transparency, and electrification; also to the amount of precipitation, that is, the quantity of rain, snow, hail, sleet, dew, and frost, that occurs, and to its distribution: these items are referred to as the climatic elements. The conditions that cause variations in the intensity of the climatic elements constitute the climatic factors; the principal ones of which are latitude, altitude, distribution of land and water, mountain ranges, ocean currents, prevailing winds, amount and distribution of rainfall, nature of the soil and its drainage and vegetation, and the slope of the surface. These factors may be classified as fixed or natural factors, and dependent or resultant factors. The fixed factors are altitude, latitude, distribution of land and water, mountain ranges and slope of the surface, and nature of the soil; the dependent or resultant factors are the ocean currents, the prevailing winds, precipitation, soil drainage, and vegetation. As different regions and places on the earth's surface differ with respect to one or more of these factors, the climates of such regions necessarily differ more or less from each other. To describe exactly the climates of the different regions of the earth would be a task too great to be undertaken, but fortunately such exactness is not necessary to a practical comprehension of the climatic possibilities of any given spot on the globe.

Certain important principles are learned from meteorology that go far toward enabling us to anticipate from the geographical position and natural features of a place relative to some other place, whose climate is known, what the climate of the former is likely to be. Primarily, climate results from the effects on the earth's surface of the incident solar energy and its unequal distribution, which follows of necessity from the shape of the earth and its motions and its inclination with respect to the ecliptic. Other disturbing causes are introduced by the heterogeneous nature of the earth's surface. All of these causes have been alluded to as the climatic elements and factors. Their actual operations and effects will become plainer if we first consider a hypothetic earth and sun. From the laws of general physics, we can predict with as much certainty as we can predict the future course of the earth in its orbit what would be the climatic conditions upon every part of our imaginary globe. Starting with a homogeneous, smooth spheroid, either land or water, having an atmosphere of the same composition as our actual atmosphere, situated with respect to its sun as the actual earth is to its sun, only having no axial revolution, the sun revolving round the earth instead, let us consider what kind of climate it would have. The amount of solar energy received on each and every meridian by our hypothetic earth would be distributed from the equator to the poles in a ratio that would vary approximately as the cosine of the latitude (this is also true with regard to the actual earth, and is an important fact to bear in mind): the temperature of its atmosphere would therefore decrease gradually poleward on each side of the equator and every place on the same parallel of latitude would have the same temperature.

As the temperature controls the amount of moisture in the atmosphere, places on the same parallels would have the same degree of atmospheric humidity. The same conditions of equality would be true, also, of the winds and their velocities. In short, the climate of a given spot would be determined by its latitude, and all places in the same latitude would have the same climate. The general circulation of the atmosphere would be simple. The warmer air of the equatorial zone would expand, rise to a higher vertical level, and flow off toward the cooler poleward regions. The air of these regions, under the difference of pressure that would result from the accumulation of the overflowing air from the equator, would flow equatorward. This polar air, however, arriving in the equatorial zone would itself be warmed, expanded, and would overflow in like manner; and so a circulation would be established with surface currents from the poles to the equator, and upper currents from the equator to the poles, the direction of both currents being along the meridians. This would be the general tendency of the circulation. The actual circulation would be somewhat more involved. From the form of the surface of the spheroid over which this circulation would take place, the poleward moving air would be banked up more or less in its course by the lateral diminution of the area over which it was moving. The principle of the conservation of areas enables us to locate this banking up of the poleward moving air in the regions of latitudes 30°. The result that would follow would be an increase in atmospheric pressure in these regions with surface outflows on each side, those on the equatorial sides toward the equator, as in the first hypothetic instance; those on the polar side toward the pole, and opposite and antagonistic to the flow in the first suppositious instance. The result of this opposite poleward flow would be to overcome for a considerable distance the surface currents from the poles; the latter would be lifted from the surface and become middle currents. This underrunning and lifting of the polar currents would obtain to about the polar circles. The final result would be surface winds on the equatorial sides of latitude 30° toward the