

Ashland Mineral Waters

Their Constituents and Medicinal Uses

See similar of page 82 to 107 as appearing in August, 1914, issue of The Mineral Resources of Oregon, by Alexander S. Winchell, Professor of Geology for the University of Wisconsin.

Mineral springs are numerous in the vicinity of Ashland. Some of them have been productive commercially for many years, and some are improved so as to be used for bathing, for the establishment of health resorts and for medicinal purposes. But they are not used as much as they deserve to be nor as much as they will be in the future. The mineral spring waters are varied in composition and resultant qualities, and their merits are not widely known. Some of them are natural "soda water" charged with their own carbonic acid gas. Others are rich in chlorine and should be used for other purposes. A single instance is known of a water rich in iodine and bromine.

The mineral water containing much iodine was collected by Harry Silver in the Ashland district in August, 1909. Unfortunately no complete analysis is available, but it is known that this sample contained very much sodium chloride (NaCl) and calcium chloride (CaCl₂), and according to L. A. Bundy, assistant chemist at the Oregon Agricultural College, it also contained 476 parts of iodine and 107 parts of bromine per million parts of water. Mineral waters from deep wells in southern Michigan contain much more bromine than found in this water from southern Oregon, but the writer knows of no water containing as much iodine as that from the Ashland district. In view of the fact that most of the iodine used in this country is now obtained as a by-product of the purification of soda niter imported from South America, and that it is worth about two dollars a pound in New York City, it seems desirable to investigate carefully the possibility of producing iodine in southern Oregon on a commercial scale.

Analyses of mineral waters are stated in many different ways. The salts dissolved in the water are probably more or less divided

1 Geol. Survey Mich., Vol. V, Pl. 2, pp. 46 and 82.

MINERAL WATERS

into their acidic and basic constituents and just what salts are present it is often impossible to state with certainty. Therefore such analyses should not be expressed merely in terms of the compounds supposed to exist in solution, but primarily in terms of the substances obtained by the analytical chemist. It may be useful for some purposes to supplement this by a statement of the salts which are believed to be present.

Furthermore, the results of chemical analysis are stated in parts per million of water, or in grains per U. S. gallon, or in percent of total salts, the total amount of dissolved salts being added in parts per million. For purposes of ready comparison and since each is useful for certain purposes the following analytical results are expressed in these three ways.

MINERAL RESOURCES OF OREGON

COMPOSITION OF "OLD LITHIA" SPRING WATER

[Analysis by Smith, Emery & Co., San Francisco. Sample taken by A. L. Emery, 1914.]

Constituent	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Chlorine	Cl	2422.00	140.48	22.06
Bromine	Br	2.00	.12	.02
Bicarbonic acid radical	HCO ₃	4916.61	285.16	44.81
Nitric acid radical	NO ₃	.27	.01	.00
Nitrous acid radical	NO ₂	.02	.00	.00
Phosphoric acid radical	PO ₄	.32	.02	.00
Arsenic acid radical	AsO ₄	Trace	Trace	Trace
Metaboric acid radical	BO ₂	291.31	16.89	2.66
Sodium	Na	2438.92	141.46	22.23
Potassium	K	91.40	5.39	.83
Lithium	Li	7.90	.46	.07
Ammonium	NH ₄	6.04	.35	.05
Calcium	Ca	354.46	20.57	3.23
Barium	Ba	1.70	.10	.02
Magnesium	Mg	338.63	19.64	3.06
Iron	Fe	10.20	.59	.09
Manganese oxide	Mn ₂ O ₃	.70	.04	.00
Alumina	Al ₂ O ₃	1.30	.07	.01
Silica	SiO ₂	87.82	5.09	.81
Salinity, parts per million		10971.60	636.35	100.00

Theoretical combination	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Sodium chloride	NaCl	3908.27	226.68	35.02
Lithium chloride	LiCl	47.92	2.78	.44
Ammonium chloride	NH ₄ Cl	17.93	1.04	.16
Potassium bromide	KBr	2.98	.17	.03
Sodium bicarbonate	NaHCO ₃	2716.96	167.75	24.79
Potassium bicarbonate	KHCO ₃	231.48	13.43	2.11
Calcium bicarbonate	Ca(HCO ₃) ₂	1432.15	83.07	13.06
Barium bicarbonate	Ba(HCO ₃) ₂	3.30	.19	.03
Magnesium bicarbonate	Mg(HCO ₃) ₂	2637.20	118.16	18.57
Iron bicarbonate	Fe(HCO ₃) ₂	32.48	1.88	.30
Sodium nitrate	NaNO ₃	.37	.02	.00
Calcium phosphate	Ca ₃ (PO ₄) ₂	.55	.03	.00
Sodium metaborate	NaBO ₂	447.16	25.94	4.08
Manganese oxide	Mn ₂ O ₃	.70	.04	.01
Alumina	Al ₂ O ₃	1.30	.07	.01
Silica	SiO ₂	87.82	5.09	.80
Salinity, parts per million		10971.60	636.35	100.00

Ashland and Baden-Baden As Watering Resorts

Mrs. J. E. Hutchinson, Eagle Point, Oregon

The Department of Commerce of the University of Oregon, through its director, Mr. H. B. Miller, has assisted the springs water commission from the start in gathering data of the watering resorts of Europe and America with more particular reference to their systems of organization. In this connection Mr. Miller sent the following very interest-

ing letter from one who has visited the principal European spas and who is familiar as well with the natural possibilities at Ashland. Following is the letter from Mr. Miller transmitting the interesting suggestions from Mrs. Hutchinson: November 30, 1914. Springs Water Commission, Gentlemen: I take special pleas-

MINERAL WATERS

COMPOSITION OF "NEW LITHIA" SPRING WATER

[Analysis by Smith, Emery & Co., San Francisco. Sample taken by A. L. Emery, 1914.]

Constituent	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Chlorine	Cl	2676.60	159.41	21.70
Bromine	Br	2.00	.12	.02
Sulphuric acid radical	SO ₄	Trace	Trace	Trace
Bicarbonic acid radical	HCO ₃	4279.73	247.79	44.64
Nitric acid radical	NO ₃	0.27	.02	.00
Nitrous acid radical	NO ₂	0.02	.00	.00
Phosphoric acid radical	PO ₄	0.21	.01	.00
Arsenic acid radical	AsO ₄	Trace	Trace	Trace
Metaboric acid radical	BO ₂	272.38	15.93	2.87
Sodium	Na	2160.71	127.23	22.93
Potassium	K	172.32	9.51	1.17
Lithium	Li	8.42	.49	.07
Ammonium	NH ₄	5.29	.31	.05
Calcium	Ca	291.92	16.93	3.05
Barium	Ba	1.78	.10	.02
Magnesium	Mg	246.68	14.31	2.58
Iron	Fe	8.60	.50	.09
Manganese oxide	Mn ₂ O ₃	.70	.04	.01
Alumina	Al ₂ O ₃	4.75	.27	.05
Silica	SiO ₂	79.90	4.11	.73
Salinity, parts per million		9566.59	554.85	100.00

Theoretical combination	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Sodium chloride	NaCl	3168.54	183.78	33.12
Potassium chloride	KCl	212.32	12.31	2.22
Lithium chloride	LiCl	51.07	2.96	.53
Ammonium chloride	NH ₄ Cl	15.70	.91	.16
Potassium bromide	KBr	2.98	.17	.03
Sodium bicarbonate	NaHCO ₃	2926.47	169.74	30.59
Calcium bicarbonate	Ca(HCO ₃) ₂	1179.58	68.42	12.33
Barium bicarbonate	Ba(HCO ₃) ₂	3.30	.19	.03
Magnesium bicarbonate	Mg(HCO ₃) ₂	1484.63	86.07	15.52
Iron bicarbonate	Fe(HCO ₃) ₂	27.39	1.59	.29
Sodium nitrate	NaNO ₃	.37	.02	.00
Sodium nitrite	NaNO ₂	.02	.00	.00
Calcium phosphate	Ca ₃ (PO ₄) ₂	.37	.02	.00
Sodium metaborate	NaBO ₂	418.10	24.25	4.39
Manganese oxide	Mn ₂ O ₃	.70	.04	.01
Alumina	Al ₂ O ₃	4.75	.26	.05
Silica	SiO ₂	79.90	4.11	.74
Salinity, parts per million		9566.59	554.86	100.00

MINERAL RESOURCES OF OREGON

COMPOSITION OF SPRING WATER NEAR "ASHLAND LITHIA SPRINGS"

[Analysis by B. Pilkington of Oregon Agricultural College. Sample taken by E. P. Hughes, July 1, 1909.]

Constituent	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Chlorine	Cl	2344.45	135.98	25.62
Bromine	Br	None	None	None
Iodine	I	None	None	None
Sulphuric acid radical	SO ₄	304.81	17.68	3.33
Bicarbonic acid radical	HCO ₃	3515.60	203.90	38.41
Phosphoric acid radical	PO ₄	Trace	Trace	Trace
Boric acid radical	B ₂ O ₃	Trace	Trace	Trace
Sodium	Na	2190.79	127.07	23.93
Potassium	K	266.00	15.43	2.91
Lithium	Li	0.56	.03	.01
Ammonium	NH ₄	1.13	.07	.01
Calcium	Ca	276.64	16.05	3.02
Magnesium	Mg	166.70	9.67	1.82
Iron oxide	Fe ₂ O ₃	10.00	.58	.11
Alumina	Al ₂ O ₃	10.00	.58	.11
Silica	SiO ₂	76.20	4.42	.83
Salinity, parts per million		9152.88	530.88	100.00

Theoretical combination	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Sodium chloride	NaCl	3452.00	200.21	37.71
Potassium chloride	KCl	510.00	29.58	5.57
Lithium chloride	LiCl	3.39	.20	.04
Ammonium chloride	NH ₄ Cl	3.39	.20	.04
Potassium iodide	KI	None	None	None
Potassium bromide	KBr	None	None	None
Sodium sulphate	Na ₂ SO ₄	450.90	26.15	4.93
Sodium bicarbonate	NaHCO ₃	2613.00	145.75	27.45
Calcium bicarbonate	Ca(HCO ₃) ₂	1120.00	64.96	12.24
Magnesium bicarbonate	Mg(HCO ₃) ₂	1014.00	58.81	11.08
Calcium phosphate	Ca ₃ (PO ₄) ₂	Trace	Trace	Trace
Sodium borate	Na ₂ B ₄ O ₇	Trace	Trace	Trace
Iron oxide	Fe ₂ O ₃	10.00	.58	.11
Alumina	Al ₂ O ₃	10.00	.58	.11
Silica	SiO ₂	76.20	4.42	.83
Salinity, parts per million		9152.88	530.86	100.00

ure in inclosing you a very excellent detailed report from one of the good women of your county, in which there are splendid suggestions in relation to your enterprise of establishing a health resort. It occurs to me that this woman would be an excellent adviser in the matter of details of your organization. At any rate, I hope you will go thoroughly into the suggestions which she has to make, as well as to the details which she gives in relation to the health resort in Germany. We are still continuing our efforts to get further information from the health resorts in Europe and I think we shall succeed before long. Will you kindly advise me how matters are progressing and whether there is any further service I can render? Very truly yours, H. B. MILLER, Director of the School of Commerce, University of Oregon.

Follows the letter of Mrs. Hutchinson: Baden-Baden and Homburg. Eagle Point, Ore., Nov. 23, 1914. Mr. H. B. Miller. Dear Sir: In the Medford Mail Tribune of November 12 was an article that deeply interested me regarding Ashland as a watering place. Some thirty years ago I went abroad with my mother to complete my education in foreign languages and singing. During the summer season we visited the beautiful Baden-Baden in the valley of the Lichenthal at the foot of the Voges Mountains. The place was owned at the time I was there by a corporation who administered the laws governing the resort, but not the town of Baden, and was spoken of as the administration. There were many acres laid out as a park, the paths of which were bordered with flowers. It was shaded by fine old trees, and there were many settees along these prom-

MINERAL WATERS

COMPOSITION OF ARTESIAN WELL WATER

[Analysis by Smith, Emery & Co., San Francisco. Sample taken by A. L. Emery, 1914.]

Constituent	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Chlorine	Cl	560.52	32.51	8.08
Bromine	Br	.50	.03	.01
Bicarbonic acid radical	HCO ₃	4299.82	248.87	61.82
Nitric acid radical	NO ₃	.55	.03	.01
Nitrous acid radical	NO ₂	.04	Trace	Trace
Arsenic acid radical	AsO ₄	Trace	Trace	Trace
Metaboric acid radical	BO ₂	66.31	3.85	.96
Sodium	Na	1734.17	100.58	24.99
Potassium	K	28.64	1.66	.41
Lithium	Li	2.18	.13	.03
Ammonium	NH ₄	6.20	.36	.09
Calcium	Ca	144.58	8.38	2.08
Barium	Ba	.46	.03	.01
Magnesium	Mg	58.37	3.38	.83
Manganese	Mn	1.08	.06	.01
Iron	Fe	.32	.02	.00
Alumina	Al ₂ O ₃	1.72	.10	.02
Silica	SiO ₂	24.60	2.01	.50
Oxygen (calculated)	O	9.03	.55	.14
Salinity, parts per million		6940.56	402.56	100.00

Theoretical combination	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Sodium chloride	NaCl	843.32	48.91	12.15
Potassium chloride	KCl	54.15	3.14	.78
Lithium chloride	LiCl	13.22	.77	.19
Ammonium chloride	NH ₄ Cl	18.39	1.07	.27
Potassium bromide	KBr	.75	.04	.01
Sodium bicarbonate	NaHCO ₃	4993.75	289.64	71.95
Calcium bicarbonate	Ca(HCO ₃) ₂	491.56	28.61	7.08
Barium bicarbonate	Ba(HCO ₃) ₂	1.54	.09	.02
Magnesium bicarbonate	Mg(HCO ₃) ₂	351.18	20.57	5.07
Iron bicarbonate	Fe(HCO ₃) ₂	.73	.04	.01
Sodium nitrate	NaNO ₃	.76	.04	.01
Sodium nitrite	NaNO ₂	.66	.00	.00
Calcium phosphate	Ca ₃ (PO ₄) ₂	Trace	Trace	Trace
Sodium metaborate	NaBO ₂	101.36	5.87	1.46
Calcium silicate	CaSiO ₃	66.78	3.87	.96
Manganese oxide	Mn ₂ O ₃	1.50	.09	.02
Alumina	Al ₂ O ₃	1.72	.10	.02
Salinity, parts per million		6940.67	402.55	100.00

MINERAL RESOURCES OF OREGON

COMPOSITION OF "ASHLAND SULPHUR SPRING" WATER

[Analysis by B. Pilkington of Oregon Agricultural College. Sample taken by E. P. Hughes, July 1, 1909.]

Constituent	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Chlorine	Cl	32.72	1.90	12.48
Sulphuric acid radical	SO ₄	10.21	.59	3.89
Silicic acid radical	SiO ₂	54.57	3.17	20.81
Bicarbonic acid radical	HCO ₃	62.60	3.63	23.87
Sodium	Na	26.09	1.51	9.95
Potassium	K	63.07	3.66	24.05
Calcium	Ca	7.12	.41	2.71
Magnesium	Mg	5.87	.34	2.24
Iron oxide	Fe ₂ O ₃	None	None	None
Alumina	Al ₂ O ₃	None	None	None
Salinity, parts per million		262.25	15.21	100.00

Theoretical combination	Chemical symbol	Parts per million of water	Grains per U. S. gallon	Per cent of total salts
Sodium chloride	NaCl	53.91	3.13	20.56
Sodium sulphate	Na ₂ SO ₄	15.11	.88	5.76
Potassium silicate	K ₂ SiO ₃	45.51	2.64	17.35
Calcium silicate	CaSiO ₃	20.66	1.20	7.88
Magnesium silicate	MgSiO ₃	24.44	1.41	9.32
Potassium bicarbonate	KHCO ₃	102.62	5.95	39.13
Iron oxide	Fe ₂ O ₃	None	None	None
Alumina	Al ₂ O ₃	None	None	None
Salinity, parts per million		262.25	15	