taking the injections twice a week, and the case is apparently under control.

CASE 6.—Man, 45 years of age, suffering with a severe and obstinate cephalalgia of syphilitic origin. Mercury and the iodids were pushed to the point of tolerance, with but slight relief. I substituted the intravenous injections, administering bichlorid in half grain doses daily for one week. Relief was immediate. At the end of the week the headache had disappeared entirely. Injections are now given semiweekly.

CASE 7.—Man, 50 years of age, whom I had treated for syphilis twenty years before, reported to me suffering with nocturnal headaches and cerebral symptoms which were decidedly suggestive of an incipient paresis. Lack of concentration and suspicion were noted, and the impairment of his psychic faculties had given rise to considerable alarm on the part of his friends. Gastric irritation and constipation were prominent symptoms, and the evident presence of autointoxication as a complication gave the case a much more favorable aspect than it would otherwise have possessed. The patient absolutely refused to submit to inunctions, and as the stomach proved intolerant of mercury and the iodids I resolved to try the intravenous method. Restoration of the bowel function was first attempted, with gratifying results, the mental symptoms improving markedly within a few days. The headaches, however, continued. Daily intravenous injections of $\frac{1}{4}$ of a grain of bichlorid were then begun. The headaches began to improve within three or four days after beginning the treatment, and within two weeks had entirely disappeared. For six weeks, during which time the patient has been taking no treatment, he has remained apparently well. He will not submit to steady treatment, but has promised to take a course of intravenous injections several times yearly.

CASE 8.—A delicate woman, 28 years of age, without a previous history of syphilis, presented herself with two painful nodes on the right tibia. Nocturnal pains were very severe, necessitating administration of morphin by her previous medical adviser. She had been given small doses of mercury and iodid of potassium without effect; large doses were not tolerated. The patient was put on daily $\frac{1}{8}$ grain intravenous doses of the bichlorid, with the result that within a few days the osteocopic pains ceased and the nodes markedly diminished in size. Slight permanent thickening of the bone at the affected points, however, resulted. This patient is now taking semiweekly intravenous injections of $\frac{1}{8}$ grain of the bichlorid, and is apparently doing well.

CASE 9.—A patient, whom I thoroughly treated for syphilis fifteen years before, reported, complaining of severe pain in the tibiae of some six weeks' duration. The pain was especially marked at night. Examination showed a diffuse periostitis over both tibiae, with slight thickening of the membranes, some edema and exquisite tenderness on pressure. I at once began the intravenous injection of bichlorid, in $\frac{1}{2}$ grain doses. When the patient reported for the second daily injection, he stated that the bone pains had disappeared within three or four hours after the first treatment. Within five days, during which time the intravenous treatment was given daily, the tenderness of the tibiae entirely disappeared. On the sixth day I began interrupting the treatment because of slight ulceration, evidently of mercurial origin, of the mucous membranes of the cheeks. It is now five weeks since the systematic daily treatment was suspended, during which time injections have been given twice weekly, and there has been no recurrence of the pain in the limbs, and no disagreeable effects from the drug.

CASE 10.—Physician, 40 years of age, reported with a chancre of the right finger, with a well-marked typical secondary papular syphilide. Time being an important consideration to the patient, intravenous injections of $\frac{1}{4}$ grain doses of bichlorid were immediately begun. Improvement was manifest within three days, the obscure bone pains with which the patient had been suffering having disappeared, and the eruption having already begun to fade. The intravenous injections were continued for ten days, and, the case being apparently under perfect control, were replaced by inunctions. The patient is still under treatment, and doing well. He has had considerable experience in the management of syphilis, and characterizes the progress of his case as marvelous.

REMARKS.

Granting that the intravenous method of administration of mercury is safe, it would seem to be a very valuable addition to our armamentarium therapeutikum in the treatment of syphilis. I have no hesitancy in saying that it is possible with safety to bring the patient under the full physiologic effect of mercury within forty-eight hours. Argument is unnecessary to prove the value of the treatment in certain emergencies. When carefully given, accidents should be infrequent. I am convinced that where the entire dosage is accurately placed within the lumen of the vein no reaction whatever will occur, providing the tourniquet be moved from the arm after the insertion of the needle into the vein and before the discharge of the mercurial solution has begun. I failed to remove the tourniquet in Case 5, with the result that the portion of the vein between the tourniquet and the needle was practically cauterized, with a resulting phlebitis. This passed away in a few days and left an indurated vessel, which is probably useless for further injection. In Case 10 considerable inflammation resulted on one occasion at the site of the injection. In this case I am confident that I perforated the posterior wall of the vein, thus permitting a few drops of the injected solution to enter the perivascular cellular tissue.

As to the location of the injections, either the median basilic or median cephalic vein in the forearm is an eligible site. The accessibility of these veins, however, varies, and some other site must sometimes be selected. I have found that any prominent and accessible vein will answer the purpose.

A PLEA FOR THE PHYSICAL EXAMINATION
OF ALL SCHOOL CHILDREN.

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Education is compulsory in this country for all children from the ages of 6 to 14. In some states the duration of school life is longer. If the child is not presented by its parents for instruction, the parents must present some good excuse for its non-appearance; and social reasons are not accepted. There are numerous chronic ailments of childhood which absolutely prevent or militate against its receiving any instruction. The more important of these are serious congenital mental defects and defects of the heart or organs of speech. There exist, also, many minor defects, eradicable, provided the parents are informed that such defects exist. The existence of the minor defects, such as squint, near-sightedness, adenoids, enlarged tonsils, bad teeth, nervous twitches, and so on, are often not discovered by the parents, nor is their seriousness realized until the child has for some time been under the influence of school life.

In March, 1905, the medical inspection became a medical examination of school children in New York. Up to January, 1907, 134,000 children had been examined. These examinations consist in examinations for hearing, vision, examination of the nose and mouth for the presence or absence of deformities and the examination of the heart and lungs as much as can be made by loosening the clothing at the neck. No measurements or weights are taken. The findings show an enormous proportion of minor defects and also a considerable proportion of more serious ones.

The percentage of children needing treatment is remarkably high, but need not unnecessarily alarm the people of a large city and make them feel that two-thirds of the children are lame, sick, halt and blind, and that these two-thirds are candidates for institutions for "dependents," "delinquents" and "defectives."

If we leave out (1) enlarged glands, defective vision and breathing, bad teeth, hypertrophied tonsils and postnasal growths, and if it is supposed that (2) malnutrition, defective hearing, cardiac disease, pulmonary disease, deformities of the spine, chest and extremities, bad mentality and chorea each existed in a different child, this reduces our percentage of defects to 19 per cent.

In the first group it is fair to assume that the defects, although of vital importance to the physical and mental development of the child, are yet not serious defects and in the majority of instances can readily be removed. But the importance of the examination, as already pointed out, is that, without the examination, these defects would not be discovered until they had seriously interfered with the physical welfare of the child. Of more importance than either of these examinations has been the examination of 160 over-age children, and of these children the percentage of defects was 84. It should be noted here that there is a marked increase in the proportion of defective vision, breathing, bad teeth, hypertrophied tonsils, postnasal growths and pulmonary disease.

It has also been discovered that in the special schools for backward children the proportion of defects runs up to over 90 per cent., and it was also found that among the truants there existed a still larger proportion of physical defects. The number of children so examined has not been very large, but of over a hundred truants examined over 95 per cent. revealed such physical defects as interfered with the progress of the child. On June 1, 1906, in school No. 110, a special school for backward children, eighty-one children were operated on for hypertrophied tonsils and adenoids. After the operation there was a small riot in the neighborhood, caused by the mothers, due to the facts that the children were operated on in a place not suitable for the purpose, and that the operation, though short and comparatively painless, is necessarily a bloody one.

A report of seventy-seven of these backward children obtained by the Department of Health reveals the following significant facts:

All of the seventy-seven have improved physically and have been promoted.

All but four have done more in school in the past six months than in the previous two years.

One child did three years' work during the past year; that is, a child of 11, backward, was promoted rapidly and performed all the work that is expected of a child 6, 7 and 8 years of age.

Four of these seventy-seven children did not advance.

It may very readily be assumed that this rapid promotion was due almost entirely to the improvement in their physical condition, which resulted from the removal of their hypertrophied tonsils and postnasal growths, which had so seriously interfered with their breathing and consequently with their physical and mental development.

I have also examined 2,000 children who were sent to Sea Breeze at Coney Island, conducted by the New York Association for Improving the Condition of the Poor, the results of which were similar to the examinations of the Department of Health.

An interesting addition to the examination was obtained by measuring height and chest circumference of a large number of these children and in weighing them. It will be noted by referring to Tables 3 and 4 that for almost every age all the measurements and weights were below the standards obtained by Bowditch and Porter in the measurements and weights of school children in Boston and St. Louis.

The conclusions to be drawn as result of these important investigations are as follows:

1. A very large proportion of children have defects in their make-up, but most of which are not immediately serious and are very easily remedied. This has been shown by the remarkable investigations made by the Department of Health in New York City under the able direction of Dr. John J. Cronin, Chief Inspector of Schools. The experience of other physicians in the larger private schools and the experience of physicians in a large practice among children, all show that these minor defects exist to almost the same extent among children of well-to-do parents.

TABLE 1.
CHILDREN EXAMINED BY THE DEPARTMENT OF HEALTH, MARCH, 1905,
THROUGH DECEMBER, 1906.

Items Compared	March, 1905, to June, 1906, Unclassified Children		Sept. to Dec. 30, 1906, First Year Pupils		December 1, 1906, Over-age Children	
	Number	Per Cent.	Number	Per Cent.	Number	Per Cent.
Number examined	97,543	...	36,190	...	169	...
Num. needing treatment	64,735	66	25,075	69	142	84
Malnutrition	6,111	6	1,093	6	12	7
Enlarged glands	37,638	38	17,464	48	57	33
Defective vision*	30,789	31	3,533	21	66	39
Defective breathing	11,805	12	5,601	16	38	22
Defective hearing	1,936	2	229	6	3	1
Teeth	38,991	40	18,788	62	91	53
Hypertrophied tonsils	17,835	18	8,716	24	61	36
Post-nasal growths	9,700	10	4,857	13	25	14
Cardiac disease	1,635	2	356	1	5	22
Pulmonary disease	1,027	1	318	.9	6	3
Skin disease	1,947	2	600	1.6	None	None
Deformed spine	804	.8	105	.3	3	1
Deformed chest	555	.5	107	.3	5	2
Deformed extremities	859	.8	189	.5	None	None
Deformed palate	1,206	1	323	.9	1	.5
Mentality bad	2,427	2	640	1	8	4
Chorea	1,772	2	346	.9	4	2

*Only 16,737 children examined for vision.

TABLE 2.
SEA BREEZE EXAMINATION OF SCHOOL CHILDREN—SUMMER OF 1906.
Girls, ages 5 to 15. Boys, 5 to 12.

	Boys.		Girls.		Grand totals.		Total per cent. defect.	Ind. of Health percentages.
	No. exam.	No. defect.	No. exam.	No. defect.	No. exam.	No. defect.		
Teeth	555	412	788	562	1,343	974	72	40
Hypertrophied tonsils	550	85	769	101	1,319	186	13	18
Enlarged glands of neck	555	...	801	...	1,356	...	...	...
Anterior	...	400	...	436	...	836	61	30
Posterior	...	299	...	324	...	623	46	8
Chorea	517	4	760	8	1,277	12	9	10
Cardiac disease	519	30	765	79	1,284	109	8	1
Pulmonary disease	521	13	763	20	1,284	33	2	1
Skin diseases	513	6	755	9	1,268	15	1	1
Deformities	276	73	797	92	1,073	165	15	2
Defective vision	417	38	709	80	1,126	118	10	31
Defective nasal breathing	540	36	780	34	1,320	70	5	12
Adenoids	531	54	785	35	1,316	89	6	10
Defective hearing	445	19	699	33	1,144	52	4	1
Defective mentality	329	54	525	48	854	102	11	2
Poor nutrition	372	125	682	246	1,054	371	35	6
Deformed palate	544	20	790	20	1,334	40	2	1

TABLE 3.

MEDICAL EXAMINATION OF SCHOOL CHILDREN AT SEA BREEZE—SUM-
MERS 1905 AND 1906.
Girls 5 to 15.

Age.	Height.			Chest circumference.			Weight.		
	No. ex.	Aver.	Stand. ¹	No. ex.	Aver.	Stand. ¹	No. ex.	Aver.	Stand. ²
5	81	42.1	41.4	97	20.7	21.	58	37.3	37.
6	130	43.4	43.6	147	21.3	22.8	98	37.8	38.8
7	124	44.3	45.9	141	21.7	23.5	97	43.24	42.4
8	147	47.1	48.	162	21.24	23.8	121	45.5	46.8
9	133	47.9	49.6	152	22.83	24.5	119	51.2	51.9
10	146	50.1	51.8	159	23.5	24.7	123	57.11	55.12
11	123	53.08	53.8	131	24.4	25.8	91	62.3	61.4
12	130	55.3	57.1	142	25.24	26.8	99	70.5	68.8
13	72	57.1	58.7	83	26.2	28.	57	75.9	78.9
14	45	57.4	60.3	49	27.5	29.2	33	86.7	89.5
15	13	60.4	61.4	15	26.9	30.3	10	88.8	97.9

TABLE 4.
Boys 5 to 11.

Age.	Height.			Chest circumference.			Weight.		
	No. ex.	Aver.	Stand. ¹	No. ex.	Aver.	Stand. ¹	No. ex.	Aver.	Stand. ²
5	74	41.2	41.7	89	20.9	21.4	81	35.4	38.6
6	119	41.3	44.1	137	23.1	23.2	137	40.5	40.6
7	157	43.2	46.2	171	21.9	23.7	161	39.4	44.3
8	135	46.5	48.2	144	23.2	24.4	140	45.5	49.1
9	123	49.7	50.1	138	20.8	25.1	134	53.6	53.14
10	96	51.2	52.2	107	24.34	25.8	109	57.7	57.
11	101	52.9	54.	115	25.05	26.4	110	63.05	63.1

2. The seriousness of a large number of these defects become manifest so soon as the child enters on school life.

3. If these defects be not removed, the child becomes and continues dull, lethargic, lazy, stupid and backward and at times recalcitrant, obstinate, unmanageable and immoral.

4. In many instances where these last conditions have existed and have been alleviated, the child soon begins to assume a more normal aspect of physical and mental well being.

5. Some more active means are necessary to put the burden of responsibility on the parents and to instruct them in the necessity of attending to the health of their child, no matter how apparently trivial the ailment or defects may be.

AEROPATHY OR COMPRESSED AIR ILLNESS AMONG TUNNEL WORKERS.*

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Exposure of the human subject to an environment of greatly altered barometric pressure so disturbs the organism which has always been adjusted to the normal atmospheric pressure of fifteen pounds to the square inch that there frequently arises a train of symptoms at once most interesting and most varied.

No one term has ever been adopted for this curious affection; therefore *aëro*pathy suggests itself as simpler and more comprehensive than the older and more re-

stricted terms, "caisson disease," "diver's palsy," "bends," "compressed air illness" and "balloon sickness," for even this last-named disease is similar in its manifestations and probably identical in its etiology with that of compressed air illness.

The vast engineering feats of the past half century in which compressed air has been used to permit men to work under water for mining, for laying foundations of bridges, buildings, jetties, etc., and in submarine tunneling, have in effect created this disease, which has been aptly spoken of as "the disease of modern civilization" and "the nineteenth century disease."

From earliest times the human intellect has aspired to master the watery element. Indeed tradition has it that over 2,200 years ago Aristotle conceived the idea of the diving helmet and that the contemporary ruler, Alexander the Great, descended to the bottom of the sea in a diving bell. However this may be, the first authentic accounts date from 1525 A. D., when Sturmius or, according to other writers, Taisnier, invented the primitive diving-bell in which the only ventilation was afforded by the breaking of bottles of air carried in by the workers.

In 1605, a diving bell was used to raise parts of the sunken Spanish Armada.

The caisson in a practical form was designed in 1839 by Trieger, a French engineer, who employed it with success in coal-mining operations beneath the River Loire, and his observation of the occurrence of pains in the arms and legs of the workers constitutes the earliest mention of this new disease.

During the past sixty years, numerous contributions have been made to the literature of *aëro*pathy, in French by Pol and Watelle, Paul Bert,¹ Raneaux and others, in English by Snell,² Hill and Macleod,³ Hill and Greenwood,⁴ Oliver⁵ and others, in German by von Schrötter, Heller and Mager,⁶ and by our Americans, A. H. Smith,⁷ Jeminet and others.

The extensive use of compressed air in recent engineering enterprises has made the occurrence of *aëro*pathy much more common, to-wit: in the building of the new Firth of Forth Bridge in Scotland, the Brooklyn bridge, the great bridge at St. Louis and the Blackwall tunnel under the Thames in London, which till twelve years ago was the greatest undertaking of this kind.

To-day, in New York, the construction of numerous great river tunnels and of foundations for tall buildings and bridges, engages the labor of many more men in compressed air than at any previous period, and cases of illness, distributed, as they are, throughout the city, are daily being brought to the attention of greater numbers of practitioners of medicine.

The subject matter of this paper, apart from the historical and certain theoretical considerations, is founded on my experience of more than a year on the medical staff at the East River tunnels from Thirty-fourth street, New York, to Long Island City.

For the use of the Pennsylvania, New York & Long

1. La Pression Barométrique, Paris, 1878.

2. The Blackwall Tunnel from a Medical Point of View, Hospital, London, 1897, xxii.

3. Caisson Disease and Diver's Palsy, Journal of Hygiene, 1903, iii, 401-445.

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5. Dangerous Trades, G. P. Dutton, 1902; A Lecture on Caisson Disease, Lancet, 1899, vol. 1; Caisson Disease (translation), Annals d'Hygiene Publique, 1906, 4 s., v, 385-410.

6. Heller, Mager and von Schrötter: Luftdruckerkrankungen (2 vols.), Vienna, 1900.

7. A. H. Smith: Physiologic, Pathologic and Therapeutic Effects of Compressed Air, New York, 1894.

1. Bowditch's standard. Standards reduced to net weight according to scheme suggested by Holt (Dis. of Children, edition 1897, p. 19).

2. Porter's standard.

* This paper was read before the Quiz Medical Society of New York City, May 11, 1907.