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THE MORTALITY OF EPILEPSY IN ASYLUMS
FOR THE INSANE.¹

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IF an interne in a general hospital, in consulting the authorities on such diseases as pneumonia and typhoid fever, should find that, almost without exception, they either said nothing of any danger to life from those diseases, or stated explicitly that they very rarely proved fatal, he would probably before very long begin to wonder whether his cases were of very exceptional severity, or there was something entirely wrong in his treatment. In a somewhat similar quandary does the physician in an asylum for the insane find himself in respect to a disease which, if I were to judge from my own experience, which has extended over a period of thirteen years and comprised more than two hundred cases, I should compare for deadliness, not to such diseases as I have mentioned above, but to small-pox and yellow fever.

In the *Medical Record* of April 28, 1888, I published an article in which I showed that in the Michigan Asylum for

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the Insane, from its opening to that date, a larger number of epileptics had died from epilepsy than from all other diseases put together, and that the proportion of epileptics dying from the direct effects of that disease to the total number of cases admitted was larger than that of deaths in the general population of the institution from all causes combined. I also showed, from the statistics published in the reports of thirty-seven similar institutions for the preceding year, that the experience of the Michigan Asylum in that respect was more favorable than the average. In that institution, out of 234 epileptics admitted, 62, or 26.5 per cent., had up to that time died of epilepsy. Thirty-seven asylums reported 535 epileptics admitted and 143 deaths, or 27.6 per cent., in 1886, and fifteen which gave statistics from the beginning reported 2,029 epileptics admitted, with 611 deaths from epilepsy, a mortality of 30.1 per cent., making no allowance for those who had been discharged and those still under treatment.

I have never seen any attempt either to controvert or to explain away those statistics, but they do not seem to have attracted very much attention, and works by standard authors appearing subsequently to that time have reiterated the statements previously current in regard to this subject. Gowers (*Diseases of the Nervous System*, p. 1104) says :

“The risk to life in epilepsy is not great. The mere violence of the fit, appalling as it may be in its aspect, rarely causes death. The dangerous ‘status epilepticus’ is too exceptional to constitute a measurable element in the prognosis. The greatest danger is in the cases in which there is a tendency to turn on the face, or to vomit after a fit, but even this is slighter than that of the accidents to which the attacks expose the patient. Many epileptics die by drowning ; the fit not only occasions the fall into the water but prevents any effort to escape, and hence an epileptic has more than once been drowned in a ditch.”

Ranney (*Lectures on Nervous Diseases*, p. 482) says :

“Finally it may be said that little danger to life is to be apprehended in epileptic seizures. I have never known a case where death occurred directly from the fit, although

many cases may have met their death indirectly from that cause, through suffocation, drowning, etc."

The discrepancy between such statements as these and my statistics is obvious enough, and its cause seems to me a matter of scientific and practical interest. As subsequent experience has only confirmed the views expressed in my former article, I venture to call attention to the subject once more, rather in the hope of eliciting facts from those whose experience has been in another field than because I have anything essentially new to offer.

TABLE I.

Showing total admissions, total deaths, admissions of epileptics, and deaths from epilepsy shown by the annual and biennial reports of 82 asylums for the insane for 1890.

	Total Admissions.	Total Deaths.	Epileptics Admitted.	Deaths from Epilepsy.
Arkansas, State Asylum, Little Rock.....	183	65	14	12
California " " Stockton.....	326	111	7	4
" " Agnews.....	201	17	23	2
Napa Insane Asylum.....	697	241	17	14
Connecticut, Hospital for Insane, Middletown.....	368	105	34	9
Hartford Retreat.....	60	16	3	..
Delaware, State Hospital, Farnhurst.....	267	29	24	..
Illinois, Central Hospital, Jacksonville.....	733	105	15	8
Northern " Elgin.....	466	58	16	2
Southern " Anna.....	436	75	37	8
Eastern " Kankakee.....	1,238	177	55	9
Indiana, Central " Indianapolis.....	664	70	43	6
Northern " Longcliff.....	732	66	27	4
Iowa, Hospital for Insane, Mt. Pleasant.....	753	107	19	4
" " Independence.....	630	124	34	7
Kansas, State Asylum, Ossawatimie.....	247	71	5	9
" " Topeka.....	526	99	27	8
Louisiana, Asylum for Insane, Jackson.....	178	100	17	7
Maine, Insane Hospital, Augusta.....	253	73	5	9
Maryland " " Catonsville (1889)....	94	30	5	2
Mount Hope Retreat.....	299	64	6	3
Massachusetts, Boston Lunatic Hospital...	210	48	14	1
Worcester " ".....	436	80	15	9
Worcester Insane Asylum....	45	31	1	1
Taunton Lunatic Hospital.....	331	70	12	3
Danvers " ".....	386	86	10	1
Northampton Lunatic Hospital.	170	21	11	2
Westborough Insane Hospital.	310	53	8	5
Michigan, Asylum for Insane, Kalamazoo.....	465	98	21	4
Northern Asylum, Traverse City ..	622	67	29	7
Eastern " Pontiac.....	637	98	47	8

TABLE I.—*Continued.*

	Total Admissions.	Total Deaths.	Epileptics Admitted.	Deaths from Epilepsy.
Minnesota, Hospital for Insane, St. Peter.....	577	110	13	12
2d Hospital for Insane, Rochester.....	494	118	17	10
Mississippi, State Asylum, Jackson.....	125	33	9	1
Eastern Asylum, Meridian.....	76	34	13	6
Missouri, St. Louis Asylum.....	230	41	14	1
State " No. 1, Fulton.....	295	88	19	8
Nebraska, State Hospital Asylum.....	395	51	29	..
Norfolk "	219	20	18	..
New Hampshire, Asylum for Insane, Concord.....	276	53	7	..
New Jersey, State Lunatic Asylum, Trenton...	177	76	6	7
" Asylum, Morris Plains.....	213	68	2	4
Essex Co. Asylum, Newark.....	160	36	3	2
New York, Homœopathic Hospital, Middletown	288	30	5	..
Utica "	507	93	29	1
Binghamton "	104	55	5	5
Willard "	225	123	11	8
Buffalo "	346	42	12	3
Hudson River " Poughkeepsie	407	46	2	3
Asylum for Insane Criminals, Auburn	74	10	23	..
North Dakota, Hospital for Insane, Jamestown	174	28	8	4
North Carolina, Asylum, Raleigh.....	168	51	7	5
Eastern Asylum, Goldsboro ..	224	64	17	2
Ohio, Longview Asylum, Carthage	176	58	14	1
Dayton "	196	54	9	5
Columbus "	277	59	6	1
Athens "	229	63	26	1
Toledo "	510	77	32	5
Oregon, State " Salem.....	444	67	19	2
Pennsylvania Hospital, Philadelphia	178	27	2	..
State Hospital, Norristown.....	480	192	23	16
" " Harrisburg.....	180	70	17	3
" " Danville	580	151	24	16
" " Warren.....	219	42	12	4
" " Dixmont	256	71	6	4
Philadelphia City Hospital.....	283	103	14	3
South Dakota Hospital, Yankton.....	104	17	2	2
South Carolina Lunatic Asylum, Columbus.....	334	141	40	15
Tennessee, Eastern Asylum, Knoxville.....	182	39	9	3
Western " Bolivar	284	15	19	..
Texas, State Asylum, Austin.....	160	24	13	3
North Texas Hospital, Terrell.....	264	30	12	5
Virginia, Eastern Asylum, Williamsburgh.....	78	31	5	1
Central " Petersburg	156	47	3	..
Western " Staunton	125	32	10	1
Vermont, Asylum, Brattleboro.....	220	79	12	4
Washington, Western Hospital	258	54	10	4
West Virginia Hospital, Weston	455	143	46	23
Wisconsin, State Hospital, Mendota.....	515	59	32	9
Northern Hospital, Winnebago.....	758	129	32	5
New Brunswick Provincial Asylum.....	145	57	5	3
Nova Scotia Hospital for Insane, Halifax.....	94	22	2	..
	27,865	3,212	1,326	389

I have examined, with reference to this point, all the reports which I have been able to obtain of institutions for the insane in the United States and Canada for the year 1890. I have failed to secure the reports of a few asylums, and in a considerable number of the instances the statistics published failed to give the desired information. Eighty-two institutions furnished statistics in an available form, which I have embodied in the accompanying tables. Table I. includes the admission of epileptics and deaths from epilepsy for the period, whether annual or biennial, covered by the reports, and, for purposes of comparison, the total admissions and deaths for the same period.

It appears that, in these institutions, during the time covered by their reports, 1,326 epileptics were received, and that during the same time 389 deaths occurred from epilepsy, or 29.27 per cent. of the number admitted. During the same period the total number of admissions was 27,865 and the total number of deaths 3,212, or only 11.88 per cent.

Fifteen of these institutions give statistics covering the whole period of their operations. Table II. shows the total admissions, total deaths, admissions for epilepsy and deaths from epilepsy in these institutions, classified according to sex.

TABLE II.

Showing total admissions, total deaths, admissions for epilepsy and deaths from epilepsy in 15 asylums during their periods of operation.

	ADMITTED.			DIED.			EPILEPTICS ADMITTED.			DEATHS FROM EPILEPSY.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Connecticut Hosp., Hartford...	2,783	2,506	5,289	612	483	1,095	151	78	229	28	18	46
Minnesota 1st Hosp., St. Peters	3,074	2,324	5,398	525	390	915	148	93	241	58	45	103
Minn. 2d Hosp., Rochester....	1,514	949	2,463	242	138	380	81	34	115	27	17	44
Miss. State Asylum, Jackson...	1,384	1,305	2,689	414	372	786	116	79	195	75	25	100
Iowa Hosp., Mt. Pleasant...	4,239	3,110	7,358	806	541	1,347	201	123	324	53	182	182
Binghamton Hosp., New York	1,108	992	2,100	316	215	531	80	54	134	29	14	43
Hudson River Hosp., New York	2,328	1,928	4,256	421	227	648	137	95	232	24	5	29
Asylum for Insane Criminals												
Auburn, N. Y.	658	29	687	104	3	107	15	2	17	5	—	5
Longview Asylum, Ohio.....	3,260	3,043	6,303	773	675	1,448	201	97	298	57	37	94
Dayton Asylum, Ohio.....	3,543	3,326	6,869	574	517	1,091	129	76	205	36	24	60
State Hospital, Warren, Pa....	1,208	1,021	2,229	270	200	470	77	35	112	35	17	52
State Hospital, Danville, Pa....	2,037	1,420	3,457	423	194	617	153	61	214	43	22	65
Central Asylum, Petersburg, Va	1,203	1,126	2,329	295	328	623	79	63	142	18	17	35
Wisconsin State Hosp., Mendota.....	1,873	1,375	3,248	397	322	719	96	41	137	33	21	54
Provincial Asylum, St. Johns, N. B.	1,144	887	2,031	291	245	536	77	37	114	25	12	37
	31,356	25,350	56,706	6,463	4,850	11,313	1,831	968	2,799	622	327	949

From this table it appears that out of 1,831 admissions of male epileptics, 622, or 33.97 per cent., and of 968 female epileptics 327, or 33.89 per cent., died of epilepsy. The corresponding percentages of deaths to total admissions are 24.04 and 19.93 respectively.

It would appear probable, then, that about one-third of the epileptics admitted to hospitals for the insane in this country die of epilepsy in the asylums, and it is fair to assume that some of those who are cut off by other diseases are saved in that way from death as a result of their chronic trouble. The fact that sufferers from locomotor ataxia, multiple sclerosis, bulbar paralysis and other chronic and fatal diseases, are often cut off by intercurrent disorders is not regarded as affecting the unfavorable prognosis in those diseases. So far as I have had knowledge of the causes of death in the epileptic insane, the mortality from epilepsy has been considerably over 50 per cent. In the Michigan Asylum for the Insane, up to the time of publication of my former paper, out of sixty-two deaths of epileptics thirty-eight resulted from epilepsy. In the Arkansas State Lunatic Asylum the ratio is nearly the same, as will appear from the following table :

TABLE III.

Showing results in 162 cases of epilepsy treated in the Arkansas State Lunatic Asylum.

	Males	Females	Total
Discharged	21	16	37
Died of epilepsy	31	7	38
Died of other diseases ..	14	13	27
Remain	39	21	60
Total	105	57	162

The above table includes all cases of epilepsy that have been under treatment in this institution since it was opened in the spring of 1883. I have not included among the deaths from epilepsy any cases in which the records show the death to have resulted from accident. I have excluded, for instance, a case in which the cause of death is given as

"suffocation," and another in which it is attributed to "œdema of the lungs," because the records do not show the circumstances, although I think it altogether probable that both of them were due to epilepsy.

The tendency of epilepsy to shorten life is further shown by the ages of the epileptic inmates of hospitals for the insane. The mental derangement produced by this disease is usually progressive; recovery and material improvement are rare, and if it had no unfavorable influence on longevity it might naturally be expected that the proportion of middle aged and old people among the epileptic inmates of such institutions would be at least as great as in their general population. Such has not been the case in either of the asylums with which I have been connected. Most of their epileptic inmates have been young people. The following table will show the facts in this respect in regard to this institution.

TABLE IV.

Showing ages attained by 162 epileptics during their residence in the Arkansas State Lunatic Asylum.

AGES.	Discharged.			Died.			Remain.			Total.
	M.	F.	T.	M.	F.	T.	M.	F.	T.	
Under 10 years.....	1	..	1	..	..	..	..	..	..	1
10 to 20 years	6	6	12	5	6	11	9	3	12	35
20 to 30 "	8	4	12	19	9	28	10	4	14	54
30 to 40 "	3	6	9	11	2	13	12	11	23	45
40 to 50 "	3	..	3	6	3	9	7	3	10	22
50 to 60 "	..	..	..	2	..	2	..	1	1	3
60 to 70 "	..	..	..	2	..	2	..	..	..	2
Total.....	21	16	37	45	20	65	38	22	60	162

Out of 162 epileptics treated, only 28, or 17.22 per cent. have passed their fortieth year while inmates of the Asylum. Of the 65 who died, 13, or just 20 per cent., attained that age. In the Michigan Asylum the proportion was somewhat larger—58 out of 234 patients treated, or 24.78 per cent., reaching the age of forty or more.

As to the manner of death in the cases which have come under my observation, it has most frequently followed the status epilepticus, but it has not been very uncommon for a few convulsions, or even a single one, of exceptional severity, to leave the patient in a semi-comatose state, from which he never rallied. Œdema of the lungs is rather common after the status epilepticus, when, as sometimes happens, the patient lives for some time after the cessation of convulsions, and in two cases I have known it to come on after a single convulsion and prove rapidly fatal. In several cases there has been, with profound dementia, a gradual physical failure, and the patient has died from exhaustion.

In the majority of cases in which I have had the opportunity to make post-mortem examinations, they have thrown no light on the immediate cause of death. In one case a cerebral hæmorrhage, occurring in a convulsion, proved fatal. In two cases, in which the patients lay semi-comatose for several days after convulsions, I found lobular pneumonia, which may have contributed to the fatal result. Œdema of the lungs, as already mentioned, has been present in several instances.

Enough has been said to show that epilepsy, as it occurs in hospitals for the insane in this country, is a disease of very serious prognosis. The question becomes of interest, whether this condition of affairs is confined to those institutions, or whether the general opinion hitherto held in regard to this subject is a mistaken one. I have never seen any attempt to treat the matter statistically, except my own previous article. Hospitals for the insane present the advantage, in this respect, of containing a large body of epileptics in regard to whom definite information can be had, but it is probable that the cases there collected are, as a class, of more than average severity. Still, in a large proportion of those that I have seen, the convulsions have not been remarkably frequent nor very severe. The mental disturbance does not bear any very constant proportion to the severity of the disease in other respects, and it seems to me improbable that all the difference between the facts

that I have collected and the views of writers on the subject can be accounted for by anything in the character of the cases. At all events, I think it is incumbent on those who hold that the risk to life from epilepsy is small, to support their belief by something more than bare assertions. Many things may prevent a physician in private or dispensary practice from knowing what becomes of his epileptic patients, but until he knows of what they die, it seems to me, in view of the facts here presented, that he should be cautious in asserting that they do not die of epilepsy.

THE ALTERATIONS FOUND IN THE PERIPHERAL NERVES OF PROGRESSIVE GENERAL PARALYSIS.

The histo-pathological changes occurring in the peripheral and intra-muscular nerves, and to a greater degree in the trunks of the cranial and spinal nerves, consist of a parenchymatous neuritis of peripheral origin. In the various spinal nerves—motor, sensory and mixed—not only are the trophic centres normal, but the anterior roots, and that portion of the posterior roots between the post-spinal ganglia and the junction with corresponding anterior roots, are likewise normal.

2. The intensity of the alterations is in direct ratio to the distance from the nerve centres.

3. The different etiological factors (alcoholism, syphilis, etc.), and to the various complications (tuberculosis, etc.), must be attributed in all probability the unequal distribution of the lesions, as found in the muscular and cutaneous nerves. How much of these alterations depend upon progressive paralysis and to the various complications is very difficult to determine.

4. The existence of these simple and degenerative atrophies of the peripheral nervous system is constant. The mode of origin is unknown. From the fact that the nerve endings are in advanced stages of degeneration, while the nerve centres and the adjacent nerve roots are unimpaired, it is most probable that the lesion is comparable to an ascending neuritis, beginning at the periphery and ascending centrally.—(Dott. Roselino Colelia in *Annali di Neurologio*. Fas. II, IV, 1891.)

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