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Contributors

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LOGAN, T.M.
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MEDICAL HISTORY

OF

THE YEAR 1868, IN CALIFORNIA.

A PAPER READ BEFORE THE

"Sacramento Society for Medical Improvement,"

FEBRUARY 16th, 1869,

And Published by Order of the Society.

By T. M. LOGAN, M. D.,

VISITING PHYSICIAN TO THE SMALL-POX HOSPITAL, SACRAMENTO.

San Francisco, Cal.:

PRINTED BY F. CLARKE, 411 CLAY STREET,

Between Battery and Sansome Streets.

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CORRESPONDENCE.

——:——

Sacramento, California,

February 28th, 1869.

T. M. Logan, M. D.:

Dear Sir—

At a meeting of the "Sacramento Society for Medical Improvement," held February 16th, it was unanimously voted to publish your valuable paper upon the Medical History of 1868; and I was instructed to request you to place the manuscript at the disposal of the Society.

Very respectfully, yours,

G. L. SIMMONS, M. D.,

Secretary S. S. for M. I.

Sacramento, California,

February 28th, 1869.

G. L. Simmons, M. D.,

Secretary of "Sacramento Society for Medical Improvement":

Dear Sir—

Your note of this date, requesting on behalf of the "Sacramento Society for Medical Improvement," a copy of my paper upon the "Medical History of the Year 1868, in California," has been received. I accede to the re-

quest, on the same principle of duty which induced me to write the paper—regarding the opportunity thus afforded me rather as a privilege granted, than as an honor conferred. At some future day, when the present pestilential influences shall have passed away, I hope to be able to resume the discussion of the important topics broached in the concluding remarks of the essay. For the present, permit me to state, that the virulence of the epidemic has so far abated, that, during the month just passed, of 24 cases treated at the Small-Pox Hospital, only 3 have died, 11 have been discharged cured, and 10 remain under treatment, giving a fair promise of recovery. With my best wishes for the prosperity and usefulness of the Society you so ably represent,

I remain,

Yours, respectfully,

T. M. LOGAN, M. D.

MEDICAL HISTORY

Of the Year 1868, in California.

[Read before the "Sacramento Society for Medical Improvement," on the 16th of February, 1868, and ordered for Publication.]

By THOS. M. LOGAN, M. D,, Visiting Physician to the Small-Pox Hospital, Sacramento.

The year 1868 will ever remain conspicuous on the pages of history, not only from a medical, but also from a cosmical point of view. The whole universe has been in commotion. In the air above and in the incandescent elements below, there have been turmoil and strife, while over the surface of the earth a great *pandemic* wave has rolled with destructive impetuosity. And now that the *action* is, we trust, well nigh over, and the *dust* and *smoke* of the vast *battle-ground* are beginning to clear away, it is both meet and right for us to make a reconnoissance of the field of operations—to take an account of the *killed* and *wounded*, and to place upon record the results of our investigations. Nor will the military metaphor, borrowed from a lamented friend,* be deemed entirely out of place, when it is remembered that the terrible finale of strife is in that last act of the drama in which the surgeon plays his part. From no other source can we get such an appreci-

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* The late Dr. E. D. Fenner, M. D., Professor of Theory and Practice of Medicine in the New Orleans School of Medicine.

ation of the miseries of a campaign as from its medical reports. Larrey's memoirs of Napoleon's wars is the only history which gives a real account of their dreadful ravages.

We have encountered a devastating though unseen foe, and while passing under review the victims strewn along his destructive march, let us endeavor to gather wisdom from experience, and thus enlightened by the past, go onward with a calm heroism and firm determination to meet the future, in the discharge of the high and solemn duties appertaining to our mission.

In order to establish the correctness of the assertions just made, and to show the universality of the fearful phenomena to which, in common with other parts of the world, California has been to a certain degree subjected, I will enumerate some of the most remarkable in their order of occurrence, for the items of which I am indebted to the current daily papers, and especially to the "*Sacramento Union.*"

As preludes to this calamitous era, I may mention the violent eruption of Vesuvius commencing on the 15th of November, 1867, and continuing up to the present time. Also the terrific commotion in the Caribbean Sea, November 18th to 20th, with forty-seven consecutive earthquake shocks at St. Thomas, and a tidal wave sixty feet high, sweeping everything before it with the besom of destruction. In December following, earthquake shocks were felt for three days in the State of New York, and from this time to the 11th of January, 1868, there were constant recurring shocks at Antigua. From this last date to the 27th of January the shocks continued to be felt in the West Indies, and about the same period malignant fever and cholera were reported to prevail at St. Thomas and Havana, and also at Buenos Ayres, with great mortality—carrying off at the latter place, 5,000 persons in forty days. At Teneriffe on the 17th, and in Scotland on the 26th, violent hurricanes

and heavy gales were reported. During the month of February a succession of terrific gales in England and Wales, and alarming earthquakes at Shanghae and Ningpo, were experienced. March 1st to 10th, the continuance of earthquakes was such in Guatemala, that the inhabitants lived in tents for safety. From the 10th to 17th, violent shocks at Porto Rico, at Guayaquil and St. Thomas, were followed by a tidal wave, leaving ships high and dry on land. March 24th, a slight shock in California. March 27th to April 3d, two thousand shocks reported to have occurred in the Sandwich Islands, ending in a great eruption of Mauna Loa. About the middle of April, earthquakes were daily felt at Porto Rico, and on the 4th a great tidal wave at Guadalupe. About this time one hundred deaths a day from Yellow Fever at Lima and Callao, while in Peru from this date up to June 15th, ten thousand deaths were reported. On the 16th, news was received of severe shocks at Antigua, and about the same time, of the appearance of small-pox and typhoid fever in Jamaica. May 24th, earthquakes in Central America and typhus fever in Vera Cruz.

June 1st and 17th, continued shocks at Chiriqui, Ecuador, and elsewhere in South America. The eruption of the 18th of June of Mauna Loa in the Sandwich Islands, together with the incessant shocks that occurred at that time, were contemporaneous with shocks felt in Australia on the opposite side of the Equator, and four thousand two hundred miles distant. During this month small-pox of a very malignant type assumed its epidemic features in San Francisco, and the mortuary list in that city mounted from forty-five to sixty-nine in a single week. In July cholera appeared in Havana, as well as on the Barbary Coast, also a malignant epidemic was decimating Ceylon and the Mauritius. During this month intense heat was experienced in Canada and our Eastern States, causing an unprecedented number of deaths by sun-stroke. Also accounts from all parts of the world represented the death-rate

greatly on the increase. August—Spain suffering from failure of crops and prospective famine and pestilence ; 13th, a great earthquake in Peru and Ecuador. Arequipa, a city of fifty thousand inhabitants, and Arica, of twenty-five thousand, were destroyed. During this month the whole Western Coast from New Granada to Chili was convulsed and towns in great numbers laid in ruins, either by the violence of the shocks, or by the subsequent influx of the sea, or by both. This tidal wave was felt severely in Australia, where there were also earthquake shocks ; loss of life estimated at sixty thousand. August 17th, (*August* 16th, as compared with time in the Sandwich Islands) shocks felt at several points in New Zealand and the former place. August 23d, a great earthquake in Callao and a heavy wave inundating the city, followed by an epidemic of yellow fever. September 10th to 30th, succession of earthquakes in Peru and Juan Fernandez, followed by tidal waves and heavy rains in Valparaiso. During this month an epidemic cattle disease appeared in the Southern and Western United States. October 8th, earthquakes in Japan ; 9th, Vesuvius threatening another eruption ; 13th to 15th, shocks all along the Coast of Peru, one lasting nearly three minutes ; 21st, heaviest earthquake ever known in California—its focal point being at Haywards, San Leandro, Oakland and San Francisco. Other shocks on the 23d, 25th and 27th—26th, earthquakes reported in Ireland and England.

November 14th to 19th, Vesuvius again in violent commotion. December 9th, earthquakes continue to be felt at Arica. Small-pox at Arequipa and extending in Lima. Yellow fever on the Coast, and committing terrible ravages in Pisagua. 20th, volcano at Colima exhibiting symptoms of internal commotion, and the most destructive earthquake on record there, and at Manzanillo, Colima, and surrounding country. Thus ends the record of 1868, with accounts confirmed of the prevalence of small-pox in North and

South America—throughout the entire length of the Pacific Coast.

Without attempting to trace any uniformity of connection between the play of physical forces and terrestrial affairs, and confessing to an inability to understand how, as effects to a cause, follow such pestilential visitations as have been tacked to the sublime and terrible phenomena just passed in review, I cannot but regard the recent convulsions of nature, especially on our Western Coast, as suggestive of some relation between them and the diseases with which we have been particularly afflicted. From the earliest pages of history we read of remarkable coincidences, linking plagues and pestilences with earthquakes, comets, meteors, etc. Even in the pages of Holy Writ,* in the fourteenth chapter of the Book of Zechariah, we find him prophesying that an *earthquake* shall precede the *plague*, which he foretold should destroy the enemies of Jerusalem; and in the gospel of St. Luke, the physician, we read in the sixteenth chapter and eleventh verse, "and great earthquakes shall be in divers places, and famines and pestilences." The limits of this paper will not permit me to enumerate the many relevant instances that may be adduced, confirmatory of the theory here broached, which obtained in former times, and which it would be the part of wisdom not to discard too hastily.

Not to dwell on the nervous depression produced by panic, or the fear of comets and meteors, especially in olden times, which, by deranging the functions of the organism, destroys the power of resistance to disease, we have only to turn to the Bridgewater Treatises, to learn from Dr. Prout the *modus operandi* of volcanic eruptions and earthquakes. Vast volumes of mephitic fumes, impalpable but heavy dust, ashes and gases of all descriptions,

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* As quoted by Haviland, to whose treatise on the "Climate, etc., of Greece," I am indebted for many facts and suggestions incorporated in this paper.

are hurled with prodigious force into the higher regions of the atmosphere, where the current rapidly wafts them over distant lands, and thus impregnates the air with an invisible gaseous poison. A small bubble of this gas, which is supposed to be allied to seleniuretted hydrogen, deprived Berzelius completely of his sense of smell for fifteen days.—Again we know the effect that any irregularity of the seasons produces on the health of a country, and that earthquakes are often ushered in or followed by weather totally different from that which generally prevails. The sun grows red and a haziness pervades the air for weeks before the catastrophe. Such it will be remembered was the case before the late October earthquake in California, and how it puzzled the members of the "San Francisco Academy of Sciences" to account for the phenomenon. Again, it has been observed in England during the Small-pox in 1848 which preceded the Cholera, that the months during which it was most virulent were characterized by the presence of a great amount of ozone in the atmosphere. The greatest mortality took place in December with an excess of ozone. Now, in order to sustain the electrical theory of earthquakes, "Caxton" * states the shocks of 21st of October last, so stirred up the waters of the bay of San Francisco, that a peculiar odor, which I well remember, somewhat resembling sulphur, was evolved, of such intensity that the oysters were for several days almost inedible.—In this way we perceive how earthquakes may form a potent source of disease.

I have touched upon these points, because I believe that everything connected with the history of earthquakes, their antecedents, and their sequels, will prove valuable additions to the literature of our profession, and now turn from such

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* Philosophy of Earthquakes. By W. H. Rhodes, L. L. B., page 55.—*Alta Caiifornia Almanac*, 1869.

general considerations to a more special review of the pestilential characteristics of the past year, especially in California.

Weather.

To begin with the weather, I would premise that the climatic peculiarity of the year 1868, according to the observations recorded by Dr. Henry Gibbons, in which I entirely coincide, belongs to a great atmospheric perturbation, involving the northern and temperate regions of the American continent, presenting to the Atlantic Ocean. These have been visited by an extraordinary degree of heat, while the reverse has been observed on the Pacific slope, from Alaska to California on one side, and in China and Japan on the other. The disturbance began probably in the summer of 1867, which was, in this locality, one of the hottest on record, followed by an uncommonly rainy and cloudy winter, (the rain-fall in Sacramento being 12.522 inches plus the average of 19 years,) and succeeded by the coolest and most cloudy summer ever observed. At San Francisco, during the three summer months, the thermometer never once rose above 75°, and only on ten days reached 70°. During the same period there were but twenty days of clear sky from sunrise to sunset—the average number, in 18 years, being 44. These irregularities of climate, together with the earthquake and meteoric phenomena already noticed in the order of their occurrence, are attributable, according to Prof. Delisser of Jamaica, to the combined influences resulting from the peculiar relation of the moon and planets to our earth; and certainly when we reflect on the extraordinary astronomical conjunctions that have taken place, and the remarkable verification of the predictions made by him, based upon the law of Kepler, thereto applied, we cannot but believe that there is much of truth in the theory which points to these phenomena as potential causes affecting the condition of the weather, and necessarily the health of all subjected to its influence.

Pestilential Constitution.

As with the weather, so we find the diseases of the year partaking of the same world-wide, comprehensive range. A constantly progressive tendency to the development of all forms of diseases, especially of an endemic or febrile character, blending with, or following each other, was maintained with remarkable regularity. That the oscillations of this pandemic wave were felt in California, will, I think, abundantly appear from the discussion of the high rates of mortality, enhanced by a most malignant type of small-pox, above all those of former years, with the exception of the cholera year of 1860, and which I now propose to make from the data furnished by San Francisco and Sacramento.

It is necessary to premise that the population of the former place at the present time, is estimated to be 120,000. The annual mortality (A. D. 1867) being 2,492, showing 1 death in every 48 inhabitants; while in the latter city, the population being 20,000, the mortality for the same year was 295, or 1 in 68.

The medical constitution of the first month of the year under discussion, seems to have been especially obnoxious to the organs of respiration. There had been a great deal of rain during the two preceding months, with a southerly tendency in the wind, and of course an excess of moisture in the air. It may be conjectured that the seeds of pulmonary diseases were then sown, to be developed in January, the temperature of which month was considerably below the average, and which in fact was the case during all the year. Excess of moisture in the atmosphere has two effects upon the body—one general and relaxing, the other local. With regard to the latter, it is well known that *warm, moist* air is most congenial to the irritable lining of the air tubes, and prevents that drying process which is so detrimental to this highly sensitive membrane, as well as to the func-

tions of the cutaneous surface and the organs in direct sympathy with it, and which has been recently so admirably discussed in a paper read before this Society by Dr. Harkness, in connection with electrical influences, produced by our desiccating north-west winds. When, however, the moisture is attended with a *chilling coldness*, it must necessarily, by impeding the healthy action of the skin, thereby also overtax the internal organs. This state of things must re-act upon the lungs, and impose upon them extra duties at a time when they are but indifferently up to their own. With regard to the character of the diseases of the respiratory organs that prevailed during this constitution of the air, it may be remarked that all the forms cognate to irritation of the bronchial mucous membrane, as well as of the pulmonary tissue and its investments were met with; especially, that acute form of phthisis described by Louis, the semitertian character of the fever accompanying which, so often misleads the practitioner. Probably the same atmospheric conditions that are favorable to the invasion of this disease, increase the mortality by it; for we find in the mortuary table for January, in San Francisco, the deaths by phthisis and inflammation of the lungs mounting up to 51—the total mortality being 228; while in Sacramento, the number of deaths by the same diseases was 14—the total mortality for the month being 34, and showing a remarkable difference in the percentage of mortality in favor of the first locality.

In February, March and April, the death-rate in California subsided to its average standard, being for these three months in the order named; in San Francisco, 209, 195 and 193; and in Sacramento, 25, 21 and 22—the mortality from phthisis and pneumonia declining during these respective months to 46, 45 and 40 in the former place, and 6, 5 and 7 in the latter. The influence of warmer weather, especially in favor of Sacramento, is here distinctly shown, and tends to establishing the correctness of what has just been advanced as to the predisposing causes of pulmonary

affections. But although the mortality during these months remained at its normal standard, other diseases significant of an eruptive diathesis began to manifest themselves. Erysipelas, anthrax, pertussis, varicella and scarlatina, all prevailed to a considerable extent, but as yet without the fatal tendencies or sequelæ that afterwards followed in the wake of some of these diseases, and increased the infantile mortality. This observation is remarkable in regard to erysipelas, inasmuch as a reduction of temperature and other attributes of winter and spring, are not only conducive to its appearance, but also to its malignancy. Whether anthrax was dependent for its development upon atmospheric combinations, or whether the system became more prone to throw out morbid matter in the characteristic form of a carbuncle or boil, is a question I cannot answer, having an insufficiency of facts to warrant even a most general opinion.

That whooping cough is induced by a specific poison, there is little doubt; but in what manner this agent is generated, is not determined. It may exist with many other poisons, and in this case they often influence each other's actions. "The small-pox and whooping cough," says Dr. Aitken, "have often co-existed, and a very fatal and common combination is measles and whooping cough. Whooping cough and cow-pox are not unfrequently combined," and I may add, the same has been observed by me with regard to chicken-pox.

The epidemic influence, which generally has the effect of increasing the extent and mortality of all other diseases, seemed to exercise no power on scarlatina. This exanthem assumed this spring its most simple dress, so much so that I find not a single death attributed to it in the mortality reports of Sacramento. Not so, however, with measles, which presented its worst features, not only in the ordinary sequelæ, but in the primary form—the eruption

sometimes becoming suddenly black, or of a dark purple with a mixture of yellow. Sydenham relates the fact, that the epidemic measles of the beginning of the years 1670 and 1674 introduced the small-pox, which, he remarked, was in the second named year so similar to that which raged in 1670, "that we might almost say that the old disease had broken out afresh, rather than that a new one had originated." Whether the same epidemic constitution is favorable both to small-pox and measles, seems to be a question yet unsolved; but I am inclined to the opinion that there is a certain association between them, and which opinion is strengthened by the fact that I have observed no difference in the meteorological conditions which obtain during their separate prevalence. Schonlein classifies measles as a peculiar exanthematic form of catarrh, and places scarlatina amongst the group of erysipelatous diseases. The experience of this year tends to establish the correctness of this pathology.

Small-Pox.

The epidemic constitution of the air in its relation to small-pox, has frequently been the subject of inquiry, but at present we know little more than that, at certain periods, this loathsome scourge becomes capable of disseminating its invisible ferment with concentrated power—the air as it were, being for the time congenial to its life, and giving an impulse to its activity. Such has been the case in the present instance. Not only has this disease prevailed to a greater extent than was ever before known in its former epidemic visitations, but also with a virulence and malignity which is shown by its fatality. And in whatever phase of its development—for it assumed every known variety—it presented more or less of severity throughout its entire progress. Among the peculiarities observed was the tendency to assume a putrid diathesis—manifested in petechiæ, vibices and hemorrhages from various parts of the body. The pustules, instead of their

characteristic form sometimes remained flat, and coalescing into each other, became red, purple, or blue, resembling the *variola nigra* of Sydenham and the *bloody small-pox* of Mead. These appearances were always followed by a fatal result. They were more frequently met with in San Francisco than in Sacramento. There were two strongly marked cases seen by me here, however; one in consultation with Dr. Simmons, the other at the Small-Pox Hospital, both terminating fatally on the third day of the eruption. The little protuberances like small shot, felt under the cuticle, served to distinguish these cases from purpura or petechial affections. About the last of May small-pox made a sudden irruption, and during June manifested its epidemic tendency in San Francisco, by swelling the mortuary list from 218 in May to 275 in June; twenty deaths having been caused by it. Although no case occurred in Sacramento until about the middle of June, still the influence was sensibly felt in the increase of the mortality here from all other diseases—the number of deaths for June being 56—an increase of 29 over that of May. I would here remark that the first case in Sacramento, which is reported by Dr. Phelan, possesses peculiar interest from the fact that the patient did not fall sick until three weeks after his arrival here from San Francisco; consequently the period of incubation may be put down as at least 21 days. This is, I believe, the maximum limit allowed for the latency of the infection.

The following comparative statement will readily show the progress and results of the pestilence from June, 1868, to February, 1869.

DEATHS IN SAN FRANCISCO.

1868.	Small-Pox.	All other Diseases.	Total
June,	20	255	275
July,	19	327	346
Aug.,	62	255	317
Sept.,	71	279	350
Oct.,	70	264	334
Nov.,	97	314	411
Dec.,	148	353	501
1869.			
Jan.,	97	283	380
Total	584	2330	2914

DEATHS IN SACRAMENTO.

1868.	Small-Pox.	All other Diseases.	Total
June,	0	56	56
July,	0	58	58
Aug.,	0	42	42
Sept.,	1	32	33
Oct.,	4	32	36
Nov.,	6	47	53
Dec.,	7	32	39
1869.			
Jan.,	8	41	49
Total	26	340	366

It will be seen that the relative mortality of small-pox to all other diseases in Sacramento is about as 1 to 13, nearly 8 per cent., and to the entire mortality as 1 to 14, or about 7 per cent., which is much less than in San Francisco, where it is as 1 to 4, or 25 per cent. to all other diseases, and 1 to 5, or 20 per cent. to the entire mortality. It will also be seen that the entire mortality was, at the same time, proportionately more enhanced in the former city, especially at the inception of the pestilence ; while the remarkable fact is demonstrable from the same source, that the proportion of deaths to the population in Sacramento being 1 to every 54 inhabitants, is far more favorable in a general sanitary point of view, than in San Francisco where it is as 1 to every 41. I shall also soon show that the result as to cases was greatly in favor of Sacramento.

In order to afford some positive idea of the excessive malignancy of this epidemic in spite of our modern prophylactic, I will here state that in England, prior to 1800, *i. e.* prior to the period when vaccination influenced the results, the deaths by small-pox were to the total deaths, as 16 to 100, or about 6 per cent. In Philadelphia, from the years 1807 to 1811 inclusive, variolous inoculation being then extensively practised, the deaths by small-pox were, to the entire mortality, as 1 to 25, or 4 per cent.* Prior to the introduction of vaccination, the average mortality is usually stated to have been 1 in 4 of those attacked, or 25 per cent. In Germany, it is stated by Heim to be 20 per cent. Let us see what has been the result here. Thus far (Feb. 1st, 1869,) there have been in all 78 cases in Sacramento ; 47 of these were treated in private practice, and 42 in the hospital. Of the former, 15 terminated fatally ; of the latter, 11 :—total number of deaths, 26—a per centage of $33\frac{1}{3}$, or 1 death to every 3 cases. The proportion of deaths at the hospital was about 1 in 4, or 25 per cent., making comparatively a better showing for the

* Condie on Diseases of Children, Philadelphia.

hospital than for private practice. While these facts speak loudly in praise of my predecessors, Drs. Blackwood and Haswell, as Physicians to the "Small-Pox Hospital," a most frightful degree of fatality is revealed. But great as has been the fatality here, I apprehend it has been still greater in San Francisco. In the "PACIFIC MEDICAL AND SURGICAL JOURNAL" I find that the number of cases of small-pox reported for the four weeks in December, 1868, is 370, divided as follows: first week 90 cases, with 48 deaths; second week 94 cases, with 31 deaths; third week 102 cases, with 35 deaths; and fourth week 84 cases, with 30 deaths. This shows a fatality of nearly 1 death to every $2\frac{1}{2}$ cases of small-pox, or 40 per cent., which is almost unprecedented in the annals of this disease. It would seem therefore, either that this has proved the most malignant epidemic on record, or that the protection afforded by vaccination has been wanting. Both these conclusions are perhaps correct. The enhancement of the mortality of all other diseases as well as the increase of the death-rate, to which I have already alluded as superinduced by the widespread *pestilential* constitution of the atmosphere, on which the diffusion of small-pox depends, attests the malignancy of the type; while the large proportion of deaths that have occurred, especially in children and in a certain class of the floating population of California, particularly of Mexican, South American or Californian nativity, shows that the extensive prevalence of small-pox in our midst is not due to failure of the anti-variolous power claimed for vaccination, but to the neglect or absence of its protective influence. It is a well known fact admitted by the highest authorities, that a death from small-pox in a vaccinated child is a very rare event. Dr. Gregory declared in a discussion before the Royal Medical and Chirurgical Society, that cases of small-pox after vaccination up to the 15th year seldom or never occurred. Had the children, therefore, who have fallen victims to this direful scourge been vaccinated, they would not have aided to swell our bills of mortality to their pro-

digious dimensions. But let us turn to facts. On examination of the records of our Board of Health, I find that of the 26 deaths by small-pox in Sacramento, up to the 1st of February, nine were under 15 years of age, and six more besides were of either Californian, Mexican or South American nativity; and hence we see that nearly two-thirds were in all probability never vaccinated. I have not access at present to the records of the Health Office in San Francisco, but in the September number of the "PACIFIC MEDICAL AND SURGICAL JOURNAL," I find the following statement of cases and deaths for five weeks during the early part of the epidemic, *i. e.* from the 8th to the 12th week of its irruption, beginning with July 19th, viz.: 8th week, 65; 9th week, 32; 10th week, 28; 11th week, 38; 12th week, 32: or 195 cases for the five weeks. Of these 55 were born in California, 40 in other portions of the United States; 31 were natives of one or other of the German States, only 5 were born in Ireland, 9 were from China, and 55 of various foreign or unascertained nativities. Of the 60 deaths that occurred in these cases, 21 were natives of California, (all but two of San Francisco,) 13 of other United States, 5 of Germany, 1 of Ireland, 6 of China, and 11 either of foreign or unascertained birth. From this showing it appears that about one half of these cases and deaths were of Californian or unascertained nativity, and hence were either children, or Mexicans, or South Americans, or Indians, and in all probability were never vaccinated. In fact, the authority from which I quote, adds, "a very large number of the cases were among the native-born—many of them being children probably unvaccinated, as this means of protection has been heretofore much neglected. Some effort was made to ascertain whether these cases had been vaccinated, but the information gained is so meagre as to be valueless. We learn that of the *nine*, in a family of *ten*, who had small-pox at the same time, none have died."

I remember of these cases being reported to the Medical Society when I was in San Francisco, by Dr. Haine; and if

my memory holds good, they were all children except one, and none had been vaccinated.

The occurrence of such a persistently malignant visitation of small-pox at this period of our medical history, is a subject replete with interest to the professional inquirer, and of vast importance to the well being of society. Its importance is manifested when we consider that the number of deaths from its appearance in June last to 1st of Feb., 1869, was, in San Francisco 584, and this from a disease that is supposed to be more under the control of our art than any other of equal gravity. It would seem, therefore, notwithstanding what has been achieved by vaccination, that small-pox is still the most formidable disease to which humanity is subject; and judging from the frequency of its recurrence in California—this being the third epidemic outbreak since the American occupation—there is some peculiar, but as yet inscrutable condition of the climate which favors its development; probably the same causes which predispose to and excite in such a remarkable degree, all the exanthematous affections. That its virulence this year is attributable to the same *pandemic* influence, which has spread suffering and devastation—as we have seen—over the surface of the whole earth, cannot be questioned; and that it may never prevail again with such malignant and stubborn tenacity, is also highly probable. Nevertheless, inasmuch as a certain proclivity to its recurrence has been manifested in California, we cannot too carefully provide against the causes that have, almost to an absolute demonstration, conduced to its recent extensive prevalence.

I have already alluded to its primary and chief cause—inattention to vaccination. This, unfortunately, too often has resulted from apathy, or prejudice of some who, without sufficient examination of the facts, regard it as an insufficient safeguard.

A second cause of the extensive prevalence of small-pox is imperfect vaccination. This may be produced by a variety of causes—as not observing the regular progress of the disease, or from injury to the vesicle. It may also be connected with the diseased condition of the recipient; or other diseases may modify the action of the vaccine virus. An experience derived from connection with my father, who was for 44 years Physician to the extensive Orphan Asylum at Charleston, S. C., enables me to speak authoritatively, in stating, that the lymph used for vaccination ought to be taken fresh from the arm of a healthy infant on the 8th day, and ingrafted *directly* upon the arm about to be vaccinated—"arm to arm" vaccination, as it is called. A perfectly *typical*, umbilicated vesicle should be selected while the lymph is yet clear, and before the vascular zone has reached its full development. Bad vaccination, as it prevails at present, is almost always "directly dependent on the careless employment of improperly preserved dry lymph, and indirectly associated with irregularity of inspection."*

Upon the subject of vaccination, the following are the conclusions which I would advance, and which are sustained by Mr. Marson, Resident Surgeon of the London Small-Pox Hospital.

1st. That vaccination performed in infancy, afforded almost complete protection against the fatality of small-pox to the period of puberty.

2d. That as a matter of safety, it would be well for all persons who were vaccinated in infancy to be re-vaccinated at puberty; this measure being more especially requisite for those who were either indifferently or doubtfully vaccinated in infancy, and still more necessary for those who, though vaccinated, have no cicatrix remaining, or if remain-

* Sanderson, in Public Health Report, 1861.

ing, do not present the characteristic punctuations and thimble-like marks. Finally, as a matter of precaution, it would be desirable that all persons should be re-vaccinated, on small-pox existing in the house in which they are residing.

Concluding Remarks.

An experience verified in every epidemic of small-pox, from the time of Rhazes, seems to establish the fact that the disease is most *fatal* during rainy weather, and in California as we well know, it is *then* most *prevalent.* In comparing its progress with other zymotic diseases, we are struck with its equable course. Never mounting up suddenly to the topmost crest of the disease-wave like cholera, to sink into the gulf as suddenly, small-pox pursues its own peculiar way, rising and falling like the undulations of the sea. In tracing the progress of the epidemic that commenced in 1667, I find from the writings of Sydenham, that it began to show itself in England at the approach of the vernal equinox, and from that time until Autumn it increased daily; as the winter approached, its vigor declined; with the beginning of the ensuing spring it again spread itself, until, as in the year before, it became restrained by the frosts of winter. After this it renewed its vigor a third time and finally died away in the month of August, making way for an epidemic dysentery. I have already alluded to the cholera of 1849 being preceded by the small-pox in England, and it would not be a cause of surprise to me if the present epidemic was succeeded by the same or some other pestilence. The large proportion that the severe have borne to the mild cases, is a subject which is well worthy the consideration of this Society; likewise the ratio of fatality in the confluent cases. It would also be interesting to ascertain the power of vaccination in altering the proportion of severe to mild cases. This can only be done by an interchange of the experience of the members, when each one is called upon in rotation, according to the By-Laws of this

Society, to express his views in relation to the essay of the evening. From the tables of Mr. Marson, exhibiting the comparative mortality of the several varieties of normal and abnormal small-pox, during the epidemic of 1838, the power of vaccination in altering the proportion of severe to mild cases, was remarkably exhibited. Among 396 unprotected cases, there were only 23 which were mild in their aspect, while out of 298 vaccinated subjects, there were no less than 134 which presented at the outset favorable appearances, independent of 66 which displayed modifications during the maturative stage. The actual extent of security against small-pox enjoyed by vaccinated compared with unvaccinated persons, has been calculated from extensive tables by Simon, who found that the death-rate amongst the vaccinated varied from an inappreciably small mortality to 12½ per cent., whilst amongst the unvaccinated it ranged from 14½ to 53 4-5 per cent. Thus it would appear that, excessive as has been shown to be the mortality from the present epidemic, it might have been still greater had not diligent and indefatigable measures been adopted to check and arrest its destructive course by a general resort to vaccination and re-vaccination. It is only when compared with the mortality of former small-pox epidemics, that the present looms up into its startling proportions. In the epidemic of the winter of 1852–3, some 300 cases occurred in this City, and the mortality as estimated by Drs. Harkness and Montgomery who were at that time physicians to the pest house, and who had the best opportunity of forming a correct judgment, was 7 per cent. The next epidemic of small-pox occurred in the winter of 1861–2. Prior to the organization of our present Board of Health on the 17th March, 1862, it was found impossible to determine accurately the number of cases; but from that date to the 2d of April, when the disease died out, 71 cases were reported, viz.: 30 of varioloid, 30 of distinct small-pox, and 11 of confluent character. Of the whole number only two proved fatal. The mild type of these former epidemics points to some extraordinary malignant influence operating upon the

ordinary predisposing causes of the present loathsome scourge. I have only one remark more to make before closing this, I fear, already tiresome paper. In former reports I have alluded to the comparative exemption of our Chinese population. Surely if crowding together of human habitations and want of cleanliness be predisposing causes of the disease, here amongst this filthy people we should expect to find this malady in all its virulent features. I have again to record the almost complete immunity of the Chinese from the present epidemic. Can it be that the method practised amongst this ancient race from time immemorial, of sowing or disseminating the disease by introducing the powdered scabs of the eruption into the nostrils, is more effective than the boasted discovery of our canonized Jenner? If so, let us learn wisdom from olden traditions, and devoting offerings to the "Goddess of Spots," —the divinity who first hinted at inoculation—invoke her mythical and long despised aid.

[Note.—In commuting the death-rate in San Francisco, I have estimated the population at 120,000, which is probably too low a figure. On this subject the editors of the *Pacific Medical and Surgical Journal* remark: According to Langley's Directory, it was 147,950 about the middle of the year 1868. Besides the natural increase since that time, it must be considered that there is always a large influx of transient population during the winter season, so that the City contained not far from 160,000 inhabitants at the period of the greatest mortality from small-pox and other diseases. Comparing the mortality of these two cities with the data in mind, it is not likely that there is any material difference in favor of Sacramento, in a sanitary point of view.]