

# Personalities of Professors Loeb and Mathews

**A** FEW days ago it was announced that two men, one a German born, the other a native of America, had together solved the secret of nerve and muscle stimulus, and immediately the names of Jacques and Albert Mathews were placed in heavy display type in every large newspaper in the country, and under various headings was given the story of their investigations and prophecies as to what these discoveries would mean to the world. Now, it is a good thing for the public to applaud, even though not one in a thousand understands what are ions, electrons, protoplasmic energy, parthenogenesis, or other similar terms in which the experiments of these scientists are described. We have been told that the discoveries prove our physical energy to be due to electricity and not to heat, that thus is explained the beating of the heart, the effects of drugs, and that we have taken a step toward the solution of the problem of life and death. We realize somewhat vaguely, but none the less surely, that all this means a wonderful achievement has been made. And so, though we may not come within intellectual hailing distance of the discovery, we are prepared to laud the men who have placed America on an equal plane with Europe in the domain of pure science. For this is what Profs. Loeb and Mathews have done.

## Loeb Is a Young Man.

The first meeting with Prof. Loeb is a surprise. One expects to see an elderly, pale, heavy-browed devotee of the midnight oil. Instead one sees a man who looks barely 30, springy of step and quick to the degree of nervousness in his actions.

Then, when one recalls the chronological record which places him at nearly 40, the first thought is that he has found in his investigations some elixir of life which he is using himself and had not let the world know about it. We have a way of jumping to the conclusion that, if he has prolonged the life of a single cell, he may have found the way to prolong the life of some countless number of cells which make up human life. No one is quicker, however, to discountenance such a generalization than Prof. Loeb.

"Maybe, in years to come," he said to me, "we shall know what life is and be able to control it, but not now, not yet."

For an investigator who has accomplished a long stride toward the great unknowable, Prof. Loeb is exceedingly modest.

"The most that anyone can do," he says, "is to add a single drop to the sea of human knowledge. I am not at all sure that I have done that. It remains for the future to show. The longer I live the more I realize that ephemeral fame counts for nothing. If the few men who really understand what I am trying to do recognize my work as good, then I shall be satisfied."

## Studied for Years.

Prof. Loeb has been connected with Chicago university for several years, but for many years before his coming to this country he had been working on the physiological problems of life. Born in a small German village and educated in Berlin university are the only two facts in his early life which he has made public. "My work must speak for me after that," he replies to questions for details. There is, indeed, enough in his work to speak

volumes. Not content with anything less than original investigation he began by studying the lowest form of animal life and shortly discovered that these beings were attracted or repelled by light, heat, gravity and various chemical substances. He was not ready for the generalization that, since these forms of energy were electrical in nature, all life force was stimulated electrically. But he went on, and at the Naples laboratory and at Wood's hall in Massachusetts he found that he could stimulate chemically the life of sea urchin eggs. Then came his investigations into the secret of muscle stimulus. He was progressing toward the problem of life and death.

At just the right time along came a young man who had been studying physiological problems all his life. His mind was not confused with the difficulties which Prof. Loeb saw, because he had not gone through with the same experiments. "I had reached a certain point in my investigations and was looking one way when I should have looked another. Prof. Mathews came along, saw what I was doing and looked in the direction I had missed."

The result was the discovery of nerve stimulus and the co-operation of the two theories into a practical generalization.

## Mathews Also Young.

Prof. Mathews was born in Chicago thirty years ago, just after the great fire which swept the city up to within two blocks of the Mathews home. His father now the well known musical critic and editor of a magazine of music published in Chicago, was at that time a member of the fire patrol which saved what little

was left of the city. Young Mathews received his first training under Prof. Beltwood in the Evanston High school, who was then considered the greatest educator in the west. When Mathews went east for college he was asked what education he had.

"High school," he replied.

"Where?"

"In Illinois."

"Humph, there are only two high schools in Illinois," replied the examiner, "Princeton and Evanston."

"Yes, and I came from one of them," replied Mathews triumphantly.

As a matter of fact Prof. Beltwood established the high school at Princeton and then moved to Evanston.

## Under Special Dispensation.

Albert Mathews was the best student in Beltwood ever turned out. At the Massachusetts Institute of Technology the boy was denied admission because he was too young. The following year he applied for admission again, but a special dispensation of the authorities gave him entrance. Throughout his course there he distinguished himself beyond previous record. He was a scholarship student and had come down to study electricity, but got into biology instead. Prof. Sedgwick took a liking for the young man and they did a great deal of original research work together. One very practical result of their association was the tracing down of the cause of the New England diphtheria so prevalent at the time to the milk which came down from the Merrimac country. The following summer Mathews went about New England examining water supplies, wells and town

pumps. Many of these latter he found full of germs and he had them closed up.

## His Course of Study.

In 1892 he was graduated from the Technology institute, and then followed a fellowship for two years at Columbia, two years in Marburg university, Germany, a summer in the International Marine and Biological Station at Naples, another term at Columbia, two years as professor of physiology at Tufts college and a year in Harvard. He went to Chicago university last September. It was in Germany that he began his experiments. There he worked with Kossul and other eminent physiologists and took up his investigations first in the analysis of albumen. At Naples he tried experiments similar to those of Prof. Loeb, but with less successful results at the time. At Tufts he organized the department of physiological chemistry and at Harvard he carried on more original experiments. He has been going to Wood's Hall every summer—except those when he was abroad since he was a student in the Institute of Technology. During late years he has been one of the principal lecturers at the summer school there and it was at this place where the greater part of his work on nerve stimulus was done. Here also Prof. Loeb carried on his experiments and the two men worked together for some time. At present both are closely associated, and, while Prof. Loeb's work is more exhaustive and complete, that of his younger colleague, Prof. Mathews, is none the less of considerable importance. Together they are working on the further problems which their discoveries have opened up.

HERBERT WALLACE.

# Snap Shots on City Streets During Snow Storm



ORGAN GRINDER WELCOMES SNOW, FOR IT HELPS HIS BUSINESS



SWEEPING THE TROLLEY CAR TRACKS.



HIS DRIVER IS SNUGLY ENSCONCED IN A WARM ROOM.

# Rude King Blizzard and His Relentless Assertion of Power

(Copyright, 1902, by E. B. Dunn.)

**W**HILE "Old Boreas" sleeps in the heart of the icy north, industry and commerce move steadily on. Nothing, it would seem, could check this progress and demean the power of man. But in the frozen north there is often at this season an awakening of "Old Boreas" from his slumbers, and then he sends forth a blast that shrivels man and beast, demoralizes industries, obstructs the traffic of a continent and cuts off communication with the outer world. It is the "blizzard," and man is suddenly brought to realize its mighty power.

The blizzard, as defined, is a fierce wind, accompanied by a fine, cutting, drifting snow and intense cold. The term blizzard was formerly associated only with the winter conditions that usually prevail in the northwest, but is now used to designate similar storms in the eastern states. In the districts of the southwest and Texas such a storm is known as a "norther." When there is an absence of snow in these latter sections a fine, biting sand takes its place, and in many localities the blizzard is accompanied by both. The force and destructive character of the blizzard is demonstrated in many ways. Only recently the entire country east of the Rocky mountains and from Canada to the Gulf of Mexico was brought within the grasp of this mighty monster from the north; lives were lost on land and sea, cattle perished by the thousands on the western plains, rivers overflowed their banks, railroads were blocked, telegraphic communication

interrupted, and valuable gardens and fruit groves in the sunny south completely destroyed. South of the line of Georgia there was no snow, but the sweep of the high winds and cold was equally disastrous to that section.

**Where They Hatch.**

"Blizzards" find a birthplace to the north of the boundary line of the United States. The most severe and extensive enter the country over Montana or North Dakota. They occasionally come down over Minnesota or the Great Lakes. The latter, though they may be equally severe as those entering further to the westward, are smaller in diameter and they spread over the lake regions, Ohio valley, middle Atlantic and New England states only, while those coming from over the former states, as a general rule, spread over the entire country east of the Rocky mountains. They first move directly southward and, strange to say, while these storms of high winds and intense cold are the outcome of the development and movement of areas of abnormally high pressure (where the wind is thrown off from the center in all directions, with a motion similar to the movement of the hands of a watch), their full force is not attained until the centers are within the bounds of the northwest states, where the most intense cold of the journey is registered, and not infrequently touches from 50 to 60 degrees below zero. This feature is probably due to a more rapid nocturnal radiation than takes place further north.

The movement of an area of high pres-

sure, with the blizzard-features attending, depends more or less upon the cyclonic or low pressure area preceding it relative to its intensity, position and movement.

The atmospheric waves making up all storm movements follow one another, like the waves of the ocean, only on a more gigantic scale. There may be anywhere from one to five of these atmospheric waves traversing the country at the same time, but of different force and dimensions, each struggling to secure an equilibrium, those of the high waves endeavoring to fill the comparative vacuum of the low areas. In both instances they are propagated to the eastward by the rotation of the earth.

**High, Low and the Game.**

The existing low pressure, which forms a vacuum or channel of light air, offers an inducement for the flow of the heavier, colder air toward its center. Thus it will be seen that the colder air from the high pressure readily starts for the place of lowest pressure. It is like rolling a ball down hill; the steeper the incline the faster the ball will travel. The same with the wind; the greater the depth of the low pressure center the more rapid and greater will be the volume of cold air rushing to fill it. The cold air and strong winds circle to the west and finally to the south of the low pressure center and follow in its track across the country. The intensity of wind and cold is confined to the northern or northwestern sides of the low pressure or cyclonic center.

Should a preceding low pressure center in the lake regions be moving eastward

the cold winds will prevail principally in the lake regions and the northern part of the Atlantic states. If the low pressure area is in the central Mississippi valley the blizzard winds will sweep southward into the northern part of the southern states.

The blizzard rages with its greatest fury, however, sweeping the country from north to south and from east to west when the low pressure center is on the west gulf coast. The wind blows from the north or from the northwest with velocities ranging from thirty to sixty miles an hour, while the temperature in the northwest, and thence south over the central states to Texas, drops from 30 to 60 degrees in a few hours. The minimum temperatures in the Dakotas, Montana and Minnesota range from 10 to 50 degrees below zero, in the central west 6 to 20 below, and the limit of zero frequently reaches to the center of Texas and east to Georgia. At such times the line of freezing weather and killing frosts passes to the Gulf of Mexico from Texas and cuts across central Florida to the Atlantic ocean.

**Where Blizzards Bite Most.**

The wind or "blizzard" conditions following storms from the southwest is expended principally in the northwest, the southwest and lake regions and the cold is more intense in these districts and the southern states than it is in the middle Atlantic districts.

The greatest severity of a "blizzard" is felt in the middle Atlantic states when a storm of low pressure passes off the south

Atlantic coast or centers in this vicinity, as did the greatest "blizzard" in our history, that of March 12, 13 and 14, in the year 1888. On this occasion there was a union of two storms, one which came eastward from the north Pacific ocean to a point north of Lake Ontario, there connecting by a trough of low pressure with a secondary storm on the coast of North Carolina. These two, and what appeared to be moderate depressions, drew together on the Atlantic coast in a center reaching from Hatteras to Atlantic City. This happened on the night of March 11. By the morning of March 12 the storm center was just off the immediate coast of New York, its advance being retarded by an area of high pressure over the north Atlantic. At this point and time the storm was quite extensive, but diminished as the rotary power of the storm rapidly increased. Snow was falling thick and fast and was being driven about by the high winds into banks from ten to twenty feet high at some points. The temperature was constantly falling, until at 10 p. m. of the 12th it reached four above zero. The storm continued with unabated fury throughout the 13th and 14th. On the morning of the 15th it diminished and the storm center located on the coast of Nova Scotia.

For three days the wind blew a gale from the northwest, with a fine, cutting, drifting snow, and the temperature near zero. Never had such a storm been experienced. In New York many perished in the streets, the city was completely cut

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