

Anniversaries of Science

February 23, 1843.—Congress passed a bill appropriating \$30,000 for the Morse telegraph.

Let me not be misunderstood as appropriating to myself the credit of the many modifications of the telegraph that have since been made in every part of the world, because I claim the invention of the generic telegraph. I do not pretend that the mechanism of the first forms of the telegraph was not rude, and even uncouth when compared with the beautiful workmanship of the European ateliers, of the hundreds of accomplished mechanics who have brought to the work their incomparable ingenuity and skill. And yet I may appeal to the fact, generally acknowledged, that the essential features of the original invention have not been obliterated; they can be easily and distinctly traced through all the improvements made in the various parts by which the different processes of the art have been more easily performed, —S. F. B. Morse: from a paper given at the International Exposition, Paris, 1868.

February 24, 1468.—Johann Gutenberg died. He invented printing with movable type.

The development of free discussion in Europe during this age of fermentation was enormously stimulated by the appearance of printed books. It was the introduction of paper from the East that made practicable the long latent method of printing. It is still difficult to assign the honour of priority in the use of the simple expedient of printing for multiplying books. It is a trivial question that has been preposterously debated.

—H. G. Wells: *The Outline of History*.

March 1, 1813.—Michael Faraday was appointed assistant in the laboratory of the Royal Society, under Sir Humphrey Davy.

Great as is the debt which electrical science owes to Ampère, it is exceeded by its obligation to Faraday whose marvelous experimental skill and instinctive perception of the inner nature of phenomena are still the wonder and admiration of all men of science. At twenty-one years of age he was a journeyman bookbinder, who had educated himself in some degree by reading the books which he was given to bind. The *Encyclopedia Britannica* aroused his interest in science and he applied to Davy for employment in the Royal Institution. For a number of years, as Davy's assistant, his chief work was in chemistry; but Oersted's discovery turned his thoughts toward electricity and thereafter it was his principal field of work. In 1831 he made the capital discovery of the introduction of currents, which is not only of the most fundamental consequence to the theory of electromagnetism but is the foundation of the innumerable practical applications of electricity to the uses of man.

—H. A. Bumstead: in the *Development of the Sciences*.

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Tungsten weighs about as much as lead.

EVOLUTION

Anti-Evolution Fights Fail

The anti-evolution forces in the Arkansas Legislature, after getting their bill through the House of Representatives by the close vote of 50 to 47, encountered unlooked-for difficulty in the Senate, where the measure was tabled by an overwhelming aye-and-nay vote. There were two anti-evolution bills introduced in the House early in its session, but in view of the decisive action of the Senate against the first it is regarded as unlikely that any serious effort will be made to push the second. Arkansas is the fourth state to go on record this year as unwilling to interfere with the teaching of science, West Virginia, Missouri and New Hampshire having already disposed of bills introduced into their legislatures.

The idea of combating the teaching of evolution by repressive legislation seems to be losing popularity among the evangelical clergy of the South, until now considered its chief supporters. The Educational Association of the Methodist Episcopal Church, South, has gone on record during the past few days as opposing such legislation, and individual ministers and laymen of other sects have expressed themselves as in sympathy with this attitude.

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PHYSICS

Music from Radio Squeals

The squeals of a regenerative receiving radio set, so annoying to neighboring listeners, may be turned into music, for Dr. Raymond Morgan, of the University of Pennsylvania, has devised the oscillophone, a device which tames and tunes the radio squeals.

The source of the squeals in Dr. Morgan's apparatus was a five watt power radio tube, such as many modern radio sets use in the last stage of amplification. This tube was made to oscillate, or squeal, which was evident through the loud speaker connected to it. Then by operating keys, various "capacities" were placed in the tube circuit, changing the pitch from middle C of the piano to several higher notes. A tune can be played, the notes being peculiarly clear, because, unlike ordinary musical instruments, the sound waves vibrate in one way only. With a vibrating string, as in a piano, the note is not pure, because besides the principal note, it also emits vibrations which are multiples of the rate of vibration of the fundamental note.

The application of the device to radio was shown when the oscillating tube was connected to an aerial, without the loud speaker, and without any sounds from the transmitter, a nearby receiving set reproduced the music.

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ZOOLOGY

Singing Earthworms

If you ever hear earthworms singing, you need not conclude at once that you need either to be psychoanalyzed or to take the pledge. Earthworms do sing, according to a critical scientific witness, Dr. Rudolph Ruedemann, of the New York State Museum, who confirms by observations on the vocalizations of American earthworms the report of a saengerfest of German worms sent in by a Freiburg scientist, Prof. Mangold.

"It was first pointed out to me by Mrs. Ruedemann, on a sultry May evening, that the earthworms in our garden back of the house could be distinctly heard," says Dr. Ruedemann. "Being incredulous at first, I sat quietly on a chair until I also heard an exceedingly fine rasping noise all around me. It was a chorus of almost unbelievably small voices in the dark. To find out whether the little musicians were really earthworms, I got a flashlight and when the voices, after the quiet resulting from the disturbance of walking over the ground, were again in full chorus, turned the light upon a point close to me, from which I was sure a rasping sound arose. The light revealed a large earthworm, partly stretched out of its burrow. I spotted several more afterwards. We two have since heard the singing every year, always on warm spring evenings about and after dusk. Mrs. Ruedemann also heard it last spring about four o'clock in the afternoon on a warm May day after a rain, and then she could see the 'singing' worms all partly stretched out of their burrows."

Dr. Ruedemann is of the opinion that the worms produce the sound by dragging the exceedingly fine bristles under their bodies over some hard object at the edge of their burrows, fiddle-bow fashion. The German scientist disagrees with him, and thinks that the worms do their singing with their mouths, clicking them open and shut so rapidly as to produce a fine buzzing noise. An associate of Dr. Ruedemann's, S. C. Bishop, of the State Museum, intends to make a study of the matter this spring and if possible settle the question.

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