

# SCIENCE

[Entered at the Post-Office of New York, N. Y., as Second-Class Matter.]

A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES.

EIGHTH YEAR.  
VOL. XV. No. 371.

NEW YORK, MARCH 14, 1890.

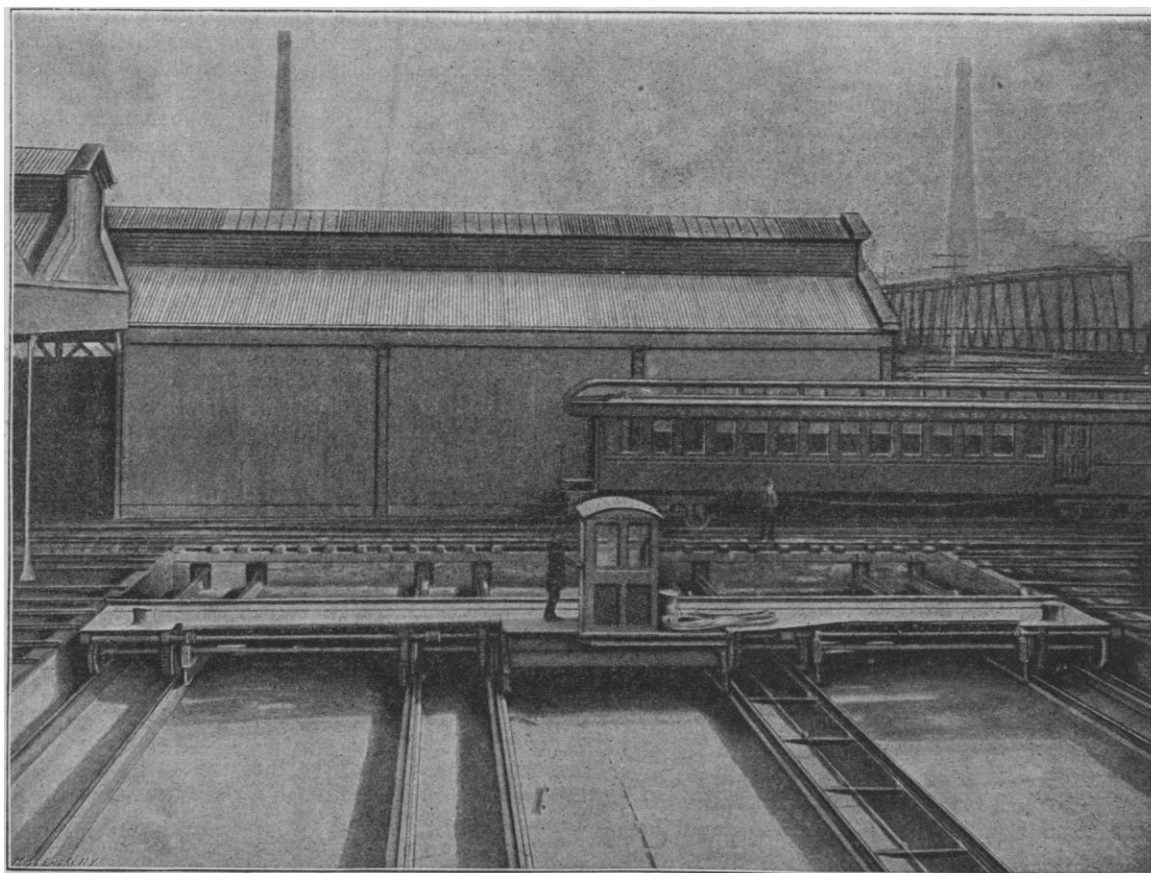
SINGLE COPIES, TEN CENTS.  
\$3.50 PER YEAR, IN ADVANCE.

## A NEW ELECTRIC TRANSFER-TABLE.

WE illustrate on this page an electric transfer-table, recently installed by the Sprague Electric Railway and Motor Company for the New York Central and Hudson River Railroad. This table differs from the earlier ones installed by the same company chiefly in the electric motor, which is of fifteen horsepower instead of seven and a half, and also in the contact arrangement. The contact is obtained from a couple of heavy copper wires stretched about three feet apart over the second of

Company, there is an overhead contact. The current used is only 220 volts, and hence, while not wholly pleasant to take in one's body, it is in no way dangerous. The current is taken from the same dynamo that furnishes light for the station. The full current capacity of the table-motor is 60 ampères.

The speed of the electric motor is governed by a switch, which throw the winding of the field into different combinations, thus altering the current, maintaining a practically constant strength of field without the use of any wasteful resist-



RAILROAD TRANSFER-TABLE OPERATED BY AN ELECTRIC MOTOR.

the four parallel tracks, the wire being carried on insulators fixed to light cast-iron cross-beams so as to be a few inches above the rails. The conductors are kept taut under all changes of temperature by springs at one end. Over these wires two contact rollers travel beneath the table, being kept in contact by gravity only. In the Altoona electric transfer-table, installed by the same company for the Chicago, Burlington, and Quincy Railroad, there is an outer contact maintained by springs, while at the Waukesha electric transfer-table, installed by the Sprague Company for the Wisconsin Central Railroad

ance. The control over the speed of the motor is perfect, and no complicated nest of gearing for changing speed is required.

The motor is supported at one end, according to the regular Sprague method, by double compression springs playing upon a bolt which rests upon the platform of the transfer-table. This method has been developed in street-railway work and other places where it is desirable to start slowly under a heavy load, and has proved very satisfactory. At the other end the motor is sleeved to a rigid support. By means of this flexible

attachment, all danger of stripping the gears is eliminated, and the strain upon the gears is always a progressive one.

The advantages of electric power for this work are claimed to be great. The equipment is very much lighter than if steam-power were used, and there is no expense of operation when the table is not in use. One man can easily handle the table, and more conveniently and directly than with steam.

The two end capstans shown on the table are fixed. The centre one is revolved in either direction by a simple clutch-gear. It is used, of course, for working cars on to or off the table without locomotive power.

The capacity of the table is 100,000 pounds. Ordinary car-axles, bearings, and wheels are used throughout for the running gear, and the total cost of the table and motor complete was under \$7,000. Its speed is about 150 feet per minute, the same as the old wire-rope table which it replaced. The old pit was lengthened somewhat, and accommodates ten tracks. The rails are carried on wooden longitudinals resting on small masonry foundation walls. The pit drains directly into the city sewers.

Electric transfer-tables have now been adopted by the Pennsylvania Railroad Company, the Philadelphia and Reading Railroad Company, the Chicago, Burlington, and Quincy Railroad Company, the Wisconsin Central Railroad Company, and other prominent corporations; and they are now recognized as an essential feature of every extensive and well-equipped railway switch-yard.

#### ASIA.<sup>1</sup>

ASIA, the birthplace of man, the mother of nations, is our theme to-night. Here are found the two great races of the world, — the Mongolian and Caucasian; here the great religions of the world had their origin, — the Jews, the Buddhists, the Christians, and Mohammedans. Here is the Pamir, the "roof of the world" or the steps to heaven, the abode of the gods; the centre of primeval tradition, as well as of modern theory regarding the primitive history of man. Here the Paradise of Adam has been most frequently located. Here is the lake from which the four rivers of the Garden of Eden diverge to the four quarters of the earth.

Beyond the Pamir, Alexander, the conqueror of the world, could not pass. Aristotle calls it the Mountain Parnassus, the greatest of all that exist towards the winter sunset, — the great snow mountains, which, in the morning and evening vapors, rise up opposite one like gem spires. This wonderful mountain-range is a series of high plateaus, running nearly north and south about 400 miles, and from 100 to 250 miles in width. These plateaus are covered with snow for nine months of the year. The lowest passes from east to west are from 12,000 to 15,000 feet in height, while all along the range numerous snow-peaks rise to 20,000 and even to 25,000 feet. The plateaus are inhabited only in the summer season, when the shepherds from Afghanistan and Turkestan on the west, and from China on the east, feed their flocks on the rich herbage.

The Pamir has been crossed at different times within the past five hundred years. Marco Polo was one of the early travellers; Bonvalot, a French traveller, one of the latest. Bonvalot chose the months of March and April to cross the Pamir, because there were no herdsmen to obstruct his progress. Many explorers have lost their lives in these wild inhospitable passes, and among the shepherds, more wild and inhospitable than the country.

From the Pamir high mountain-ranges run north-east, east, south-east, and south-west. From the north-east the Thian-Shan and Altai ranges of mountains run in an easterly and north-easterly direction for nearly 3,000 miles, separating Siberia from Mongolia. From Mongolia the range runs more northerly, passing through the eastern part of Siberia, forming the great divide between the waters of the Arctic and Pacific Oceans.

In Kamtchatka the mountains of the range become volcanic,

<sup>1</sup> Address delivered before the Geographic Society, Washington, D.C., Feb. 26, by its president, Hon. Gardiner G. Hubbard.

An edition of this address, with numerous additions, will be published in pamphlet form at an early date.

and are met by a range of volcanoes from Alaska. The combined range then turns and runs south, through Japan and the Philippine Islands, into Borneo. In this chain, miles in length, is the largest number of active volcanoes in the world.

From the middle of the Pamir the Kuen-lun Mountains run in an easterly direction 2,700 miles. They separate Mongolia from Thibet. From the central part of the Kuen-lun range, cross-ranges of mountains run southerly through Thibet, past the Himalayas, into and through the peninsula of Indo-China. In Thibet these cross-ridges maintain a normal elevation of 12,000 feet, with occasional passes nearly 17,000 feet high. From the south-east of the Pamir the Himalayas run in a continuous curve about 1,500 miles, with a width of 200 miles, separating Thibet from India. They are rightly named the "Abode of Snow," for through their entire length a mean elevation of 18,000 feet is maintained. Forty peaks have been measured which exceed 24,000 feet in height, while a few range from 26,000 to 29,000 feet. From the south-west of the Pamir the Hindu-Kush extend in a westerly and south-westerly direction through Afghanistan (with many peaks over 20,000 feet in height), connecting with other ranges which form the boundary between Persia and Turkestan, to the Caspian Sea; then around the south end of the Caspian Sea, culminating in Mount Ararat. A continuation of this range crosses Asia Minor to the southern coast of the Black Sea, and thence to the Bosphorus.

These ranges of mountains radiating from the Pamir are 10,000 to 12,000 miles in length. Along their whole course are snow-mountains and great glaciers. The Himalayas are supposed to be the highest mountains in the world, though none of these ranges have been thoroughly explored. These mountains, and the elevated plateaus on their sides, give Asia an average elevation of 1,650 feet, much higher than either of the other continents.

#### The Rivers of Asia.

These great chains are the source of the great rivers of Asia. In Siberia are the Irtish, Obi, Yenesei, and Lena. The Yenesei traverses in Siberia a territory which corresponds in length to the distance between the Gulf of Mexico and Lake Winnipeg.

The Amur is the only river of northern Asia that does not empty into the Arctic Ocean. Its general course is east; but, on passing wholly into Siberia, it turns and runs to the north, where its mouth is in inhospitable regions.

In China are the Hoang-Ho and the Yang-tse-kiang. They rise in the plateau of Thibet, near the Pamir. A great range of mountains running north and south obstructs their course, through which they force their way, and flow in an easterly direction, and empty into the Pacific Ocean; while the rivers of Indo-China, which rise in the same plateau close to these rivers, flow south into the Indian Ocean.

The Indus, and its main branch the Sutlej, rise on the north-western side of the Himalayas, follow the mountains several hundred miles, then find a way through the mountains in wonderful cañons. That of the Indus is said to be 14,000 feet in depth. Near the head waters of the Indus, another great river, the Sanpoor, rises, flowing in the opposite direction, and undoubtedly running into the Brahmaputra; but no traveller has followed the Sanpoor through the wild savage regions of lower Thibet to its mouth.

The waters from the south-eastern or Indian slopes of the Himalayas for 700 miles flow into the Ganges, which, near its mouth, unites with the Brahmaputra; while the waters from the west of the Himalayas flow into the Indus and its branches. Thus these two mighty rivers collect all the waters of the Himalayas, and discharge them into the Bay of Bengal through the many shifting mouths of the Ganges, or through the Indus into the Persian Gulf.

On the western sides of the Pamir, the great rivers of Turkestan, the Jaxartes, and Oxus, or the Syr-Daria and Amu-Daria, have their source, and flow through Turkestan into the Aral Sea. Numerous rivers rise in the Hindu-Kush, and run through the valleys of Afghanistan, but none of them reach the ocean: they are lost in the salt lakes or in the desert. The Tigris and Euphrates rise in the mountains on the coast of the Black Sea, run