

Correspondence.

Southern Storms.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of the 24th instant you print an interesting article on the great storm of September 26-27—the West Indian hurricane of that date. The enormous damage done at the same time to the timber, cotton, and other crops, as well as buildings in this State, was not due to this storm at all, but to another which blew from the opposite direction, i. e., northwest, as is shown by the thousands of trees broken, which all point to the southeast. There were two storms, one from southeast to northwest and the other from northwest to southeast, their edges meeting or overlapping about the eastern boundary of this State. Such occurrence must be very rare.

One result of the storm in this neighborhood has been the almost total extinction of the English sparrow, but unfortunately mocking birds, red birds, and others suffered in proportion. A large number of quail also have been killed.

J. WILMOTH.

Wortham, Miss., November 25, 1906.

Brain Anatomy.

To the Editor of the SCIENTIFIC AMERICAN:

The article "Wanted, Brains to Dissect," over the signature of James M. Boady, states "that the school of anatomists who follow Spitzka have inaugurated a new era in brain anatomy by calling attention to the important function of the great bundle of transverse fibers—the corpus callosum—as an index to the intelligence of the race or individual."

"Salvarona," a professor of psychology and author of the "Wisdom of Passion" and other publications, member of the Society of Psychological Research, etc., says "that it is not gray, red, yellow, or pink matter that has to do with it at all, but the spiritual, mental, and psychological substances, forces, and motions which operate through the brain matter, and a condition."

That the "Rolando" suture is the locality of muscular motion he learned from Prof. James of Harvard ten years ago, and that the frontal lobes of the brain are concerned in the higher intellectuality has been taught for decades. Both Boady and Spitzka, as well as the old anatomists who cling to the "gray matter," miss the point. It is the spiritual, mental, and psychological substances, forces, and motion, which operate through brain matter.

DR. JAMES B. CANDY.

Langhorne, Pa., November 12, 1906.

Roads for Automobiles.

To the Editor of the SCIENTIFIC AMERICAN:

Your recent editorial article on the subject of "Roads for Automobiles" was read with much interest and profit.

Here in Kentucky, in Fayette County, of which Lexington is the county seat, are some very fine roads for motoring. These roads are the old turnpikes reconstructed within the last three or four years with the steam roller, using broken limestone for material with a top dressing of the finer screenings. Crude oil from the Kentucky Ragland fields is then applied, making a road almost entirely free from mud or dust. When first put on, the oil sticks to vehicles and clothing and is quite disagreeable, but after a few days' sunshine the road becomes about as smooth and clean as asphalt, and further injury to vehicles or clothing cannot be discovered, and the road surface is bound so firmly and compactly together that the wear of motor traffic seems negligible. So tough is this material that the suction of motor tires has no effect on it. One application of oil a year is sufficient to keep the road in excellent condition.

I believe there are no finer motor roads in America, and no doubt they could be profitably studied by engineers interested in the construction of such roads.

B. L. BANKS.

Richmond, Ky., November 7, 1906.

The Current Supplement.

In the effort to meet the present imperative demand for a satisfactory railway motor coach a rather large number of constructions have been developed. The latest of these, the Kobusch-Wagenhals steam motor coach is described in the opening article of the current SUPPLEMENT, No. 1616. The car is driven by steam. Count von Zeppelin, in a very thoughtful paper, gives his views on dirigible airships and enunciates the theory upon which the several craft which he has built have been designed. Major E. Stassano writes on the electro-thermal metallurgy of iron. Inasmuch as he is one of the foremost authorities on the subject, his essay will be read, no doubt, with interest. Mr. B. S. Bowditch contributes a pleasantly worded article on the Weed Fields, in which he describes those wonders of our meadows which are commonly passed unnoticed. Mr. Willard L. Case's article on gas as a source of power, is concluded. The scientific control of boiler furnaces is a means of obtaining a high factor of

efficiency and economy, is a necessity to which steam users are keenly alive. Although various devices have been designed for analyzing the gases in boiler flues to determine the quantity of CO₂ which they contain, none is more interesting than that which is described in the current SUPPLEMENT under the title "The Ados Automatic CO₂ Recorder." Sir Francis Galton writes on the measurement of resemblance and proposes a scientific apparatus for measuring the similarity between two human beings.

Thirty-six New Variable Stars.

In the course of the study, by Miss Leavitt, of the distribution of variable stars, the majority of the variables discovered have been fainter at maximum than the tenth magnitude. This is owing to the long exposure of the plates, taken with the 24-inch Bruce telescope, which have been used. Not only is the number of faint stars on these plates very great in proportion to that of stars brighter than the tenth magnitude, but the discovery of variations among the brighter stars is, perhaps, disproportionately small because their images are so large that only striking variations are noticeable. Since the beginning of this work, it has been felt that the plates taken with the one-inch Cooke lens, which cover a region of the sky 30 deg. square and show stars of the eleventh magnitude and brighter, would furnish a valuable means of discovering the brighter variables. In January, 1905, four of these plates, having centers in R.A. 16h., Dec. 45 deg., were superposed. The positive used was very dense, and not well suited for the purpose of discovering variables, for which a thin positive is now always used. The six known variables RS Librae, RU Librae, RZ Scorpii, RS Scorpii, RR Scorpii, and RW Scorpii were rediscovered, however, together with the planet Uranus. No new variables were found, and owing to the pressure of other work, the examination of plates belonging to the map of the sky was only recently resumed. The region selected was that covered by a plate which has its center in R.A. 12h., Dec. 60 deg. The nebula in Carina and the "Coal-Sack," which had already been examined on Bruce plates of long exposure, are seen on these plates. Six photographs were compared, and thirty-six new variables were discovered, besides Nova Velorum, announced. The sixteen known variables, S. Carinae, RX Carinae, U Carinae, RS Centauri, W Centauri, R Crucis, R Muscae, S Crucis, RV Centauri, 131,360, 102,458, 103,260, 104,057a, 104,758, 105,160 and 125,564 were rediscovered, the last six having been originally found on Bruce plates and recently announced. In the entire region, within 15 deg. of the center of the plates, there are twenty-five known variables brighter, at maximum, than the tenth magnitude, omitting γ Carinae, the suspected variable T Carinae, Nova (RS) Carinae, Nova Velorum, and RT Carinae which is too much involved in the nebula to be found by this method. The nine variables which might be found on these plates but were not rediscovered, are Z Carinae, Y Carinae, RZ Carinae, S. Muscae, T Crucis, U Centauri, 104,265, 130,656, and 130,763. It is believed that an examination of ten good plates of any region, suitably distributed as to time, may be regarded as thorough, though no examination can be exhaustive. It may be considered satisfactory, therefore, that on six plates, sixteen out of twenty-five known variables were rediscovered, while thirty-six new ones were found. This indicates that there may be from seventy to eighty variable stars in the region, which are brighter at maximum than the tenth magnitude.

To Our Subscribers.

We are at the close of another year—the sixty-first of the SCIENTIFIC AMERICAN's life. Since the subscription of many a subscriber expires, it will not be amiss to call attention to the fact that the sending of the paper will be discontinued if the subscription be not renewed. In order to avoid any interruption in the receipt of the paper, subscriptions should be renewed before the publication of the first issue of the new year. To those who are not familiar with the SUPPLEMENT, a word may not be out of place. The SUPPLEMENT contains articles too long for insertion in the SCIENTIFIC AMERICAN, as well as translations from foreign periodicals, the information contained in which would otherwise be inaccessible. By taking the SCIENTIFIC AMERICAN and SUPPLEMENT the subscriber receives the benefit of a reduction in the subscription price.

Dr. William Brooks Honored.

Dr. William R. Brooks, director of the Smith Observatory and professor of astronomy at Hobart College, has been awarded a medal and diploma by the Astronomical Society of Mexico for his discoveries of twenty-five comets. Besides many other prizes, this is the twelfth medal conferred upon Prof. Brooks. Among these were medals from the Astronomical Society of the Pacific, a special gold medal from the International Jury of the Columbian Exposition, and the Lalande prize medal from the Paris Academy of Sciences, bestowed, in the words of the award, "for numerous and brilliant astronomical discoveries."

CONTROLLING THE COLORADO RIVER AND SALTON SEA.

The recent announcement that the engineers had succeeded in November in damming up the break in the banks of the Colorado River, and the more recent dispatches from the west stating that the river has again broken through its banks and was flowing into the Imperial Valley, have concentrated public attention once more upon the stupendous struggle between the forces of nature and ingenuity and resourcefulness of man which the Salton Sea catastrophe has produced. The huge gap, several thousand feet wide, through which the Colorado for many months has been emptying its waters into the depression of the Salton sink, has finally been closed by a dam, whose construction and the methods adopted to facilitate rapidity in its erection form a story of the greatest interest.

The readers of the SCIENTIFIC AMERICAN have been made familiar with the conditions of the Salton Sea disaster in a series of articles which appeared in the spring of the present year. We now present some photographs, taken during and after the completion of the dam, which, with the accompanying diagrams, will serve to make the situation perfectly clear.

The great natural depression, known as the Salton sink, once formed a portion of the ocean bed. Proof of this is found in the vast deposits of salt, the harvesting of which forms, or did form before the present inundation, an important industry. The term "sink" has been given to all that portion of the Colorado desert which lies below sea level; the Salton Sea is that portion of the sink which is at present covered with water. Within a recent period, measured geologically, the sink formed a portion of the Gulf of California; but the Colorado River, which brings down annually enormous quantities of silt, in the course of time so greatly broadened and raised the delta at its mouth, that the Salton basin was eventually cut off from the sea by a mass of silt, which now extends to a height, in places, of 40 feet above sea level. With the shutting out of the sea the inclosed waters of the Salton Sink gradually evaporated, until, in the course of ages, it had been reduced to its present dimensions, or rather the dimensions it had before the recent inundations commenced.

The alluvial deposits of the Imperial Valley are found to be, when irrigated, exceedingly fertile, and the present trouble has grown out of the efforts which were made to lead a portion of the waters of the Colorado River into the Imperial Valley for purposes of irrigation. In 1901 these operations were started by the dredging out of about ten miles of the channel of the Alamo River, which is shown on the accompanying map of the district, as running from the main stream of the Colorado in a general westerly direction. The canals and its waterways embrace about 100,000 acres of land; and so productive have the irrigated lands proved to be that there are at present about 12,000 people residing in the district, which is covered with prosperous farms. The mouth of the diversion channel, however, became so choked up in the course of time by silt brought down by the Colorado River, that, in preference to dredging out the canal, the irrigating company excavated a new channel from the river to the canal at the point marked on the accompanying map "Intake No. 3." This work was completed in November, 1904. The original ditch was about 50 feet in width, but the rush of waters due to a flood of the Colorado quickly cut a wider and deeper channel, with the result that more water flowed into the canal than could be used in the irrigation system, and the surplus, following the Alamo channel, flowed on into the Salton sink, which began to rise and spread out over the adjacent country. At times the increase in the depth of the Salton Sea has been as high as 3 inches in twenty-four hours. The salt industry has been practically ruined, and the irrigated district threatened with overflow. The maximum depth of water in the sink has been about 78 feet, but the basin would have to be filled to a maximum depth of about 150 feet before the water would cover the farms of the Imperial Valley.

Referring again to the accompanying diagrams, intake No. 1 represents the point at which the original channel led out from the Colorado River. No. 2 was cut on the Mexican side of the boundary to conform with a provision of the Mexican charter to the irrigation company, and very little use has been made of it. Intake No. 3 is the emergency cut referred to above. In May, 1905, channel No. 3 was about 100 feet in width, but when the flood waters subsided, it was found to have widened out to 800 feet and that the enormous quantity of 14,000 cubic feet of water per second was flowing through the gap, which, at one point had been cut out to a depth of 24 feet.

Among the emergency measures aiming to throw the river back into its proper channel, may be mentioned the following: First, an attempt was made by means of a light jetty of piling and brush reaching from A to B (diagram No. 1) to form a sand bar and divert the flow of the river to the eastern channel of the island. This proved to be a failure. Then the