Correspondence.

The Mississippi Jetties.—Letter from Captain Eads.

To the Editor of the Scientific American:

The following extract is from a private letter just received from Colonel W. Milnor Roberts. Believing it to be a well merited compliment, I cannot resist the desire to ask you make it public. As Mr. Corthell lately contributed to your valuable journal one of the most complete and intelligible descriptions of the construction of the jetties, and the principles upon which their application to the South Pass bar is based, that has yet been written*, I am sure you will cheerfully publish this handsome recognition of his ability, coming, as it does, spontaneously from one of the oldest and most eminent civil engineers in America, in praise of one who, though still young in the profession, has by hisindustry and talents largely aided in achieving the success thus far secured by the jetties.

MR. JAMES B. EADS, C. E.—*Dear Sir:* I have just returned from Philadelphia, from the annual convention of our society; and although pressed with an accumulation of various matters here, I must take time to congratulate you upon the grand success which your assistant, Mr. Corthell, achieved before the convention in his presentation of the operations and present status of the South Pass. It was clear, succinct, easily intelligible to those not familiar with the place, and delivered in a manner to impress every man with its truthfulness. It had, I think, a better and more potent influence, in clearing away doubts which existed in the minds of many who were present, than anything ever before presented.

Facts are stubborn things. I had prepared some remarks, chiefly based on the information I had received, some of which I gladly waived in the presence of the thing itself, so to speak, as shown to the convention by Mr. Corthell. If I say you could not have done it better yourself, I only say what I believe is true, and I know that you will understand my meaning. Yours, as ever, W. MILNOR ROBERTS.

I was unable to be present at the convention, but have heard from many others who were therethat Mr. Corthell's presentation of the subject was most admirable.

JAMES B. EADS.

The Long Gas Pipe in Pennsylvania.

To the Editor of the Scientific American:

In your issue of June 24, we notice an article, taken from the *American Manufacturer*, which, if left unexplained, would do us both injustice; and as neither of us wishes to be an iconoclast of "tables and books on pneumatics and hydraulics," we will endeavor to give a correct statement of the experiment of passing gas through a three inch pipe, 32 miles long, from Millerstown, Butler county, to Harmersville, Allegheny county, Pa. The time was computed by watches adjusted before the experiment and compared after it. The pressure at the well before the cock was opened stood at 55lbs.; after opening the cock, it stood at 50 lbs. throughout the day. At 32 minutes after the cock at the well was opened, we could smell the gas plainly at Harmerville, but it would not ignite for some time after. We had fixed at the discharge end of the pipe a 300 light meter; and by reducing the size of the opening so as to deliver 50,000 cubic feet in 24 hours, as registered by the meter, the pressure in the pipe increased to 34 lbs., and stood at that, being a loss of 16 lbs., delivering 50,000 cubic feet through 32 miles of three inch pipe; and by extending the same sized pipe to Pittsburgh (8 miles) the loss in pressure would equal 20 lbs.: and by increasing the opening so as to reduce the pressure to equal a column of water three inches high (the pressure required to lift the gas holders in our works), the delivery would equal 161,000 cubic feet in 24 hours.

This you will (we think) find is "in conformity with the theories and demonstrations of scientists," and it does not "look as though some facts would have to be changed or tables and books on pneumatics and hydraulics revised."

ROBERT YOUNG, JOHN MCELROY.
Engineers of Allegheny andPittsburgh Gas Companies.

The Voracity of Fishes.

To the Editor of the Scientific American:

In your issue of June 24, you give us an engraving of fish hooks, etc., found in the stomach of a cod, by Mr. Frank Buckland. Some of our southern streams contain voracious fish. An acquaintance of mine caught a catfish in a lake on the Arkansas River, near Little Rock, some few years since, from the stomach of which was taken the larger part of an ox liver, twenty-three hen's eggs, three puppies, and a child's shoe. Whether the fish had swallowed the child whole, and ithad been digested by the juices of the catfish's stomach, and the shoe alone remained to tell the child's sad fate, or whether the child escaped the jaws of the voracious fish, losing only its shoe in the *rencontre*, the evidence was not sufficiently clear to determine. But that the above enumerated articles were found in its stomach is undeniable; and I think this is enough to establish the fact that the catfish is also a voracious fish. ROBERT L. STEEL.

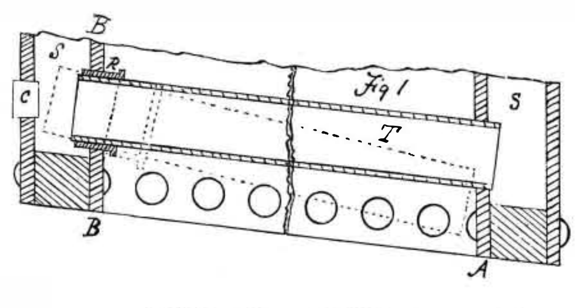
Rockingham, N. C.

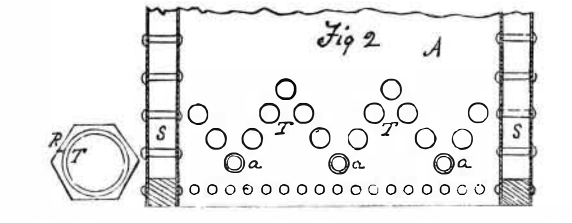
The Water Grate.

To the Editor of the Scientific American;

It would seem that a series of wrought iron tubes, placed side by side, three fourths of an inch apart, would form a most appropriate and economical grate for every kind of steam generator, and especially for the furnaces of coal-burning locomotives, wherein the solid bars are so quickly destroyed. The few roads which have used the tubular or water grate have proved it to be highly economical and satisfactory in every way, as far as I can learn: and there seems to be no reason why it shall not eventually supersede the solid grate everywhere and for every kind of fuel. The only care necessary in its use is to keep the tubes free from sediment.

*Published in SCIENTIFIC AMERICAN SUPPLEMENT, No. 21, May 20, 1876.





If the tubes, T, in the engraving, are sufficiently inclined, say from one to two inches to a foot, they will not clog, if they are of proper size, unless the water spaces around the furnace with which they communicate first become clogged. If the tubes are more than three feet long, they should not have less than two inches external and one and a half internal diameter. If more than six feet long, I would recommend not less than two and a half inches external and two inches internal diameter; and if more than four feet long, they should have a central support. An inch and a quarter screw plug, C, should be placed exactly opposite one end of each tube, for the purpose of cleaning the tubes in case they get foul. These plugs, in connection with the four two inch ones placed at the corners of the fire box, will afford ample opening for removing all filth which collects around the fire box and in the tubes.

There are several methods of fixing the tubes into the fire box; the best plan, all things considered, is to screw them into the front sheet, A, of the fire box and secure the other end in a copper or composition ring, R, screwed in the rear sheet, B, Fig. 1, about three inches of the rear end of the tube having been previously turned to a nice straight fit to the inside of the ring, so that the ring may be slipped on to the tube a little further than the position it is to occupy finally, in order to facilitate the entering of the screw end of the tube, as indicated by the dotted lines. After the tube and ring have been firmly screwed into the fire box, the corner of the ring may be set up to the tube with a steel set punch and a light hammer, to insure a steamtight junction between tube and ring. The holes for the reception of the tubes may be cut in the sheets before the fire box is riveted together; but the threading of the holes should be done afterward, and then it should be done with a tap having a stem long enough to extend across the fire box and rest in the hole opposite the one being tapped, in order to insure perfect parallelism of the tubes and rings while being screwed in, without any side strain.

The holes for the reception of the tubes are sometimes arranged zigzag across the sheets, as shown in Fig. 2, instead of in a straight line: the tubes, *a*, at the lower angle being movable, and not water tubes, to facilitate the cleaning out of the fire box. The Philadelphia and Reading Railroad, I think, first adopted this arrangement; some of their water grates are nine feet long. When the tubes are set in a straight line, a single movable tube will suffice for cleaning the fire box; this may be either the center one or one of the side tubes. It is desirable that these grates should be easily accessible from beneath, so that the fireman can see the state of the fire from below and carry the poker along between the bars and dislodge the ash and cinder without disturbing the fire above. To this end, there must of course be a door at the rear end of the ash pan.

Worcester Mass. F. G. WOODWARD.

[For the Scientific American.]

TECHNICAL EDUCATION IN THE UNITED STATES AS ILLUSTRATED AT THE CENTENNIAL.

The visitor who is interested in the methods of instruction adopted in this country can profitably spend a day at least in the examination of the educational exhibit at the Exposition. The writer, indeed, after a much longer study of these exhibits, finds his examination but partially completed. The chief point of interest to him, however, in this class, was the display made by several well known technical schools. The question as to the proper method of training engineers has excited great interest in professional circles of late, and numerous letters from your correspondents prove that information of these schools is desired by many of your readers. It is probable, therefore, that a few notes regarding the technical schools that are represented at the Exposition may not be unacceptable.

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

Taken as a whole, the Massachusetts educational exhibit may fairly challenge comparison with the display of any other State, and the completeness of the exhibit is nowhere better illustrated than in the technical department. Many exhibitors seem to think that they have accomplished their duty by making an interesting display, apparently forgetting that, if they cannot furnish printed descriptions or attendants to give explanations, the true merits of their exhibits will rarely be appreciated by the visitor. The Massachusetts Institute of Techology, however, provides complete catalogues of all articles exhibited, with documents explaining the organization of the school and various other details of interest. The general plan of the institution is quite extended, embracing ten courses, each occupying four years, as follows: Civil and topographical engineering, mechanical engineering, geology and mining engineering, building and architecture, chemistry, metallurgy, natural history, physics, science and literature, philosophy.

How these subjects are taught is illustrated by the work of the students, consisting of theses, examination papers, drawings, models constructed by students, accounts of experiments made by them, results of operations in the laboratories, plans and descriptions of buildings, and a good collection of the apparatus employed in making investigations. It is worthy of observation that this exhibit is not made up of the work of the best students only, but is designed to be a fair representation of that done by the whole school. The visitor who makes a careful examination of this display will see that the students are encouraged to make experiments and original investigations, and that a prominent place is given in most courses to the subject of drawing. It is pleasing to notice, too, that the majorityof the drawings aresuch as are required in actual practice, less attention being given to ornamental borders and titles than to the drawings themselves. Enough specimens of elaborate drawing are exhibited to show that the student can do this work if required. A fine illustration of this kind is a chart of the metric system, in which, however, it is to be regretted that the statement is made that all measures of the system, of length, surface, solidity, and capacity, are directly derived from the meter; for although this statement can be supported on the authority of United States law, it is none the less untrue as a scientific fact.

A hasty review of several of the theses shows exceptionally careful and thorough work on the part of the students. As is natural, in discussing doubtful questions, they are usually decided by reference to investigations at the Institute, which may not be generally regarded as possessing the authority of experiments made by other physicists; but taken as a whole, these theses contain much that can be read with profit by professional men and manufacturers. Occasionally, in glancing over the pages, some may regret that orthography was not embraced in the scientific course.

This institution opens its doors to members of the gentler sex, and it is pleasing to find an account of some thorough analytical work by one of the female graduates.

The school year is about 36 weeks, and the necessary expenses, including board and tuition, vary from $500 to $600 per school year, according to statements in the catalogues, the tuition fee being $200 per year. There are, however, several free courses of instruction. Much of the apparatus at the Massachusetts Institute of Technology is unusually interesting; and although some of the more novel features are not exhibited at the Exposition, they are fully described, and may be mentioned in a future letter.

WORCESTER COUNTY FREE INSTITUTE OF INDUSTRIAL SCIENCE.

The exhibit of this school is partly in the room adjoining that of the Massachusetts Institute of Technology, in the east gallery of the Main Building, and partly in Machinery Hall. The mechanical engineer will find much to interest him in this collection, which illustrates the results of a course of instruction, combining practical exercise in a well equipped machine shop with the technical training required by the thorough mechanic. A catalogue of the exhibits, drawings of the school, illustrative charts, and a compilation of various details are of great assistance to the visitor who wishes to make a thorough examination. The Worcester Institute has an annual income of $25,000. It was founded by John Boynton, and the machine shop was established by the late Hon. Ichabod Washburn. It has also received endowments from Hon. Stephen Salisbury and the State of Massachusetts. Tuition is free to all students from the county of Worcester, and also to 23 students from the State of Massachusetts, while to students from other localities the tuition fee is $100 per annum. The annual expenses, other than for tuition, need not exceed $300. The courses given embrace mechanical engineering, civil engineering, chemistry, physics, modern languages, and drawing. In professions where practical proficiency is required, it is imparted by practice. Mechanical students work for 5 months in the machine shop before entering the class rooms, and the subsequent course extends over a period of three years, in which 10 hours a week are devoted to practice in the machine shop for 10 months in the year, and 8 hours a day in the month of July. For other students, the course is 3 years. The work done in the machine shop consists of machine tools, models, and the drawing tables which are so well known. The manufactured articles are regularly sold in competition with those made in other establishments, and are readily disposed of. So far, the shop has not been established on a paying basis, the average annual excess of expenditures over profits being about $3,000. It is, of course, doubtful whether a shop conducted on this system can ever be made to pay expenses, if due regard is given to the other instruction required by the students, but this is a matter of minor importance. Numerous examples of the work of the students are displayed, including all their specialties; and having disregarded the request about touching the exhibits, the writer has become very favorably impressed with the general accuracy and the thoroughness of the execution. In Machinery Hall, which contains lathes, grinding machines, drawing tables, and models, manufactured at this school, one of the machine lathes is driven by a belt of twine, to illustrate the accuracy of the work. One of the most interesting exhibits of the school is the Willis apparatus for illustrating the principles of mechanism, with accounts of experiments made by students. In the case of a jack screw, it was found that the efficiency was but 23 per cent of the power applied, 77 per cent being required to overcome friction. With a crane, the efficiency was 67 per cent, and with a differential pulley, less than 32 per cent. The advantage of deriving a knowledge of simple machines from experiment rather than from a theoretical investigation, in which the enormous losses that occur in practice are ignored, is obvious.

THE STEVENS INSTITUTE OF TECHNOLOGY.

The visitor will find this exhibit near post T, 67, in the Main Building. It may be a matter of regret to some that so much of the display is devoted to the apparatus of the Institute and the work of its professors, and so little to what has been accomplished by the students, while the want of a catalogue or any method of gaining information will be seriously felt by the casual visitor. The exhibit is, however, of great interest, including a fine collection of the physical and mechanical apparatus of the school, much of which is unequaled, together with accounts of the results obtained by, and illustrations of the apparatus used in, the experiments of Professor Morton on fluorescence, of Professor Mayer on sound, and of Professor Thurston on the strength of materials. There are a few drawings by students which are exceptionally fine, but they are hung rather too high to allow of a close investigation. The engineer will doubtless be much interested in the elegant drawing of the governor invented by Professor Thurston, and equally so in the illustration of Professor MacCord's theodontoscope, for testing the accuracy with which the teeth of gear wheels are cut, by observing the velocity ratio of two teeth at different points of contact. The reader of the SCIENTIFIC AMERICAN SUPPLEMENT does not need to be assured that the Professor of Drawing at the Stevens Institute is one of the ablest instructors in the country; but it is questionable whether this school would not have done well to have made a more general exhibit of the drawings executed in ordinary course by the students.

The practical work of the senior class is illustrated by one of Professor Thurston's well known testing machines. By disregarding the printed request, and touching this exhibit, it will be observed that the construction is not as accurate as in some of the machines described above. The specialty of the Stevens Institute of Technology is thorough instruction in mechanical engineering. The course covers a period of 4 years, the school year consisting of about 35 weeks. The annual expenses are about $500, the tuition fee being $150 per year.

ILLINOIS INDUSTRIAL UNIVERSITY.

The display made by this institution will be found in the south gallery of the main building, among the educational exhibits of the State of Illinois. It consists of apparatus used in the school, models made by the students, records of some of their experiments in physics and the strength of materials, and drawings. One of the models, a flight of elliptical stairs, is an exceedingly creditable production. The specimens of machine work, being enclosed in a glass case, could not be examined very critically; but they do not appear to be as well finished as those exhibited by some of the other technical schools.

The Illinois university offers courses of instruction in agriculture, engineering, natural science, literature and science, military science, commerce, and domestic science and art, open to students of both sexes. In this instruction, practice plays an important part, and there is a machine shop in which articles are manufactured for the market. The catalogue of the university, which was given to visitors, was printed at the institution. It is perhaps only fair to say that this is not, in all respects, a first class piece of work. The complete course in any department requires 4 years, of 36 weeks each, and the annual expenses vary from $150 to $300, principally for living expenses, the tuition fees being merely nominal.

UNIVERSITY OF PENNSYLVANIA.

One of the alcoves in the Pennsylvania educational building is devoted to the display made by this university, which consists of drawings, text books, models, apparatus, and some examples of bridge trusses and gearing made by the students. It is not intended as a representative exhibit, visitors who are interested in the matter being referred to the university, which is located in Philadelphia, for further information. This university bids fair to become one of the most prominent technical schools in the country, being richly endowed, having spacious buildings, and an unusually fine collection of apparatus. One of the most important courses, that of mechanical engineering, has not yet been established, but it is probable that it will eventually form a very prominent department.

The above is a brief description of the exhibits of some of the more prominent technical schools of the United States. It will be observed that many well known schools are missing from the list; and it is a matter of regret that a full representation could not have been secured. The list might have been considerably extended by reference to the instruction in drawing and engineering, as illustrated in some of the general educational exhibits, but the limits of this letter will not permit such a wide range. The exhibits of foreign technical schools may form the subject of a future communication. R. H. B.

Philadelphia, Pa.

Brown, Purple, Green, and Yellow Ultramarine.

A Frenchman named Guimet has patented a new process for making ultramarine of these various colors. By the substitution of selenium for the sulphur in blue ultramarine, he obtains a brown and purple ultramarine. If in a similar manner tellurium be substituted for the sulphur, he obtains a green and yellow ultramarine.

Green and violet ultramarine are not new, having been in the market for some time. The method of manufacture has been kept a secret, and it is only through the careful analyses of Dollfus and Mieg that we have an insight into their composition. They analyzed three kinds, with the following results:

	Green.	Blue.	Violet.
Silica	37·770	37·860	22·305
Alumina	31·499	24·285	12·790
Oxide of iron	0·181	0·180	0·420
Soda	13·401	12·009	6·855
Potassa	0·480	0·000	0·000
Sulphuric acid	0·693	1·104	1·004
Sulphurous acid	0·405	0·780	0·764
Hyposulphurous acid	0·000	0·621	1·742
Sulphide of sodium	8·592	6·582	1·255
Free sulphur	3·310	7·929	3·188
Gypsum	trace	trace	41·814
Water	4·884	4·904	11·537
Kaolin	0·526	3·039	4·546

It is evident that the violet was adulterated with plaster of Paris. Although there is much similarity in their chemical composition, their structure must be quite unlike, as evinced by their action towards reagents. All three are decomposed by dilute acids, with an evolution of sulphuretted hydrogen and separation of sulphur. This reaction is slowest and weakest with the violet. When green ultramarine is decomposed with hydrochloric acid, great heat is evolved. Concentrated acetic acid, which does not attack lapis lazuli, does not attack blue ultramarine, but evolves gas from the violet and green. Oxalic acid slowly destroys the color of the green and blue, but rapidly decomposes the violet, with an evolution of sulphuretted hydrogen at first, then of sulphurous acid. A boiling solution of alum does not attack the violet, but readily attacks the green and blue. Ammonia, caustic soda, and potassa do not act upon the green and blue, but turn the violet blue. Fused nitrate of silver attacks all sorts and makes them white. Bromine dissolved in hydrochloric acid decolorizes them all. Concentrated nitric acid decolorizes all, with evolution of red fumes.

At a moderate temperature the violet changes to blue, and at a greater heat it turns white or pearl grey. Green resists the action of heat better than violet, but after a time it takes on a bluish green color, and at a very high temperature turns white. When heated with arsenious acid, the green remains unchanged, but the blue turns green, and sulphide of arsenic sublimes. Heating with zinc dust decolorizes all kinds of ultramarine.

Stevens Institute of Technology.--Commencement Exercises.

The second annual commencement of the Stevens Institute of Technology, N. J., took place on the evening of June 30. After a short and appropriate prayer by the Rev. S. B. Dod, President Henry Morton spoke substantially as follows: "The occasion which brings us together this evening is memorable in many respects. The present graduating class of 1876 commences its independent life at a time which coincides with the great celebration of the completion of the first century of our nation's existence. Two trains of thought are suggested by this coincidence. First, that much of our material prosperity is owing to the mechanical genius of our people, who, by the aid of labor-saving machines, have been able, at so early a period, to surround themselves with the comforts and elegances of life. This progress is due, directly or indirectly, to the mechanical engineers. Secondly, that our nation is no longer in its crude and vigorous youth, but needs men thoroughly trained and educated, if it is to keep up in the race of progress with the other nations. It is to 'Stevens '76' and such as them that we must look to make our next century as prosperous as the past. Finally, let us all, faculty, *alumni*, graduates, and students, adopt the sentiment uttered by one of that great class of '76 in Philadelphia, a hundred years ago: 'Let us all hang together,' although we are not, as they were, exposed to the danger of all "hanging separately" in case we fail."

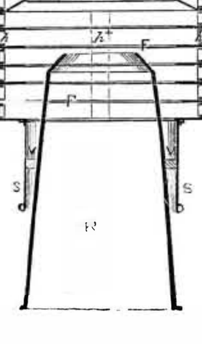
In the next place, the salutatory address was delivered by Edward B. Wall of the graduating class. Then followed abstracts of the theses: "Project for Erection of Two Blast Furnaces," by William Kent; "Transmission of Power by Wire Ropes," by Albert W. Stahl; "Manufacture of Illuminating Gas," by Alfred P. Trautwein; and "Theory of Windmills," by Alfred R. Wolff. These theses evinced considerable original work and research, the students having devoted several months to their preparation, during which they visited shops and factories, made experiments, and executed elaborate drawings. President Morton then introduced Mr. Reuleaux, Director of the Berlin Polytechnic Institute, and President of the German jurors of the mechanical section of the Centennial Exposition, as the representative of a sister institution.

Mr. Reuleaux spoke a few words in very good English, in which he begged permission to use his own language, the German. He spoke as follows: "In addressing you as the representative of an elder sister, as your President has kindly styled our Institute, I would have it understood that I do not feel as though I could claim any other advantages than those of age, but am proud to greet you as an equal. Our aims are essentially the same, to combine thorough practical instruction with the advancement of true science. The steam engine, which is the type of our profession, is not a mere mechanical contrivance, but the expression of an intellectual conception. It is, as it were, an enlargement of man's powers over nature, a continuation of his faculties. Its study, therefore, when conducted in the proper spirit, is an ennobling one, and deserves to go hand in hand with science for the amelioration of human society. I have visited this institution, and am rejoiced to see that its professors are imbued with a sense of their high vocation, which cannot fail to produce the happiest results. The scientific researches, moreover, which are here made, rank with the best that have ever been made anywhere." Mr. Reuleaux concluded with a few words of good wishes to the graduates and exhorted them to maintain the dignity of their profession. His speech, though in German, was well appreciated and elicited hearty applause. Mr. Dod, President of the Board of Trustees, then conferred upon the class the degree of Mechanical Engineer, and the exercises concluded with an impressive valedictory address by J. Mather Wallis.

The theses not already mentioned were on the following subjects: "Centrifugal Pumps," Samuel B. Brewer; "Designs for an Overhead Traversing Crane," John O. Buerk; "Pumping Engines," James M. Cremer; "Suspension Cables of Brooklyn Bridge," Gustavus C. Henning; Design for a Paper Mill," Joseph Kingsland; "Design for Iron Foundery," Philip E. Raqué; "Screw Propellers, Principles and Practice," Adam Riesenberger; "Apparatus for Extinguishing Fires," Eugene L. Vail; "Principles of Car Framing," Edward B. Wall; "The American Beam Engine," J. M. Wallis; "Construction of the Steam Hammer," Edward L. Wells; "Design for a Steam Dredge," William F. Zimmermann.

IMPROVED CHIMNEY COWL.

An automatic cowl for correcting smoky chimneys and ventilating buildings has been applied successfully to some public buildings in London. The action is continuous, and there is no mechanism to get out of order. The engraving shows a vertical section of the cowl. R is a truncated portion of tube which may be attached to the chimney pot. S is also a similar portion placed over the truncated tube, R.



The tubes or cones, R and S, are kept apart from each other by means of distance pieces, V. At the top of the tube, S, are placed a number of annular rings, superimposed, or perforated plates, F, separated from each other by means of distance pieces or blocks, *h*. Bands of metal —*h**, help to hold together the plates. These plates, F, are surmounted by a cap designed to prevent down drafts, which is constructed as follows: G* is a truncated conical cap, provided with upright supports, g^3, on the top of which is a flange or ring, *g**, so as to support a dome or door, G. Another conical cap or casing, G^3, is placed round the cap, G*, and rises above the flap or door, *g*. The outer conical casing, G^2, is secured to the upper most of the plates, F, by distance pieces or nuts. A free passage for the air is left between the inner and outer casings. Sometimes the door or dome is a fixture, but, when movable, a bent piece of metal, X, acting as a spring, closes it, after the brush or instrument used for cleaning or sweeping the chimney has been withdrawn. This dome or door, besides preventing down drafts, also prevents rain, snow, or other matters entering the chimney. The action of the ventilator is claimed to be that the constant movement of the atmosphere, passing transversely between the plates, F, withdraws all smoke, gas, and vitiated or noxious vapors.—*Building News.*

Centenarian Birds.

It may not be generally known, says the *Wexford Independent*, that the eagle, raven, and parrot are each centenarians. An eagle kept in Vienna died after a confinement of 114 years; and in an ancient oak still known as the raven tree, the same pair of ravens are believed to have fixed their residence for a series of more than 90 years. Swans upon the river Thames, about whose age there can be no mistake—since they are annually marked by the Vintner's Company, under whose keeping they have been for five centuries—have been known to survive 150 years and more. The melody of the dying swan is mythological. Upon approach of death the bird quits the water, sits down upon the bank, lays its head upon the ground, expands its wings a trifle, and expires, uttering no sound.

Corn Cobs.

One of our city exchanges, says the Ohio *Farmer*, objects to using corn cobs for fuel. They are too valuable. He recommends covering them with a plaster of oil, meal, bran, etc., and feeding to cows. The plan is fully equal to that suggested by a correspondent of another paper, to keep shade trees out of pastures to prevent cows from getting lazy. One cheats the poor brutes into eating that which is unnutricious and unpalatable, and the other forces them to eat by depriving them of shelter from the hot sun; at least, that is the intention.