of January, 1884, and especially clearing up many points wherein the technical journals, which had favorably reviewed its provisions, had erred.

Prof. E. J. Houston introduced Mr. Patrick B. Delaney of New York, who thereupon described in detail his lately invented system of synchronous-multiplex telegraphy, illustrating the same with the aid of detail-drawings and lantern-slides of essential portions of his apparatus. Mr. Delaney's system, as thus far perfected, permits of the sending of seventy-two separate and distinct messages over a single wire simultaneously.

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

Geological survey.

Geological field-work. — Mr. J. S. Diller, in his reconnaissance of the Cascade Range, passed through the Dalles, at the north end of the range, and followed it southward into California. The following is an abstract of the preliminary report made by him to Capt. C. E. Dutton, who has charge of the investigation of the volcanic rocks of that region. Andesites and basalts are found on the west side; and at Oregon City the lavas have a thickness of three hundred feet. The massive rocks stretch far southward towards Salem; and on them rest extensive alluvial deposits which form fertile plains in the valley of the Willamette, French's Prairie being one of them. Between Salem and Albany the eruptive rocks also occur; but at Jefferson, a short distance north of Albany, the miocene sandstone occurs, and is extensively used in the neighborhood for building-purposes. From Albany to Eugene City, both eruptive rocks and the miocene sandstones occur, the latter being well exposed at Springfield and before reaching the Calapooia Mountains. Thirty-five miles south of Eugene City the miocene sandstone is frequently penetrated by basaltic and other eruptive rocks. Near Cottage Grove the sandstone resembles somewhat a tufa, but contains coal, like the miocene north-east of Lebanon. Coal with a thickness of five feet is said to occur at the great bend of Pit River, but was not seen by Mr. Diller, as he did not visit the locality. The Calapooia Mountains are made up mainly of recent volcanic rocks, especially on the north side. Fragmental rocks are found on the south; but whether they are paleozoic, or not, remains in doubt. These beds extend to near Oakland, where well-marked tertiary appears. South of Rosebury is a belt two miles in width, of olivine enstatite rocks, altered, for the most part, into serpentine. It is bounded on the south by a highly tilted conglomerate, which resembles the millstone grit of the Alleghanies. No fossils were found in it, but on petrographical grounds it was referred to the cretaceous, which Mr. Diller says has not been recognized north of Rogue River valley, from which it is separated by a belt of crystalline stratified rocks, — the eastward continuation of the Rogue River Mountains. South of Myrtle Creek, schistose rocks occupy a belt along the southern branch of Umqua River to Cañonville, where crystalline schistose rocks form the prominent mountain ridge through which the gorge of Cañon Creek is cut. These rocks are penetrated by a granite which has probably been land-surface for a long time. This granite outcrops frequently in southern Oregon and northern California, especially in the Siskiyou Mountains, which are principally made up of it: it also forms Trinity Mountain and Castle Rock.

The crystalline rocks representing the eastern prolongation of the Rogue River Mountains are limited on the south by the supposed cretaceous rocks of Rogue River valley. Mr. Diller thinks that both cretaceous and tertiary rocks are embraced in the section seen on the north-east side of Stewart's Creek (a tributary of Rogue River extending eastward from Jacksonville). These rocks extend into California, where they are covered by the great flow of recent eruptive rocks in the plain north of Mount Shasta.

Little Shasta valley, especially between Shasta post-office and Mount Shasta, is an extensive plain covered by a flow of basic lava like that on the great plain east of the Cascade Range in central Oregon. Mount Shasta rises above a similar plain.

At the Haystacks, a short distance north of the base of Shasta, granite occurs. Between Mount Shasta and Lassens Peak, Cambrian, mesozoic, and tertiary occur. Around the eastern base of Shasta to Burney valley, and westward over the mountain crest to Buzzard Roost, little else is seen than basic volcanic rocks. Four miles west of Furnaceville the road leaves Cow Creek, and ascends to the 'plain,' which is covered with angular bowlders and thin soil underlaid by coarse conglomerate. From Buzzard's Roost a cañon along Cow Creek is cut in carboniferous limestone and other altered sedimentary rocks.

At Furnaceville, in the metamorphic rocks found west of the limestone, mining operations have been carried on; but at present the openings are deserted. Farther west, cretaceous (?) strata come in, dipping towards the Sacramento; and above them, tertiary rocks full of fossils. The latter extend to the alluvial plain of the Sacramento.

The Cascade Range, constituted almost wholly of basic lavas, is a low, broad arch, not less than seventy-five miles in diameter, rising from 3,300 feet at Summit Prairie, near Mount Hood, to 5,600 feet at Crater Lake. About the head of Deschutes River the general plain, which more or less gradually merges into the slope of the mountains, has a height of 4,700 feet. Throughout Oregon this plain lies about a thousand feet below the general crest of the range; and both are formed of lava sheets arising from fissure eruptions. There are numerous topographi-

cal elements on the broad arch produced by local extrusions, or subsequent erosion; lava having been poured from many craters that rise from eight hundred to eight thousand feet above the arch, forming an irregular series of ridges having here and there a radial arrangement. Some are on a line, as if from a common fissure; but, for the most part, they are irregular in distribution. The great peaks of the range are all remnants of old craters. The larger ones form the most prominent peaks of the system, and, although post-miocene in age, are older than many of the smaller ones, which are mainly cinder-cones, which retain their crater-form more or less perfectly. As a rule, also, the latter are basaltic, while the chief mass of the larger ones is andesitic.

While Pit River, and perhaps some of its prominent tributaries, as well as the Umqua and Rogue rivers, are examples of antecedent drainage, it is probable that the Klamath and Columbia rivers, with their tributaries, are, in part at least, consequent. However, the trip was too hasty to make completely trustworthy observations on this point.

— During July, August, and September, Dr. F. V. Hayden, with Dr. A. C. Peale as an assistant, made a geological reconnaissance along the line of the Northern Pacific railroad from Bismarck, Dakota, to Helena, Montana. Geological sections were made at various points, especially with reference to the line between the Fox Hills cretaceous and the Laramie group. Collections of fossil plants and shells were made at Sims, Gladstone, and Little Missouri, in Dakota, and at Glendive, Miles City, Billings, the Bull Mountains, Stillwater, Livingston, Bozeman, and other places, in Montana. The various coal-mines along the line of the road were visited and examined, as were also the borings for artesian wells at Bismarck, Dakota, and at Billings, Montana.

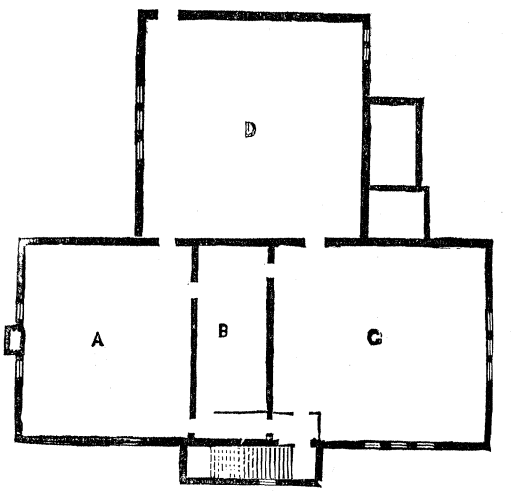
STATE INSTITUTIONS.

University of Kansas, Lawrence.

The new chemical laboratory. — The regents of the university have wisely provided for the increased growth and importance of the chemical department by the construction of a building for laboratory purposes. It is built of native limestone, with dressed stone and brick trimmings, and, as may be seen from the engraving, is in the form of a T.

The part extending east and west is 80 by 35 feet, and the L north of this is 40 feet square. The main laboratory and lecture-room are finished to the rafters, and all the rooms on the main floor are provided with additional light and abundant ventilation by sky-lights. The ground-floor rooms are 12 feet in the clear, and well lighted. These are occupied by an assay-room with crucible and muffle furnaces and complete apparatus for the fire assay of ores, and also by laboratories for blow-pipe work.

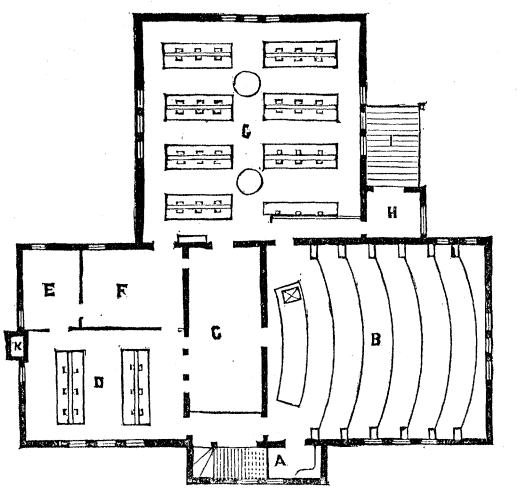
The east wing of the main floor, which is 14 feet to the eaves, is occupied by a lecture-room, seated in amphitheatre style, and capable of accommodating form 80 to 100 students. In addition to the ventilating apparatus above mentioned, the plan includes flues in the wall, connected with hoods, and hoods in the centre of the main laboratory, which are ventilated by glazed pipes terminating above the roof.



GROUND-FLOOR PLAN.

A, fire assay room; B, storeroom; C, metallurgical and blow-pipe laboratory; D, wet assay room.

All the rooms are supplied with running water, and gas, and heated by steam. The laboratory intended for qualitative students has over 25,000 cubic feet of air-space, and is intended for 54 students, each to be supplied with cupboards, sets of reagent bottles, etc. The tables are to be furnished with slate tops, and, in the quantitative room, with filter-pumps.



SECOND-FLOOR PLAN.

A, washroom; B, lecture-room; C, storeroom; D, specialists' laboratory; E, balance-room; F, professor's office; G, qualitative laboratory; H, porch; I, stairway.

Protection from fire is insured by means of a large tank in the attic, from which pipes supply the different rooms.

The building was erected at a cost of $12,000; and this sum, wisely and economically expended, leaves the chemical department as amply provided with facilities for instruction as any institution west of the Mississippi.

E. H. S. BAILEY.

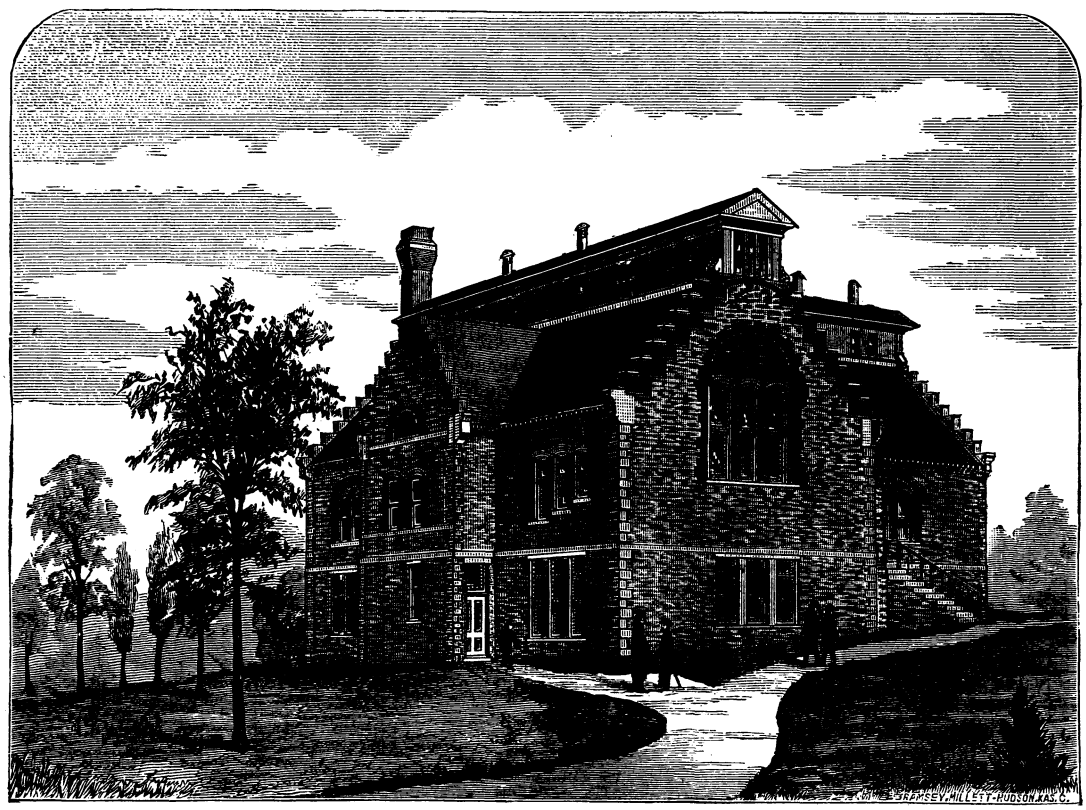
Lawrence, Kan.

NOTES AND NEWS.

Nature states that the Swedish frigate Vanadis has just started on a cruise round the world. King Oscar's second son participates in the cruise, as well as Dr. Hjalman Stolpe, who has been commissioned by the government to collect materials for the nucleus of a national ethnographical museum in Stockholm. The frigate, whose mission is chiefly scientific, will call at many places of interest, as, for instance, the Straits of Magellan, the Marquesas and Hawaiian Islands, the remarkable Malden Island, etc. A Swedish merchant, M. Fürstenberg of Gothenburg, has contributed six hundred pounds for the purchase of objects of scientific value.

— The Conseil municipal of Paris has granted a subsidy of 38,000 francs for the construction of a building in the Parc de Montsouris for the use and annual exhibitions of the Central society of apiculture and insectology. It is hoped to hold there the exhibition of 1885.

— M. Bourdalou having published in 1864, in his work 'Nivellement général de la France,' that the average level of the Mediterranean is by 0.72 metre lower than that of the Atlantic, this result was received with some distrust by geodesists. Gen. Tillo points out now, says *Nature*, that this conclusion is fully supported by the results of the most accurate levellings made in Germany, Austria, Switzerland, and Spain, which have been published this year. It appears from a careful comparison of the mareographs at Santander and Alicante by Gen. Ibanez, that the difference of levels at these two places reaches 0.66 metre, and the differences of level at Marseilles and Amsterdam appear to be 0.80 metre when compared through Alsace and Switzerland. The 'Comptes rendus de la commission permanente de l'association géodésique internationale' arrive at 0.757 metre from the comparison with the Prussian levellings; whilst the fifth volume of the 'Nivellements der trigonometrischen abtheilung der landesaufnahme' gives 0.809 *vid* Alsace, and 0.832 *vid*



NEW CHEMICAL LABORATORY OF THE UNIVERSITY OF KANSAS.