

this large amount of nitrogen which has already flowed from the well, an amount equal to not less than 125 million cubic feet measured at atmospheric pressure. A little farther east in the state there are hundreds of natural gas wells which produce a natural gas similar to that of Indiana, Ohio and Pennsylvania. For comparison a few analyses from different places in the state are here added, made by Professor E. H. 'S. Bailey, of the University of Kansas, years ago.

CHEMICAL COMPOSITION OF KANSAS NATURAL GAS.
EXPRESSED IN PER CENTS.

Components of Gas.	Paola.	Osawatimie.	Iola.	Cherryvale.	Coffeyville.	Independence.
Hydrogen, H.....	0.00	0.00	0.00	0.00	0.00	0.00
Oxygen, O.....	0.45	trace	0.45	0.22	0.12	trace
Nitrogen.....	2.34	0.60	7.76	5.94	2.21	3.28
Carbon m-oxide, CO.	1.57	1.33	1.23	1.16	0.91	0.33
Carbon dioxide, CO ₂	0.33	0.22	0.90	0.22	0.00	0.44
Ethylene series, C ₂ H ₄ , etc.....	0.11	0.22	0.00	0.00	0.35	0.67
Marsh gas, CH ₄	95.20	97.63	89.66	92.46	96.41	95.28

It will be seen from the above table that oxygen is present in small quantities in almost all the samples analyzed and that nitrogen is present in all of them, reaching to a little over seven per cent. in gas from Iola. It is possible, of course, that a small amount of air was left in the gathering flask, but not probable. If so the amount of oxygen present would correspond to a proportionate amount of nitrogen, much less than is given in the table. Therefore, we may conclude that traces of nitrogen are usually present in Kansas natural gas. Carbon monoxide and carbon dioxide also are present in small quantity, but almost all the volume is marsh gas, CH₄, which reaches 97.63 per cent. in one sample. But in the Dexter gas no oxides of carbon could be found.

If we assume that the Dexter gas represents a volume of air which in some way was embedded hundreds of feet beneath the surface, then a number of interesting inquiries are presented, such as: What became of the oxygen? If it was consumed or absorbed by organic matter then why is the gas totally

void of the oxides of carbon which are found present in small quantities in almost all natural gases? Is it possible that ground water absorbed the oxygen from a mass of air, leaving large quantities of nitrogen unabsorbed? Under ordinary conditions the ratio of absorption for oxygen and nitrogen by water is different from the ratio between the two gases in the atmosphere. It is possible that ground water simply absorbed the oxygen, leaving a residue of nitrogen unabsorbed. It must be confessed this hardly looks probable. But even if it is possible the most important question yet remains, namely, how did so large a volume of air become entombed in the ground? The writers hereof are unable to advance any views on this phase of the subject.

ERASMUS HAWORTH,
D. F. MCFARLAND.

COMMENT.

Under the view that the earth's atmosphere and hydrosphere represent volatile matter forced out from the interior of the shrinking globe, the Dexter nitrogen supply is simple and natural. It is one of many indications that the interior supply of gases is not exhausted and that the atmosphere is still growing.

H. L. FAIRCHILD.

THE TEACHING OF AGRICULTURE IN SOUTH CAROLINA.

CLEMSON AGRICULTURAL COLLEGE of South Carolina has recently completed a commodious building for the purpose of teaching the sciences related to agriculture. This building was dedicated to its use on August 9, by appropriate exercises. On that occasion Hon. J. E. Tindal, of South Carolina, delivered an address and dedicated the building to the prosecution of agricultural sciences. There was present a large audience of farmers and prominent men from different portions of South Carolina and neighboring states. The following is a synopsis of Mr. Tindal's speech:

The dedication of the building, he said, marks the seeming completion of the college. This building was put up last because the work of agriculture could be carried on better than could the work of other departments

without separate buildings. The money was not available to erect all buildings at once. Those in greatest demand were built first. The college is now complete with six departments. These six departments represent the great industrial forces of our great state. We are making a new era, but that era did not begin with reconstruction. South Carolina University was abolished and the South had nothing to do with that monstrosity. It began with 1876. The old South Carolina College was established. The negroes were given a college at Orangeburg, and the citadel was given to the whites at Charleston. But the old classical education, while good and while still good, did not go far enough.

The wonderful advance along industrial lines has wrought a revolution in all departments of life. These new forces of nature have been applied to all professions and trades. No education can be adequate that does not take these forces into consideration. Clemson College was founded to meet the very necessities of the times in which we live.

No individual can master the whole of the knowledge of this generation. But a man may master the world's thought in his own particular vocation. If a state has men who do this, then that state stands at the very forefront of progress. For a long time agriculture was neglected. But the learned men of Europe soon saw that the business of the world would collapse unless attention was given to agriculture. So experiment stations have been established where learned men pry into the secrets of nature as they affect human life. If any new discovery is made in any department of science, your professor of that particular line gets it and gives the benefit to our state.

Knowledge has so multiplied that men must specialize. The man who does so gains distinction and wealth and is a benefactor of the race. A man who masters the forces of nature and applies them to his vocation deserves respect. He deserves it when he is a farmer just as much as when he follows any other calling. When farmers begin to specialize then we shall have diversified farming.

You claim that we spend too much money.

Why, we don't spend an infinitesimal part of what we ought to spend to bring our state abreast the times. Japan, though not much larger than South Carolina, has 175 experiment stations.

Clemson has awakened thought in our state. The farmers are beginning to realize that there is something to learn besides what they already know. It has got them out of ruts.

The success of this college depends on you. If you have a bright boy and want him to become a doctor, you send him to college; so if you want him to become a lawyer. But if he is to farm you turn him loose in ignorance. Why not educate him too?

South Carolina depends on you. This land is your inheritance. It should be the inheritance of your children. If it is to be, you must get the best knowledge obtainable.

Here Captain Tindal addressed himself to the faculty of the college, impressing upon them the responsibilities that rested upon them, and complimenting them upon what they had done. He spoke of the contribution the other departments of the college had made to the nation, but the state must look largely to the agricultural department.

Captain Tindal's speech was scholarly and forceful and was listened to with interest.

The agricultural hall contains thirty laboratories and lecture rooms. The sciences have been well provided for—general agriculture, geology and mineralogy, veterinary science, botany and bacteriology, horticulture, entomology and zoology, animal husbandry and dairying. The state experiment station is also located in this building. The board of trustees have endeavored to furnish these laboratories and lecture rooms with the best apparatus and appliances so that the teaching and experiments may be conducted in accordance with modern requirements. There is also a large room in this building set aside for a museum, where the different divisions and departments will display for the use of the students scientific specimens which will also be of value to the casual observer, and to the man who is investigating some special topic in his line. The structure consists of three floors, and is built of the best

material available, finished in pressed brick and stone trimmings.

The work of Clemson Agricultural College in the line of agriculture has been greatly advanced within the last several years because of the active demand on the part of the farmers for information concerning their profession. They assemble here each year in large numbers during the middle of the summer, and spend a week with the professors of the institution and distinguished experimenters from other sections of the country, in the study of sciences relating to agriculture. The erection of this building, therefore, has been in accordance with this demand. The board of trustees are endeavoring to meet the requirements of the situation, and there is great desire on their part to give all the facilities, so far as the income of the college will allow, not only for the purpose of teaching agriculture, but at the same time for encouraging original research on the part of the gentlemen who have charge of the various divisions in the department. There seems to be a considerable awakening on the part of the people all over the state for knowledge in scientific agriculture, and in other lines of industry, and the erection of this building with its modern facilities will go far towards encouraging this awakening on the part of the industrial classes of the state.

The college was established in 1889 by an act of the state legislature, and opened for the admission of students in 1893. The first class graduated in 1896, and the college has sent out a total number of 295 graduates. The total number of students enrolled for session 1904-5 is 641, and the total number of the faculty is 44.

The college is engaged in work in the following lines of scientific and industrial activity—agriculture, mechanical engineering, electrical engineering, civil engineering, textile engineering, chemical science and the subjects of general literature necessary for an educational foundation.

The college is located on the estate of John C. Calhoun, his mansion being situated in the center of the campus. Mr. Thos. G. Clemson, son-in-law of John C. Calhoun, donated the property to the state for the purpose of a col-

lege of this character, giving 800 acres of land and \$58,539 in securities. The state has added to the land so that it now amounts to 1,136 acres. The board have spent in the fifteen years since the college was founded \$656,721 in the preparation of the grounds, the installation of electric lights, water works, sewerage system and the erection of nine large buildings, 36 smaller structures for college purposes and 57 residences for the faculty. The departments are well equipped with appliances and apparatus for the prosecution of work along the lines required in modern colleges.

The income of the college is from several sources and amounts to \$150,287. Besides the educational work, the college is required by law to carry on experiments in agriculture for the benefit of the farmers of the state and is in charge of the inspection of fertilizers, plants and animals, and is conducting elaborate courses of farmers' institute work. It will thus be seen that Clemson College is endeavoring to do for the industrial classes of South Carolina advanced and valuable work.

The limit of age for admission to the college is sixteen years. Every year the authorities are compelled to turn off a large number of applicants for the lack of the facilities to take care of the students who are striving for the scientific education given by colleges of this character.

P. H. MELL.

CLEMSON COLLEGE, S. C.

SCIENTIFIC NOTES AND NEWS.

THE city of Berlin has arranged a competition for plans for a monument to Rudolf Virchow. It is to be placed at the intersection of Karl and Luisen Streets, a square which will henceforth be known as Virchow Platz.

PROFESSOR LEWIS BOSS, astronomer of the Dudley Observatory of Albany, N. Y., has been awarded the medal of the Royal Astronomical Society.

THE Botanical Society of America elected the following officers at the recent Philadelphia meeting: *President*, Professor R. A. Harper; *Vice-President*, E. A. Burt; *Secretary*, Dr. D. T. MacDougal; *Treasurer*, Dr.