THE TAR HEEL.

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"PENDING PROBLEMS IN HYGIENE.

Lecture by Dr. Paul Barringer of the University of Varginia.

On last Friday evening, in the College Chapel, Dr. Paul Barringer, Chairman of the Faculty of the University of Virginia, lectured to the students on "Some Pending Problems in Hygiene." His lecture was most interesting and instructive, and it was appreciated and enjoyed by all who availed themselves of the opportunity of hearing this distinguished son of Carolina.

In speaking of the wonderful advances that have recently been made in the medical profession Dr. Barringer said that the causes of such diseases as typhoid, tuberculosis, diptheria, etc. are now known and if we continue to have them the fault is our own. Cancer, however, still remains a terror, having increased one hundred per cent in the last fifty years. It remains to be learned whether this is caused by living organisms or whether it has a chemical origin' In veterinary medicine the first protozoa were discovered in the cattle of Texas, and upon investigation it was found that they were caused by a tick. Remove the tick and you remove the fever.

Dr. Lincoln of Washington, D. C., once said in a half joking way that the mosquito was the cause of malaria. Recent discoveries have proved the truth of this statement and it is now known that mosquitoes do carry malaria and that this is the only way in which yellow fever is carried from patient to patient. In the Cuban hospitals yellow fever patients are placed beside those suffering from other troubles—— separated from them only by mosquito screens.

Not all kinds of mosquitoes carry malaria. The common culex does not. There are three speeies of malarial mosquito in Amcrica. They may be known by the spots on their wings. They do not breed as the ordinary mosquito but require water on the ground. How does the mosquito carry malaria? It requires about twelve days, after the mosquito has bitten the yellow fever patient, for the protoplasmic elements to develop in the mosquito and get to the salivary gland from which they are injected into the body when the mosquito bites. The time, however, required for the development of these protoplasmic elements depends upon the warmth of the climate. It requires only 10 or 12 days in summer, whe eas 25 or 30 days may be required in winter. If in the ummer time the mosquito bites a yellow fever patient and then sixteen days later bites an immune, that one is sure to have yellow fever. There is no other way in which yellow fever is carried from patient to patient. Dr. Ried, a classmate of Dr. Venable's at the University of Virginia, has made remarkable discoveries in yellow fever and thrown long-needed light on this line of study. For his great work in Cuba President McKinley told him he had done more for American commerce than all the acts of Congress since the inception of this government. February last there were 98 cases of yellow fever in Cuba; this year there are none. And all that is necessary to keep off the fever is to keep off the mosquito. "Medicine is not a science. It is the sum of a half-dozen or more sciences applied o one definite end. Within the last fifty years the medical course of study has increased from three or four months to four years of hard systematic work. The medical degree now requires an A. B. and four years of medical study. A doctor should be able to investigate, understand and record any case coming under his observation." The field of medicine is a broad one and one which offers unequaled opportunities for the man of brain and energy. Rapid advances are now being made but much remains to be known. "Ye shall know the truth and the truth shall make you free."

Athletics.

The time is drawing near when track work will begin. It is hoped that there will be a large "turnout" both of old and new men. With our o'd men and some dark horses among the freshmen our prospects for a strong team are good but it will mean work on the part of everyone—there can be no resting on last year's laurels or condition. March 17 is the date set for the beginning of active out-door work, providing that the weather will permit. Every man who expects to try for a place on the team will be expected to begin preliminary work in the gymnasium before February 25. Those men who anticipate entering for runs over half a mile are requested to do their preliminary work by cross-country running varying the distance from a half to two or three miles, runs to be taken daily.

E. VON DEN STEINEN, Coach.

Meeting of the Elisha Mitchell Society.

The Elisha Mitchell Scientific Society held its monthly meeting in the chemistry lecture room Tues. night, Feb. 11th. The following papers were read "The Pressure of Light," by Mr. Latta, "A Nineteenth Century Geometry," by Dr. Henderson and "Some of the Properties of Atoms," by Dr. Mills. This was ths most interesting meeting that the Society has had in some time.

Mr. Latta said in part:

For a long time, the problem as to the nature of light and the manner of its propagation through space has been given much attention by students of physics. What is perhaps the best work that has been done in this field during the last fifty years was done by Maxwell, who a few years ago formulated what is known as Maxwell's electro-magnetic theory of light. A part of this theory is the couclusion that light exerts pressure in the direction of propagation. According to Maxwell's calculation this pressure, at the surface of the earth, amounts to 0.0000000000592 grams for each square centimeter of illuminated surface. Since this pressure must vary inversely as to the square of the distance from the center of the sun, it would, at the surface of that body, amount to 0.0 0275 grams per square centimeter. Therefore a cubical body having a volume of one cubic centimeter and the density the same as that of water would, at the surface of the sun, be acted on by a repellent force of 0.00275 grams. Because of the graivitational attraction, it would at the same time be drawn towards the center of the sun. But gravitational attracton is proportional to the mass of the body attracted; that is, in the case of a cubical body, to the cube of an edge. The pressure of light is proportional to the area of light illuminated; that is, in the case of a cubical body, to the square of an edge. Therefore, as the cubical body at the sun is taken smaller and smaller still, the repellent on it diminishes much less rapidly than does the attraction towards the sun's center. Similar reasoning holds for spherical bodies. Hence on very small particles the repellent force would overbalance the force of attraction, and such particles would be driven off into space by the pressure of light.

Use has recently been made of the pressure of light theory in explaining why the tails of comets are always directed away from the sun. Astronomers generally hold the opinion that cometic matter consists of hydrocarbons of low specific gravity, and it is known that all observed comets have passed very near the sun. Four or five have passed within 300.000 miles of that body. Recent theory holds that, as the comet draws near the sun, small particles of cometic matter are driven backward by the pressure of light and made to form the train of matter, which this pressure keeps pointing away from the sun, and which is known as the tail of the comet.

The pressure of light theory is also an explanation of the aurora borealis. It is that negatively charged particles of matter thrown off from the sun: that those coming towards the earth are captured by the earth's line of magnetic force; and that as these charged particles move along the line of force toward the magnetic pole they encounter dense layers of the earth's atmosphere and caused to glow, thus giving the streamers of light known as the aurora.

Dr. Henderson said in part:

The idea is very prevalent that geometry is the same today that it was in Euclid's time over two thousand years ago.

Among the various *new systems* of geometry constructed in the last few centuries, one in especial —the Geomotry of Position— set up and constructed in the 19th Century is of pecular interest.

The geometry of the ancients is in essence metrical; the Geometry of Position description, lacked generality; the latter is always continuous, with generalizations to infinity.

The ancients, notably Euclid, Apollonius, Pappus and Meneloas, were aware of a few of the fundamental principles of modern geometry but the construction of system, wholly independent of the method of the ancients, was the work of Carnot, Monge, Poncelet, Steiner, Von Standt and Chasles.

Poncelet wrote his monumental work with its enunciation of the principle of duality while confined in a Russian prison; Von Standt, the Eucld of modern geometry, constucted a marvellous theory of geometrical imaginaries—analmost incredible achievement.

The modern method of graphical statics one in great measure the outcome of the discovering of modern geometry;hundreds of mechanical and engineering problems are most conveniently and elegantly solved by modern methods. Modern Analytic Geometry is in reality the algebraic side of Modern Pure Geometry. In a word the great principles of continuity and reciprocity, together with that potent factor generalization, have given the geometry of the nineteenth century a distinction peculiarly unique, modern and essentially great.

The principles of continuity and duality were represented by figures on the blackboard.

Dr. Mills said in part:

The problem is to find the properties of particles one thousand times smaller than the smallest particle microscopically visible. Joule in 1857 gave the first approximate measure of the average molecular velocity making use of the kinetic theory of gases and the mechanical fact that the blow delivered does not depend on the number of particles but only on thier mass. Maxwell made use of the Calculus of probability and the principles of the conservation of energy to deduce more accurate estimates. Thus the motions of the particles becomes known.

The free path of a molecule and the number of collisions per second are obtained by measurements of the viscosity, diffusion and conductivity of gases and these methods give substantial agreement. The size of a molecule can be best estimated from measurements made on the index of refraction and the dielectric capacity. The size in connection with the foregoing theories gives the number and knowing the number in a given space their mass and distance apart are easily obtained. The results are startling but can be regarded as fairly accurate estimates.