tablished. I compared this uterus with that of a woman who had died after an abortion at the third month, and the appearance in the two cases were precisely similar.

**FIG. 26.**

Uterus of a woman who died from apoplexy during the catamenial flow. The whole of the mucous membrane of the body of the uterus is wanting.

The state of the uterine mucous membrane during menstruation has occupied many observers. It has generally been described as thicker and more swollen during the catamenia than at other times. It should be mentioned, however, that descriptions of the uterus a few days before or after the menstrual flow can have little bearing upon this subject, and it is a rare occurrence to get the uterus of a woman who has died in the middle of healthy menstruation. No safe conclusions can be drawn from the cases in which women suffering from severe disease have a sanguinous discharge from the uterus at the time of death. Professor Simpson, in 1846, in his paper on the expulsion of the entire mucous membrane in certain cases of Dysmenorrhœa, drew a comparison between ordinary menstruation, the newly-formed skin gives way, or the healthy granulations slough, and blood exudes from the surface for several days; after which, the ulcer heals, or puts on a healthy aspect, until the approach of the next catamenial period. I have at the present time a patient whose menstrual ulcer upon the dorsum, is changing coat, by a process similar to the reproduction of lost parts.

The mucous membrane of the uterus becomes excrementitious every month, and is discharged from the cavity of the uterus in a similar manner to the mucous membrane of the body of the uterus, and we have a reasonable explanation of the mode in which this peculiar function is performed.

In an Address Delivered by

SIR J. KAY SHUTTLEWORTH, BART.,

AT THE

SCHOOL OF MEDICINE, CHATHAM-STREET, MANCHESTER,

ON THE OCCASION OF DISTRIBUTING THE PRIZES TO THE STUDENTS January 21st, 1856.

GENTLEMEN,—In accepting your invitation to distribute the annual prizes at this School of Medicine, I do not feel myself entitled to address you at length on the more recent events in Medical Science. You are familiar with the progress in its several departments. It is more congenial to my own sense of propriety to approach this school of a special art rather as a spectator, who may bring reflected lights from other regions of thought.

In so far, therefore, as I may think it expedient to refer to recent discoveries, my object will be to analyze the modes of investigation by which this progress has been made, and to define the paths of inquiry in which further progress may be possible.

On the policy of medical education it would be presumptuous for me to treat in detail, but I may be permitted to contemplate the external interests rather than the internal economy of such institutions as this medical school. Such a review of the external relations of the art and the school may be justified on many grounds, and, amongst them, on the following:-On the one hand, the art of medicine is affected by everything which promotes the growth of medicine; and, also, by our whole intellectual history. On the other hand, it is not merely an art which explores the physical constitution of man, and the subtle laws of mind, but the condition of that art is a sign of the state to which civilization has advanced. The interval between the mystery-man and Hippocrates, or Sydenham, or Harvey, marks the distance between savage and civilized life. The art has also a social relation which everything tends to develop. The school of medicine is an important part of the means of progress possessed in any country. The physician may so represent the relations of science to the well-being of man, as to become one of the most influential ministers of the arts of wealth.
First let us very briefly glance at the influence which preva- 
led in the art of medicine and its development. From the most distant period the the path of inductive observation, on which they threw all the

The Lancet, [Sir J. Kay Shuttleworth on the Progress of Medical Science. [Feb. 2, 1850.]

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In selecting remedies than by the progress of the exact sciences than

process, and health thus restored."......" In selecting remedies
then, especial attention must be paid to the chemical con-

In these discoveries the names of Laennec, Louis, and Andral,
deserve to be held in the greatest veneration.

A similar advance was made in the pathology of the brain
and nervous system, which, combined with the results of
investigations of Bell, Majendie, and Flourens, as to the functions of its
different parts, has thrown a flood of light on this class of
diseases.

The progress of structural pathology, in the classification
and diagnosis of diseases of the abdomen, has also been great. But
in the great assimilatory system it is obvious that a chemical
pathology must come to its aid. This has been illustrated by
the researches of M. Frout, by means of the systematic analysis
of morbid states..."When the idea that the philosopher's stone was a universal
remedy to the use of chemical preparations in medicine, and
its application in the treatment of patients, was a step forward of incalculable im-
portance."......"In the spirit and mind of Paracelsus the new ideas of the

times were concentrated, and assumed a definite shape." Before these doctrines the Galenic theories, which
had held an almost undisturbed empire for thirteen centuries, disappeared, and the practice of the art assumed a form, which
has chiefly been modified by the application of the inductive
philosophy to the study of the exact sciences, and especially to
the discoveries in chemistry, physiognomy, anatomy, physiology, and
general physics.

The illustration of this species of external influence, which,
in modern times, affords the most striking contrast, is that
presented by the state and progress of medicine in the preceding
period in the schools of Northern and Central Europe, which
compared with those of the West. With the revival of experi-
mental philosophy, which distinguished the close of the last,
and the beginning of the present century, the art of Medicine
was affected not less by the progress of the exact sciences than
by the form which metaphysical philosophy assumed in the
North and South of Europe. In the middle ages the so-called
scholastic philosophy, by diverting the attention of the learned
from the observation of Nature and a system of induction, and
by expending the thought of Europe on barren speculations on
subjects beyond the limits of human research, and on disputes
of words, substituted a school of sophistry for one of philosophy,
and prevented the growth of experimental medicine.

In modern times metaphysics have exerted an equal, though happily a
more useful influence on the progress of truth. The philosophy of
France led it away from idealism, even to materialism, and to
scepticism. In its dialectics the language itself favoured habits of the most severe analysis, a delicate precision in defi-
nition, and the most algebraic form of reasoning. The French
naturalists were distinguished by their skilful observation, and by
the subtlety and boldness of their calculus—the French chemists
by the ingenuity, dexterity, and penetration of their analyses
—the French physicians by their researches in structural patho-

you will observe that in all this they pursued rigidly

First let us very briefly glance at the influence which prev-
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improvement in almost every department of structural
pathology. Before this period diseases of the heart had not been
distinguished; many diseases of the heart and lungs were
unknown; dropsies of the chest were attributed to general
weakening of the circulation, and not to the obstruction of the circulation in
the heart or great vessels. Many other grievous errors had been
committed, which it is not my province to point out. Now not only are the diseases of the heart and great arteries, the
principal subjects of modern medicine, fully defined, but we are made aware of
accurate results of these discoveries in structural pathology, but
by means of a much more refined and searching form of physical
diagnosis than had before been conceived, these changes of
method have generally been attended with a corresponding
increase in the number of cures. In these discoveries the names of
Laennec, Louis, and Andral, deserve to be held in the greatest
terion of a myth is, with them, only the first step to the adop-
tion of some bold generalization, by which they fill the void
which has been created, and anticipate the facts and theories with a hardihood as great as that of

the skulls would be proved by comparative anatomy to be a

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period, when the severe inquiries of analytical chemists and structural pathologists have been unable to restrain this creative action. But, historically, it is of the utmost importance, and it is nowhere to be traced in various directions; but all, more or less, enter into a current which flows towards a humoral pathology.

You are aware how great a part the use of the mineral waters of the German spas (found along the great spine of rocks which crosses central Europe) plays in the remedial agencies of the German art. The resort to these spas commenced in the period of empirical observation, a century and a half or more ago, without any attempt to penetrate to the principles round which the facts may be grouped. Moreover, it is not wise, as is too common with physicians, to dismiss to the limbo of chalatanism, those eccentric hypothetical or empirical discoveries in the art, which a pseudo-science leads its votaries by its fitful and false sanc-
tions to. To these have succeeded, as I have before said, the researches of Liebig and his school into the chemical constitution of organic fluids and structures, and on the nourishment, growth, and decay of living bodies, and those of modern chemistry. National distinctions in modes of thought and investigation are disappearing as rapidly as national costume, and the science of Europe now appears to obey the laws of induction expounded by our own Bacon. The intercourse in laying the only true scientific basis of a chemical pathology.

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apparatus, and used up to afford in the muscles of the nervous system, in the nervous life to obey the volitions to convey sensation, and to enable every tissue to fulfill its appropriate functions. Vegetable life is a reducing apparatus, which, under the influence of light and a proper degree of heat, absorbs that energy from the atmosphere (either directly or by the medium of the humus and water of the soil) a part of the elements already enumerated. These elements are so combined that while a part of the oxygen is liberated, the rest are united into the organic principles on which animal life is supported. On the other hand, animal life is an apparatus of combustion.

The organic principles formed in vegetables, having ministered to all the functions of animal life, are consumed and set free by the energy of combustion. The oxygen, which thus is united with it in the manufacture of the specific excretions, are facts which indicate, though they may not prove, the influence of specific virus on the constitution of the fluids, such as those of gout, rheumatism, the phosphatic diarrhea, and from the bright scarlet of arterial, and the dark chocolate color of venous hemorrhage, one may be able to distinguish the disease consequent on this change, it is surely not rash to discern a great fact in humoral pathology. Thus, also, all observations on those external causes of disease which are under the influence of sanitary precautions, are wholly other than those evinced by the proving effects of malaria and other noxious influences, chiefly on the blood. The microscope shows, not only that the simplest animalical organism is a sac imbibing fluid, but that the tissues of animals have a cellular construction of like simplicity. Dr. Alison, in his papers on Vital Affinity, points out that the functions of the globules in the blood may have a similar direct relation to the health, and therefore to the chemical constitution of that fluid, as have the cells of tissues or the sacs of infusoria to their structure and contents. In support of this view it may be stated that the haemolysis of the red corpuscles is the result of a chemical action taking place in the blood of the body, and that the oxygen in the blood of the animal is but a part of the oxygen which is evolved in the early stage of the decomposition of the carbohydrates or fats, by the action of a ferment or enzyme. This may be seen in the process of fermentation, which quinine acts as an antidote to marsh fever, as with the formation of hematine. We may in this way conceive how a morbific virus, a misanthropic, or malaria, may operate, not as a leaves in the blood, but through the medium of the corpuscles, the vital action of which on that fluid may be suspended, or modified, or even destroyed by other means. In this case, the inorganic substances, as the analysis of organic structures and fluids in animals and vegetables, have laid this scientific basis of future discovery. These discoveries have already shown the nature of the mutual dependence of animal and vegetable physiology therefore is not merely a comparison of the power needed for the definition, we should find that chemical laws and atomic constitution of its parts are instruments, operating under the new conditions of life, for objects which each distinct animal or vegetable is intended to accomplish. If any tissue, or any fluid feeding a tissue, degenerates, the phenomena of life are disturbed. If we have the analytic power needed for the definition, we should find that chemical changes occur in every disease, both in the solid structures and humors of the body. But perhaps the 6a?HMMMEH<M?M crucis event in these discoveries has been the establishment of the following laws:—first, to classify diseases according to their external phenomena; then to correct this classification, according to the changes of structure which attend them; then to add to the distinctions of symptoms which they exhibit, the absence of symptoms that should be there. The labours of Front, Lavoisier, and others, have already been before us, to define diseases by changes to be detected only by chemical investigation, and thus to lay the only true scientific basis of chemical pathology. The labours of Front, Lavoisier, and others, have already been before us, to define diseases by changes to be detected only by chemical investigation, and thus to lay the only true scientific basis of future discovery. These discoveries have already shown the nature of the mutual dependence of animal and vegetable physiology therefore is not merely a comparison of the power needed for the definition, we should find that chemical laws and atomic constitution of its parts are instruments, operating under the new conditions of life, for objects which each distinct animal or vegetable is intended to accomplish. If any tissue, or any fluid feeding a tissue, degenerates, the phenomena of life are disturbed. If we have the analytic power needed for the definition, we should find that chemical changes occur in every disease, both in the solid structures and humors of the body. But perhaps the 6a?HMMMEH<M?M crucis event in these discoveries has been the establishment of the following laws:—first, to classify diseases according to their external phenomena; then to correct this classification, according to the changes of structure which attend them; then to add to the distinctions of symptoms which they exhibit, the absence of symptoms that should be there.
from empirical experiment. The facts of therapeutics are in some degree generalized by the comparison of groups of phenomena; but we cannot hope for the scientific analysis and classification of currents of such a multiform nature in chemical and histological research, both as to structure, and in physiology and pathology.

Another sphere of investigation in chemical pathology lies in the consideration of the chemical changes of structure which elude both from empirical experiment. The facts of therapeutics are in heretofore escaped the eye of the pathologist, so chemistry will in physiology and pathology.

But vital statistics is of especial importance in the vast field of etiology, and in the comparison of the various degrees of pathologic observation. The modern science of vital statistics is of especial importance in the growing science of political, nor this separated from the sources of disease which the vegetable world may propose, than to an untrained intelligence. The proportion as it employs every power for the observation of human thought, and where, even if the mass fail to raise itself above the ordinary range of acquirements as Hippocrates was in his day, or Humboldt in ours; and though we cannot hope that every member of the medical profession shall have an intelligence vary as that of the father of Medicine or the author of the "Cosmos," yet this illustration may serve to show how wide is the scientific basis of an education for this art. It is not wise to regard the preparation of a medical practitioner as a mere specialty. The schools of medicine must be able to approach with the highest cultivation through the profession, but of some advance unless the schools of medicine be regarded as parts of the great University of Learning. The physician who has charge of the phenomena of vitality ought not merely to be able to grasp every instrument which science puts into his hand, but should by the highest cultivation of his own intellect, and the moral dignity resulting from that culture, exercise the authority of a faithful minister to man in all the great crises of his existence, and of a great teacher and witness amongst his fellow-men.
c civilization. The position which these provincial schools now hold, as parts of a national college of medicine, opens some prospect of the future which lies before us. You have a right to demand that the institutions of medical education be not only efficient for the time being, but adapted to the future necessities of the profession. The foundation which has been laid for a thoroughly efficient system of primary schools renders a complete reformation of middle-class education inevitable. The extension of this system in the educational policy of England owe their origin to the Reformation, and were intended to establish that great change in religious policy by creating institutions on a civil foundation for the diffusion of polite learning. Their scheme of primary education has been adopted by the province of Scotland, and they have founded the universities with scholars, chiefly prepared for a course which was at the Reformation considered the only true discipline of the mind, and to afford the only sound education of mankind.

Since that time the whole face of this country and of Europe has been changed by social and political revolutions. The vast extension of maritime discovery, commerce, and colonization, the growth of industrial arts, which have made so many of the great powers of Nature obedient ministers to the wants of man, have caused the rapid increase in wealth, in intelligence, and enterprise of cities like Manchester, so that this has been described as "the age of great cities." In the struggle of time and place the classes, supported by manual labour, in a position to demand a proper education, to trade and commerce, or needful for such schools as that which I now address. The proprietary schools in which the instruction in science should be rendered as efficient as its great recent development and the progress of invention and taste in manufacturies; these make corresponding changes in their preparatory schemes. Every pupil who enters them ought to have passed through the preparatory discipline of a sound grammatical and classical instruction, and should enter upon their course in this school with an earnest determination to make themselves familiar with all the great models in classical literature; but you have also an absolute need that, as students of Nature, your pupils should, at a very early period, have cultivated habits of observation. They should have so far mastered the rudiments of the exact sciences as to relieve your professors, or those of any college with which you might be incorporated, from all elementary instruction. Now this, at present, the grammar-schools do not pretend to accomplish.

Even were their course of studies more complete, the revenues of these grammar-schools are often quite inadequate to the demands of the children whose wants and condition. The ministrations of the great towns in which they are situated. When the trustees have command of sufficient resources, they are often prevented—by the restrictions of the trust, by the consequences of previous mismanagement, and by the general apathy as to everything relating to a foundation buried in the discredit of its own inefficiency—from making a wise and bold effort at reconstruction. Two recent Acts of Parliament confide powers to commissions in the reorganization of the grammar-schools, and it is greatly to be regretted that the commissioners have little or no opportunity of beginning reform, and also that when their aid is invoked their power to remedy abuse is jealously restricted.

What might be accomplished by such institutions, adequately endowed and under the guidance of intelligent trustees, is sufficiently demonstrated by the remarkable success of the King Edward's schools of Birmingham, in which the present ministers of that city have laboured as administrators of the foundations of a ministry of public education. This ministry is probably almost as great as that which his learning and experience enabled him to put forth as the head of that great school.

In great cities like Manchester and Birmingham, it is important that the middle classes should have opportunities of combining domestic training and technical instruction. This would not only render instruction accessible to a much larger portion of the public, but would combine the advantages of the private boarding schools, but would combine the advantages of the moral discipline of the family with that of the school. The private boarding-schools have generally been founded on the model of the grammar-schools, and their course of studies, though equally restricted, and generally much less efficient. They combine the disadvantages of an expense that is not even in the extreme of success, often with a very imperfect instruction in classics, and much an education of science and art.

In Manchester you have a grammar-school which has been governed with more than usual wisdom and success, but this great city has far outgrown the resources of that school. The time has arrived when you must entertain the question of the foundation of a new college of medical instruction, and that so much better for the interests of these schools. In Manchester you have a grammar-school which has been created in some towns, imperfect as it is, the obvious result is that the interests of the rich are neglected while the wants of the poorer classes are not attended to. In Scotland, the burgh and high schools are governed by the town councils, and have, in a remarkable degree, promoted the enterprise and intelligence of the middle class. They are a model of an adaptation of the principles of social science, society, by a liberal infusion of appropriate studies. The future progress of trade and commerce, and the development of the art of medicine, are equally dependent on the existence of such colleges as the Ecole des Arts et Metiers, the foundation of which was at Paris, together with the evidence presented in the Universal Exhibition in that capital, of the influence of this education on the progress of invention and taste in manufacturies; these are among the most important results which have been obtained from the introduction of education to science and art cannot be neglected, without national risks which no far-sighted government can encounter.

In like manner, in order that the provincial schools of medicine may yield a proper harvest of benefit, every pupil who enters them ought to have passed through the preparatory discipline of schools, in which the instruction in science should be rendered as efficient as its great recent development and the improvement of the methods of instruction require. So little has been done in this direction, either in the schools of the grammar-schools or in the private establishments of education, that some great effort of public opinion expressed through Parliament, and issuing in the foundation of borough and rural schools, seems to be required as a remedy for this acknowledged evil.

By the reorganization of primary instruction, and the solution of the problem of the respective spheres of the religious and civil functions of education in England, it is not only to be required of the ministers of education to combine them into one harmonious college, precluding over medical education and public health, and forming one depart-
But you have a right to expect more than an efficient preparatory course. You have a right to demand that what is technical in your schools should not be regarded as a narrow specialty, but as a part of a course of collegiate discipline and learning. You have a right to be aided to place your school in a provincial college, in which your students may inhale a vital force, so that they shall not be in the atmosphere of the most liberal learning, the higher philosophy, and universal science. You have already in this city, in the foundation of Mr. Owens, the germ of such a college. I have personal habits of his class should retain at least such hold upon him, and have had no communication with the trustees of that college; but I do not hesitate to express a personal opinion that Owens' College and the medical schools of this city ought to be incorporated. The college would derive the advantage of a larger endowment, when the student learns to adapt it to and to the schools. The trustees would doubtless be ready to make arrangements for that tutorial discipline of your students which you would probably wish to combine with the professional course. The rent of separate buildings and other expenses of management might be got rid of. But these and other incidental advantages apart, the medical schools would secure a larger increase of that public sympathy and support, which would not fail to attend them as part of a provincial college, and especially would obtain for their professors and students the advantage of combining their technical course with that comprehensive scheme of learning which such a college ought to be; that of making a man, not only as far as the sympathy and self-sufficiency with which we do not hope that the Museum of Natural History and the Botanical Gardens would be developed into well-endowed professorships connected with the College of Manchester, and that Chetham's Library, the Free Library, the Philosophical and Medical Libraries, and the public institutions of a like nature, would be accessible to the students under the regulations of a strict collegiate discipline.

If this plan of incorporation should be brought about, let me urge upon you to afford to parents and guardians every security (by the adoption of a tutorial discipline and frequent reports of conduct and progress) that the whole career of your students is under the most vigilant and zealous guidance. A scheme of united local institutions, comprehensive enough and rural, with efficient and comprehensive courses of instruction, preparing scholars for the completion of their studies in the provincial colleges of cities like Manchester, might be made to harmonize well with the habits of our middle classes. By combining home education with the public discipline of the schools and college, the parent would have security, not only for the moral training of his son, but that the traditional maxims and habits of his class should retain at least such hold upon him, that the resources of literature, science, and art, would, if he were destined to trade or commerce, be exerted within that shore; for there is a natural jealousy that schools and colleges should exert a destructive influence upon the home-comforts of the manufacturers may engender tastes and habits, if they do not establish maxims, which may wean their scholars from commercial pursuits. These dangers would be avoided if private were combined with the public education, and if the discipline of trade and commerce were in the latter part of the student's career combined with that of the college. Then, with respect to the art of medicine, great advantage would arise if the education of the medical student could be so ordered that while in school and college the widest range of classical learning and science was within his reach, the gentle but salutary restraints of the family should guard our youth from those temptations to licentiousness, both in occupation and in affections of the heart.

In Owens' College, and in these excellent medical schools, you have the elements out of which to create the provincial college, and you have a right to seek the support of a theoretical kind, and other noxious trades, and crowded burial-grounds, scattered through the town. The hours of labour for women and children had not been limited, and infantile mortality was excessive. The mills of hosiery and intelligent manufacturers had not been accepted as models for ventilation and for the regulation of temperature, the removal of dust and cotton-fibre from the air. The vast works which the corporation has recently completed, at an almost unparalleled municipal outlay, for the supply of pure water to every cottage in the city, had not even been projected. The parks which have been provided for the recreation of the people, and the Saturday's half-holiday, had, indeed, been suggested in a letter to a committee of the House of Commons, but were regarded as Utopian schemes. Elementary schools were fewer, and far less efficient even than they now are; the consumption of beer, spirits, and tobacco was then, as now, excessive; the police force was as a feeble rearguard to the power which a pestilential ignorance has to make itself a pest. In this condition of the town the visitation of the cholera occurred. It was the duty of the physician to examine and lay hold of evil; it was the function of the municipality to correct them.
THE LANCET.]  
DR. WILLSHIRE ON CARDIAC PATHOLOGY.  
[February 2, 1856.

In like manner a physician is not at liberty to be indifferent to any social evil which depraves the health, or degrades the moral condition, and thus causes the race to degenerate. He is the enemy of pauperism, credulity, the maladies peculiar to certain occupations, and he is the indefatigable promoter of that which inspires esteem in the public mind, of the amelioration of the condition of the poor, and, above all, the wealth of a principality on its magnificent water supply.

This sketch of the external relations of the art of medicine would be incomplete if I failed to remind you, that it is not restricted to the elements of an observer; that it requires knowledge of the great phenomena of life, and stand in the presence of the dread reality of death. Man is not a mere variety of the animal creation, whose instincts, habits, organization, and physiology you have to study. It is true that, in the attitude of a student of Nature, your success depends on high powers of generalization, on patient vigilance, calm fidelity, humility in the presence of great natural laws, which you can only learn to interpret by the collection of facts, which become the sources of those divine combinations of genius which enabled Newton to predict the combustion of the diamond from its great refracting powers. This is all true. But the physician would be most of all a moral philosopher, whose mission it would be to live only as an observer in infirmaries and fever-wards of cities. If he could attend the ambulances or the hospitals of armies, watch the plague, the cholera, the yellow fever, or typhus, the epidemics which descend from the heavens, and the inhabitants of foul places, in which the race would degenerate if it were not cleansed out with the besom of destruction—without some inspirations of deep sympathy for the destiny of the great mass of mankind whom ignorance, poverty, and life of toil have made the earliest victims of epidemic and contagious diseases. Remember how much of what you have to do formed part of the mission of Christ. I say it with a reverential recognition of his supreme power. When John sent his disciples to ask Jesus, who art thou? Art thou the Artificer who should come, or do we look for another?" he replied, "Go and show John again those things which ye do hear and see. The blind receive their sight, and the lame walk: the lepers are cleansed, and the deaf hear: the dead are raised up, and the dumb speak.\n
... and influence, to extirpate it as the most malignant ulcer in the history.