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Charaka Sanhitā.

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October 1908.

[No. 10.

SANITATION IN INDIA*.

By SIR J. PRESCOTT HEWETT, K.C.S.I.,
Lieutenant-Governor of the United Provinces.

GENTLEMEN.—I am here to welcome you this morning on your assembling in reply to the invitation issued in this Government's resolution of the 5th ultimo with the object of undertaking a comprehensive discussion as to the manner in which sanitary reform should be prosecuted in the United Provinces. We aim at trying to devise some scheme by which, in course of time, the conditions of life may be made healthier for the residents both of towns and villages within the province; we seek some means of giving our men and women more strength and vigour with which to undertake their duties in life and to earn their daily bread, of making their days longer in the land, of endowing them with more stamina, and of insuring for them greater power of resisting disease so as to make them more fit for every form of employment, whether it calls into operation manual strength or the faculties of the mind.

The first thing that must strike every observer is that, cleanly as are the habits of a very large number of the people of India individually, they are very prone to ignore what has been well described as cooperative sanitation. Cleanliness of person and

*A lecture delivered before the Sanitary Conference of the United Provinces of Agra and Oudh at Naini Tal on September 4th, 1908.

of the habitation constitutes only part of the precautions needful to insure protection against disease, and is wholly ineffective by itself if the house is inadequately provided with light and ventilation, and if the out-of-door surroundings and the air that is breathed outside it are contaminated and infective. You have to examine the whole question of how we can improve the sanitary conditions of life throughout our province, to try to determine whether what has been done in attempting this in the past (for a great deal has been attempted) has been on right lines; and if it has not, to consider how we should rectify our past action, and in what directions, in which we may have hitherto fallen short of our duty, we should now endeavour to extend our efforts. The subject is a vast one; few, if any, of the activities either of the individual or the State are not affected by it; and anything that I can say can but touch the fringe of the problems that you will have to consider, and can only, I fear, be directed towards impressing upon you the magnitude of the task you are called on to undertake without suggesting to you the means of overcoming it.

In the resolution summoning this conference stress was laid on the fact that it is impossible to make any certain comparison between past and present vital statistics. The actual record of the number of births and deaths has become much more accurate during the past quarter of a century, but except in the case of a few well-known diseases, the village watchman—the reporting agency in the rural tracts—cannot be trusted to return the cause of death correctly. We can indeed rely on his reports regarding small-pox and cholera being fairly accurate, but he cannot discriminate between diseases, the symptoms of which are accompanied by a rise of temperature, and the deaths attributed to fever doubtless include large numbers due to pneumonia, tuberculosis of different kinds, and many other diseases. Again in the six years between 1902—when plague took hold of the province—and 1907 over a million deaths were reported to have been caused by it. How many really due to it were registered as having been caused by some other disease? Incomplete as the

record of the number of deaths attributed to it in the past six years must be, it is equivalent to the normal death-roll within the province for more than six months. This factor of itself precludes close comparison between the figures of the past few years and those of less recent periods, but the former taken by themselves are so appallingly high as to demand the closest scrutiny of all who have the country's welfare at heart.

Speaking generally, the death-rates recorded in the province in recent years, both in urban and in rural tracts, are nearly three times as high as in England and Wales. It is estimated that in India nearly one out of every ten of the population is constantly sick and a person who has escaped the diseases and dangers of childhood and youth and entered on manhood or womanhood has an expectation that his or her life will extend to only 68 per cent. of the time that a person similarly situated may be expected to live in England. Infantile mortality in the province is nearly twice as great as it is in England. I quote these comparisons to show how backward we appear to be in the protection of life as compared with the mother country, but at the same time you will all realise how misleading it would be to judge our vital statistics by results in Europe and understand how vain it is to hope that we can ever attain to the standard that has been achieved in the West. We should never forget that in this province the conditions of life, which depend on the climate and connected matters, are in some respects specially unfavourable to health and longevity. The whole area of the province is 112,000 square miles. Between one-fifth and one-sixth of this is situated in the Himalayas, with a sparse population of a little over one and a half millions. The highest density per square mile—it is only 86—occurs in the Almora district. With a splendid climate and a very sparse population comparatively little remains to be done except to induce the people to pay more attention to the cleanliness of the village sites and their immediate neighbourhood. At the same time the hilly tracts are liable to occasional epidemics of cholera of great virulence which are much assisted by the practice of the

Millions of burials in running streams the victims of epidemic disease instead of following their usual practice of burying the dead. But, speaking generally, the conditions of life in the hills are much more favourable than in the plains. The area of the plains extends to 98,000 square miles and contains a population of 46,000,000. Most of this area is flat and liable to be waterlogged during the rainy season. The mean annual rainfall is between 37 and 38 inches. The monsoon of three months is wedged in between a period of intense heat all over the province and a period of milder weather which at some places merges at night into one of intense cold. The difference between the maximum temperature in the sun and the minimum temperature in the shade within a period of 24 hours sometimes exceeds 120° ; that between the maximum and the minimum temperature in the shade is often 40° or more within the same period. These extraordinary variations in climate and temperature call in themselves for special precautions. They are aggravated by the conditions under which the people live, some of them inseparable from the agricultural operations of the different seasons or for other reasons unchangeable, others the direct or indirect result of neglect of recognised sanitary canons and susceptible of improvement. The houses in which the people live, whether in town or country, are seldom set on a high enough plinth. The average population and the number of houses to the square mile are higher than in any other part of India. The urban population, aggregating a little over five millions, number on the average 13,000 to the square mile, and rise in Cawnpore generally to 37,500 and in parts of the city to over 64,000 to the square mile. What this means can be imagined if you will reflect that in London with its buildings of many storeys the density is but 37,000 and that in Cawnpore the number of houses with more than one storey is comparatively small. The average density of the population in the villages is 427 to the square mile. It rises to 791 in the Ballia district, and exceeds 500 in 22 districts. The average number of persons per house (which frequently consists of two

rooms or even of only one) is 5·3 in important cities and 3·5 in the rest of the country. It is estimated that the average superficial area per head of the population is something like 10 square feet, and the breathing space—150 cubic feet—just half what is required in common lodging houses in England. In the rainy season high crops are grown right up to the habitations of the villages. When the spring crops are being cultivated the same soil is, wherever possible, irrigated. Little or no care is taken to arrange for the removal of refuse in the rural tracts. The village pond or tank is the receptacle of every kind: its water is regularly consumed by cattle and even by human beings. The offices of nature are performed in the fields just outside the houses, and the water of the wells is often polluted by the subsoil drainage into them. Flies are always prevalent and at certain times of the year become a pest. They have much responsibility for the communication of disease and are assisted by numerous other insects. Even this is not a complete catalogue of the hindrances to the public health in the rural tracts, but it is sufficient to show how great are the difficulties in bringing about a salutary change.

I have already sounded a warning note against attaching too much importance to comparative vital statistics in this country, but we must necessarily in approaching the consideration of all questions connected with sanitary improvement keep such statistics before us. The reported mortality per 1000 among the general population works out at the following rates in the last quarter of a century:—

1882-91	...	...	...	32·72
1892-1901	...	...	...	32·56
1902-07 (including plague)	...	...	...	39·01

In the same three periods the mortality in jails has been 25·5, 27, and 16·6 respectively. The difference is marked particularly in the last period. In jails everything is done to avoid overcrowding, each prisoner being allowed a minimum of 36 square feet of superficial area and 648 cubic feet of breathing space; large sums have of recent years been spent on improved barrack

accommodation and ventilation; there is an almost complete freedom from epidemics; the death-rate is not augmented by infantile mortality; food, water, and sanitation are good, and the hours of work regular. We cannot ever hope to get the death-rate among the general population down to the figure that has been attained in jails, but between the death-rates in the jails and among the free population respectively there is a large margin which is undoubtedly capable of considerable reduction. It is towards the most effectual means of effecting this reduction that you are asked to direct your minds during the session of this Conference.

The problem that you have to consider differs very much according as it is directed towards the amelioration of the conditions of life in rural or in urban tracts. The number of villages in the province is 105,068 and the average population of village is just over 400; 37 per cent. of the rural population inhabit villages with a population of less than 500; 52 per cent. live in villages of from 500 to 2000; 10 per cent in villages of between 2000 and 5000; and 1 per cent. in villages of over 5000. There are 453 towns the population of which varies from 264,000 in Lucknow to a population of even less than 1000 and averages about 11,600. These towns are differentiated according as they come under the Municipalities Act, the Act dealing with notified areas that were once but have ceased to be municipalities, and Act XX. of 1856, an Act to regulate police and sanitation in the smallest towns. The Village Sanitation Act applies to certain rural areas; at present it extends to some 600 villages with a population of 2000 or more. In areas other than those under the Municipalities Act or notified areas there is no compulsory registration of vital statistics by private persons. In rural areas the village watchman reports births and deaths on his periodical visits (usually twice a week) to the police stations. In the towns under Act XX, of 1856 registration is effected by the *chaukidars* employed under the Act, and in municipalities and notified areas there is compulsory registration. Returns are obtained in some

towns from non-official practitioners differentiating the cause of death, but an enormous majority of the reports of deaths are made by an illiterate agency utterly incapable of discriminating as to the cause of death.

In the past 25 years there has been large expenditure within municipalities on sanitary improvement; 113 lakhs of rupees (over £750,000) have been spent on capital outlay, 57 lakhs (£380,000) on establishment and repairs in connection with the water-supply; the capital outlay on drainage works has been 57 lakhs (£380,000) and that on establishment and repairs nearly 13 lakhs (£86,000). Expenditure on conservancy has been 215 lakhs (£1,430,000). In rural tracts and smaller towns expenditure has been on a very limited scale. In six of the seven cities with a population of over 100,000 as much as 292 lakhs (£1,950,000) have been expended on these objects, on vaccination, the improvement of markets, and protection against plague. In spite of all this expenditure the death-rates now reported in some of these cities are higher than they were before. Even if allowance be made for better reporting, it is still impossible to gain consolation from the returns.

Still, in the matter of the restriction of diseases against which special measures have been taken both in towns and villages, such as cholera and small-pox, there is room for congratulation on the results achieved. The improvement in the water-supply in cities, the use of permanganate of potassium in wells and of Nesfield's powders have all contributed to reduce the mortality from cholera. This is a disease the deaths from which are returned with fair accuracy. It used to be very virulent among the troops 20 years ago, but a serious outbreak in a regiment is now of rare occurrence. The disease is now usually sporadic and is often due to food contamination by flies. The average death-rate from this cause between 1882-91 was 1.68 per 1000, between 1892-1901, 1.49 per 1000, and between 1901-07, 1.30 per 1000. In the famine year of 1896-97 the death-rate from this cause between September, 1896, and July, 1897, was 0.96; between November, 1907, and June, 1908,

it was 0.72. There are only three districts in which famine camps have been seriously troubled with cholera this year. On the other hand, in some of the districts badly stricken with famine which have also suffered from epidemics of cholera it has been possible to protect the famine workers completely. Thus in the Bara Banki district over 3000 deaths were reported from cholera, but only two occurred on relief works; in the Gonda district there were 1900 deaths among the general population and only one on relief works. Here, at all events, there is direct evidence of the success of our sanitary department's work, and it is also to be found in the continued decline of deaths reported from dysentery and diarrhoea, a result which can fairly be attributed to the improvement of the water-supply. 50 years ago small-pox devastated the country and was specially prevalent in the hill tracts. So well protected are the latter now that the district of Garhwal has the highest vaccination rate and the lowest mortality from small-pox in the whole of British India. A great reform effected in recent years has been the substitution of glycerinated lymph for humanised lymph. The death-rate in the whole province from this disease was 1.26 between 1882-91, 0.33 between 1892-1901, and 0.25 between 1902-07. Here again, there is indisputable proof of the good results achieved by the sanitary department in popularising vaccination.

The statistics under the head of fever are the reverse of encouraging. They do not indeed show how many people died from malaria, but they give an enhanced death-rate in each successive period of the past 25 years. Whatever the extent to which this may be due to better reporting, it is most discouraging that the death-rate reported between 1882-91 (24.41) should have risen in the next decade to 25.21, and in the five years between 1902-07 to 26.49. The last figure is an appalling one. It is swelled by lung affections, tuberculosis of all kinds, and (during the past few years) by undiagnosed plague. But after making allowance for all these causes the number of deaths due to malaria is terribly high. Great strides

have been made in the investigation of this disease in recent years. The only way known to science for the propagation of malaria is by infection through the bite of the anopheles mosquito. The layman whatever he may think about the possibility of malaria being contracted in other ways must accept the view of science that so far none other has been discovered. Such action as the executive government can take then must be based on the view that what we have to aim at is the restriction of the dissemination of malaria by the anopheles mosquito. I propose to place a medical officer on duty at once to investigate the liability of certain tracts in this province to malaria and to endeavour by special measures, such as the filling up of excavations and other irregularities in the soil, treating mosquito breeding grounds with kerosine oil, the free distribution of quinine and inducing the better classes to protect themselves from mosquito bites by mechanical means to see whether we cannot effect a reduction in the incidence of the disease in these specially affected tracts. This is only one method of attacking the question of how to check malaria, and I hope you will give the problem of how to fight it your earnest attention. I do not propose on this occasion to say much about plague. Between its recognition in Bombay in 1896 and the first year of the present century only 363 deaths were reported in this province from this cause. From 1901 to the end of 1907 the number reported in the province was 1,095,000. The statistics of this disease have recently been dealt with in a published resolution. During practically every month of the past year its attack has been feebler than for six years, and there is certainly hope that we have seen the worst of it.

Of all the vital statistics the most distressing are those relating to infantile mortality. These figures are the index of the sanitary state of a community. The reported annual death-rate of children under one year of age was 229 per 1000 infants born between 1891 and 1900. The figures for the past three years have been 263, 251, and 253 respectively. To some extent the increase has been due to epidemics of measles which have

become prevalent in recent years. In the last three years the number of deaths reported to be due to such epidemics has been 22,000, 44,000, and 80,000 respectively. But, whatever the cause, it is lamentable that one out of every four children born should die before he or she has completed a year of life. Infantile mortality is indeed enormous in every country. Even in England and Wales the annual death-rate was 153 per 1000 infants born between 1891 and 1900, and 182 in 1906. Here, as in England, the mortality among infants is higher in urban than in rural tracts, and specially high in industrial centres, where women work in factories and have to neglect the care of their young children. In Cawnpore the average death-rate during the past five years was 365 per 1000. In addition to the general difficulties in the matter of improving the sanitary surroundings of the people, we have here to contend with the immaturity and ignorance of the mothers, most of them being constantly employed on work both up to the child's birth and while they are suckling it, to the want of skilled midwives, to inadequate and dirty appliances used at the time of delivery with the result of inoculating the child with tetanus, to the prolonged period for which a child ordinarily remains at the breast, to the poor clothing of infants, to their exposure to various sources of infection, and to the neglect of the treatment of their diseases when they are attacked. This is truly a formidable list of obstacles to the growth of a child of the poorer classes to a healthy maturity; and many of them cannot be removed for a long time. But this should be no reason for our failure to look the problem in the face: to my mind it is the most important one to be attacked, if any improvement is to be effected in the health and vigour of the race.

The facts I have just enumerated are depressing enough, even if there is a crumb of comfort to be gained from the success of our efforts in effecting a reduction of the death-rate in cholera, bowel diseases, and small-pox. But hitherto we have only been looking at the death-rates, and if you will turn your attention

to the birth rates you will see reason for thinking that the efforts towards sanitary improvement made during recent years have not been altogether without fruit. Our reported birth-rate is almost the highest in India. During the period 1882-91 it exceeded the reported death-rate by 6·07 per 1000, and in 1892-1901 by 5·97 per 1000; but for the plague it would have during 1902-07 exceeded the death-rate by 8·83, but it actually exceeded it by 4·54 only. It is reasonable to argue that the more than proportionate increase in the birth-rate is to a material extent due to the improvement of the people. If the results of the sanitary measures instituted or undertaken by the Government have not been as remarkable as we could wish them to have been, this is, at all events, not due to any lack of interest in the matter. The question of sanitary reform has, indeed, been constantly before the Government ever since the report of the Royal Commission on the Sanitary State of the Army in India was published 45 years ago. The principle adopted by the Government of India as long ago as 1879 was that it was undesirable to resort to stringent legislative or administrative measures to enforce village sanitary reform, and that until the sanitary condition and healthfulness of towns had been generally brought up to at least a fair standard, and the objects of sanitary reform had become more generally understood, it would be unwise to do more than to endeavour by precept and advice, on every suitable opportunity, to secure improvement of the sources of the water-supply in villages, the systematising and rendering innocuous of the habit of resorting to the fields to obey the calls of nature, and the improvement of the surface drainage of village sites. The experience of the past 30 years has demonstrated over and over again that it is useless to attempt to dragoon the people into taking sanitary precautions. Violent remedies are of no service to sanitary progress: if advance has been slow let us hope it has been sure, since one thing of all others is certain, and that is that it never can be quick. We can never move over the people: we must move by and through them.

A Sanitary Board was created nearly twenty years ago as a consultative body for the province: it was contemplated that, when considering the sanitary requirements of a particular revenue division of the province, it should be strengthened by the addition of members to represent such division. One duty that was expected of it was that it would carry out a sanitary survey in selected parts of the province. Something much more definite than has yet been attempted seems to me necessary in this latter direction. The constitution of the board has been altered from time to time, but its working has not been successful hitherto, and my observation of its proceedings in recent years has convinced me that its system of transacting business has become more and more formal. The Government of India has determined that the time has come when the constitution and functions of the board should be reconsidered, a step which seems to me personally most desirable. In particular it is essential that the non-official community should be adequately represented on it. The Government Sanitary Department consists of a sanitary commissioner, two deputy sanitary commissioners, and a large vaccination staff. It is for consideration whether the department should not be enlarged and its functions extended. In municipalities large sums of money are spent on ill-organised and badly equipped establishments. It is proposed to constitute a sanitary service, the members of which would be utilised for service in the different municipalities. All these matters connected with establishments are among those on which your advice is sought by the Government.

Although laws will not in themselves make people follow sanitary principles, they are necessary to insure the proper fulfilment of rules with which the people have become familiar and generally recognised to be in the interest of the community generally, as well as for raising of funds, and to give legal authority to acts undertaken to improve the public health. I have mentioned the Village Sanitation Act, and the sanitary provisions of the Municipalities Act. There are also Acts relating to lodging-houses, to water works, and to sewerage and

drainage. The Government is about to relieve small towns to which Act XX. of 1856 applies of the charges for police, and their revenues (some three lakhs of rupees=£20,000 a year) levied under that Act will be available for sanitary purposes. This change involves a change in the law and your opinion is invited as to the manner in which this should be carried out. It will also be open to you to consider whether any changes are needed in the Village Sanitation Act or in the provisions of the Municipalities Act regarding sanitary matters, or in any of the other Acts that I have just referred to.

As you are aware, the Government of India made to this Government, beginning with the current financial year, a grant of five lakhs (£33,000) of rupees a year to be devoted to sanitary improvements. I have determined to begin with an endeavour to improve the congested areas of certain of the larger towns by cutting broad roads through them. Schemes are in an advanced stage and will soon be commenced in Allahabad, Lucknow, and Cawapore. I am also providing the Benares municipality, which has done a great deal in this direction in the past 25 years, with funds to cut a single road in the city. We hope to facilitate traffic and the perfusion of air through these cities, to clear out specially insanitary areas, and to erect a few model dwellings on sanitary lines. Some people consider the erection of model dwellings at all to be a work of supererogation. I cannot agree with them, any more than with those who go to the opposite extreme and expect the State to take up the work of house building on an unlimited scale, and to arrange for a general housing of the population of towns in suitable buildings. All that we can try to do is to build a few—a very few—buildings suitable for different classes at a moderate cost, and to look to the public and builders to copy the models. Papers regarding this proposal will be placed before you. So far the great difficulty has not been overcome—viz., that of designing sanitary house for the poorest classes at a cost which will not make its rent prohibitive. Other methods of improving conditions in towns that suggest them-

selves for your consideration are regulations to preserve a minimum space for new houses, to provide for building on standard plans, some form of encouragement to people whose houses are specially well kept, the strengthening of the authority of the health department and the more efficient enforcement of municipal by-laws for sanitary purposes, better markets and more supervision of the sale of articles of food and drink, and more complete drainage and paving schemes which are essential before the benefits of a filtered water-supply can be fully enjoyed. In rural areas the provision of pure water, the drainage of the village site, and attention to simple rules of conservancy are the chief requirements. Here, too, it would be well to have some definite area fixed for all new houses, and if possible to prevent excavations from being made except at a considerable distance from the village site.

Above all, throughout the country we want to teach the people to look after themselves; to educate them in the principles of simple hygiene, and to induce them to abandon insanitary habits. We may pour out money like water on sanitary improvements all to no purpose if we do not get the people to realise that they are for their good. Let us not forget that such success as has been attained in England is due to the general readiness of the people to believe that sanitary regulations, irksome though they may appear, are designed for their good and must be obeyed. By what means can we best lead people of this province to understand this first principle of all sanitary progress? Instruction of the young at schools and colleges will not be without its effect, but what is really needed more than anything is that the educated members of the community should bring home to the poorer classes the merits of practical hygiene. That has been well defined to aim at "rendering growth more perfect, decay less rapid, life more vigorous, death more remote." In season and out of season those who have learnt the lesson that without sanitation there can be no moral or material progress should preach to the public on the text that health means happiness. With stronger sinews

the daily toil of a generation reared under more favourable conditions than those of the past will become more easy. So shall the earth be led more readily to bring forth her increase; here, we may surely hope, lies the road towards industrial progress throughout the land. The goal may appear to be far away, and indeed it is, but let us make a start on the road towards it; I feel sure that we could put no nobler aim before us.

DRAWING AS A PART OF MEDICAL TRAINING.

One fruit of the cessation of war in Europe and North America for a considerable period has been the multiplication of international congresses. During the last three months only, not to speak of the period previous to it, annual meetings of no less than fourteen such congresses have been celebrated. Among this number was a Drawing Congress the third annual meeting of which was held in August last at the Imperial Institute, together with an Exhibition in connection with it, which was opened in the Royal College of Arts and adjacent buildings at South Kensington. The object of this Congress is to encourage the study of Drawing, or the representation of objects by lines and shades, not merely as a fine art but as a means of general culture and as an aid to the trades and professions.

In India there is a tendency to look upon Drawing merely as one of the fine arts—as an intellectual recreation depending on the labours of imagination. In many of the high schools it occupies a very insignificant place in the curriculum, and in the colleges and higher institutions it is neglected almost entirely. This remark is applicable to England also to a certain extent. But in America and the Continent of Europe, generally recognised as the most civilised portion of the globe, Drawing occupies “a place second only to writing in the education of the young, and is regarded as a natural means of training the mind of the child in habits of accuracy and observation,” as a very useful appendage to most of the professions and as “the indispensable language of craftsmen.” (B.M.J.)

Carlyle says, in his usual characteristic way, that Drawing is the most valuable of all studies which are calculated to inculcate a love of truth. It certainly tends to create a habit of close and accurate observation and of patiently delineating things as they are in all their minutiae—a habit very useful in our every day occupations and essentially necessary to success in many of the higher walks of life.

Following the example of English educational institutions, the colleges affiliated to the universities of this country provide for education in arts, sciences, law, medicine and engineering, and Drawing is one of the prescribed subjects in the entrance or matriculation examination. Though success or failure in that subject does not affect the success or failure of the candidate, the usefulness of Drawing is recognised* and a student admitted into the classes of an Engineering College, who has failed to pass a preliminary examination in, or to shew some knowledge of, or taste for, Drawing, has to contend with manifold difficulties in getting on with his studies.

The Engineer has to deal with the principles of construction, and his ideas or designs are carried out by artisans or workmen. It is necessary therefore that these ideas or designs should be explained to the artisans, and the easiest and best way to do it is by lines and shades, that is, by Drawing. In a word, the Engineer's pencil is the guide to the tool of the artisan. Again, one of the most important and interesting duties of the Engineer is to observe and delineate the first signs of weakness in structures whether fixed or moveable, and to record graphically the different stages of it before failure is the result. For all these and other purposes it is essential for the Engineer to be dexterous in the art of Drawing.

* We regret very much to find Drawing omitted from the Matriculation Course laid down by the Calcutta University in the New Regulations as contained in its Calendar for 1908, with effect from the year 1910. As this Art, so essential to the professions, unless cultivated in boyhood, can hardly be acquired in after-life, we would urge the University, which has already recognised its value to the teacher, the engineer and the medical man, to reconsider its decision and restore to Drawing at least the place it has so long occupied, namely as an optional subject.

Teaching as an art is gradually rising in importance and is being built on a broad scientific basis, and a very high standard of qualification for the teaching staff is now demanded by the best educationists of the day, among others by the University of Calcutta, which proposes to grant degrees in Teaching and to have Training Colleges affiliated to it for the purpose of bringing up a sufficient number of properly qualified teachers. As true education embraces, not the development and cultivation of our physical, intellectual and moral powers only, but of our aesthetic faculty also, and as the latter has the beautiful in nature for its field of action, no teacher is deemed efficient who has not some knowledge of Drawing.

In the medical profession where exactness of conception and a habit of close observation are so necessary, the advantages of a knowledge of drawing are very obvious. As the *British Medical Journal* observes (*vide* number for 18th July 1908, page 167).—"The pencil not only develops the mind, but it trains the hand. The child who has been taught to draw well will make the skilful zoologist, the neat histologist, the able anatomist, and the dexterous surgeon. There are many men who have all the mental attributes of great surgeons but lack the necessary manual skill—a skill which, unless developed in childhood, can never be attained in manhood. The hand that takes up the scalpel should have been trained by drawing, by wood carving, by labour in the workshop, or by similar pursuits," and thus rendered fit to give the finishing touch to the superior attainments of the medical practitioner.

The principal subjects taught in a medical institution are physics, chemistry, botany, anatomy, physiology, materia medica, pathology, medicine, surgery, midwifery, jurisprudence and hygiene. A medical student who has a knowledge of drawing, can make sketches of physical and chemical apparatus in his notebook, and these will be of great help to him, when he studies the abstracts of the lectures. Even in the examination, "a good diagram, even though it has no artistic merit, may save him lines of description" and thus enable him to answer the

questions more fully and intelligently so as to secure a high place for himself.

In the study of botany and anatomy the utility of drawing is still greater. No intimate acquaintance with the structure of plants can be obtained unless "botanical sections are sketched, and floral diagrams correctly made." Moreover a sketch may remain fixed in the mind when the verbal description or the actual object has passed out of recollection, and a whole course of lectures may be rapidly revised with the help of an illustrated notebook. With the practice of drawing every object of interest, the habit of correct observation, so very necessary to the medical practitioner as well as the scientist, is gradually developed, as has already been observed, and the student's dependence on his sketches grows with his progress in his biological studies. "In the dissecting room too, rough sketches can be made of each aspect of the dissection, and these sketches can be further elaborated at leisure and the whole collection made into a sort of anatomical album." Each of these pictures will bring the original back to the mind, and anatomical details instead of gradually growing hazy and indistinct will remain fresh in the memory. If these drawings be "supplemented by occasional photographs, which can be stereoscopic if taken with a twin camera," the value of the album will be still more enhanced.

The subjects studied in the later stages of a medical student's career are better attended to in the wards, and here he will find constant opportunities of exercising his pencil to his great advantage. "In the ophthalmic clinic," to quote the *British Medical Journal* again, "every typical fundus should be rapidly sketched, and the sketch should be coloured. The poorest attempt, if made by the observer himself, is of more value to him, with the original ever in his mind, than is the most beautiful painting in an atlas of ophthalmoscopy. In the skin department the moderately skilled painter can collect typical examples of all the ordinary diseases, and he will have his drawings as standards of comparison all his life."

A student who carefully paints the diseases will notice features which an ordinary fellow worker with no knowledge of drawing will overlook. He is sure to attain a successful clinical life, and to push his way into the first ranks of the profession; and if he becomes a professor in a medical school and demonstrates his lectures by accurate diagrams, his pupils will be able to acquire an exact knowledge of the regions demonstrated, and if they copy the diagrams themselves their knowledge will become still more accurate and retentive. The late Professor Sharpey whose name in connection with Anatomy is familiar to every medical man wherever found, had this qualification in a high degree. "The beautiful drawings in coloured chalks which he used to make on a huge black-board will be vividly remembered by the old students of the University College, London."

Again, medicine is one of those progressive sciences which are making rapid strides at the present time. It is therefore most necessary for every conscientious medical man engaged in actual practice to attend to lectures at post-graduate colleges and to keep himself abreast of the advancement of his art by this and other means. To enable him to do this he must have recourse to drawing as one of the efficient means. Thus in every department of the healing art and from many points of view a knowledge of drawing is important to a medical man in a high degree; and an intimate acquaintance with this fine art together with a sense of the beautiful which a familiarity with it tends to inspire, cannot but produce "an ennobling and refining effect on his mind, and contribute to develop that sympathy with sorrow and suffering which is the grandest attribute of the profession." B.M.J.

METEOROLOGY AND DISEASE.

Meteorological Observations taken at 8 A.M. at the Indian Association for the Cultivation of Science, Calcutta.

September, 1908.

Date.	Barometer. (corrected)	WIND.		TEMPERATURE.		Humidity.	CLOUD. Proportion.	Rainfall in inches of past 24 hours.
		Direction.	Velocity per hour in miles.	Maximum.	Minimum.			
1	29.601	SE	3.3	87.0	79.5	89	6	0.25
2	29.744	E	2.3	90.0	80.0	87	6	0.02
3	29.804	SE	2.3	80.0	79.0	85	7	0.16
4	29.765	S	3.5	91.0	80.0	84	4	0.10
5	29.604	SSW	3.9	91.2	81.0	81	7	Nil
6	29.703	S	4.2	91.5	76.0	98	10	0.95
7	29.744	S	1.6	86.0	76.0	88	5	0.83
8	29.781	S	1.5	89.0	79.2	91	7	0.84
9	29.757	S	3.4	90.0	80.0	84	7	0.02
10	29.722	SSW	3.9	91.0	82.0	85	7	Nil
11	29.726	S	3.4	92.0	78.2	86	8	0.42
12	29.723	S	0.4	89.5	82.0	91	8	0.01
13	29.740	ENE	0.7	90.5	80.0	89	7	0.18
14	29.784	SSE	1.7	90.0	80.0	96	8	Nil
15	29.811	S	1.3	88.0	79.6	89	6	1.43
16	29.753	S	1.6	90.0	81.2	88	6	0.15
17	29.725	Calm	1.1	91.0	81.2	89	8	0.35
18	29.777	E	0.8	89.0	81.0	91	8	0.01
19	29.806	S	1.6	89.0	78.0	91	3	1.15
20	29.776	S	1.9	90.0	79.0	87	3	0.45
21	29.745	Calm	2.6	92.0	79.8	85	5	Nil
22	29.768	Calm	1.7	91.0	80.5	76	2	"
23	29.758	N	1.5	92.0	82.0	76	1	"
24	29.727	N	1.8	93.0	82.0	88	8	0.4
25	29.700	Calm	1.7	90.0	78.2	83	2	0.17
26	29.718	E	2.8	91.5	79.0	72	8	0.07
27	29.720	E	2.4	88.0	80.0	91	8	0.02
28	29.816	SE	1.8	87.8	79.0	96	6	0.06
29	29.725	SE	2.2	90.0	80.0	88	8	Nil
30	29.717	WWS	6.6	90.0	81.8	80	7	"
Mean	29.741	47°S 25°E	2.3	90.0	79.8	87	6	TOTAL 7.73

EDITOR'S NOTES.

A Scientific Priest on the dangers of holy water.

The sanitary dangers lurking in "holy water" have often been referred to by medical men. They have recently been scientifically studied by a monk, Fr. Augustin Gemelli, who is himself a highly qualified medical man. He publishes his results in the *Scuola Cattolica*. Each cubic centimetre of holy water in the basins in the church of Santa Croce, Turin, taken from the surface contained 150,000 microbes, while a cubic centimetre taken from the bottom contained no less than 6,000,000 microbes. He injected this water into animals and found that it always killed them, the causes of death being tuberculosis, colitis, or diphtheria. He does not think a daily cleansing with corrosive sublimate sufficient, but recommends a new form of holy water receptacle so constructed that persons instead of dipping their fingers into it can obtain three drops of water by pressing a button. A vessel of this nature has been placed in the church of Vergiate, Milan. Fr. Gemelli turned his attention also to the grilles in the confessional boxes. Water which had been used for washing these only contained 25 microbes per cubic centimetre and when injected into animals only proved fatal to 10 per cent. of them.—The *Lancet*, October 10, 1908.

Reading in bed.

Reading in bed at night is, speaking generally at all events, an unhealthy practice as we have previously had occasion to remark and there is fortunately a tolerably universal consensus of opinion amongst the public that the habit is better avoided. Probably the fear of its being the cause of a conflagration of the bed curtains and perhaps of the whole house has had something to do with the feeling against it in the past, and the danger no doubt was an obvious objection in the days when flimsy bed curtains were fashionable and when the electric light, which is practically free from such danger and which does not vitiate the air as gas and oil lamps do, was not available. Dr. Hugo Feilchenfeld of Berlin has recently made a study (recorded in the *Medicinische Klinik*) of the subject with the object of finding out exactly what harm is likely to result from reading in bed and in what circumstances the practice is most injurious. He finds the chief danger is to the eyes, partly because the light used is frequently insufficient and so placed as to dazzle

them, and partly because it is difficult to hold the book so that full benefit is obtained from the use of both eyes. This is more particularly the case when the reader is lying on one side. Again, there is generally a temptation to hold the book too close to the eyes and this of itself tends to induce myopia. Very particularly is this result to be feared in the case of young persons whose eyes are not fully developed. For this reason boys and girls under 18 should be strictly forbidden to read in bed. Of course, persons suffering from errors of refraction—myopia, hypermetropia, astigmatism, and so on—are liable to increase the trouble by indulging in the practice. Notwithstanding all the objections which can rightly be urged against reading in bed, there are many aged, anxious, worried, and bedridden people to whom it would seem cruel to deny what may perhaps be almost their only luxury for fear of inducing some slight error of refraction. In these cases care should be taken that the light should be sufficiently brilliant the eyes being shaded from it, and that the patient should lie on his back with the head and shoulders raised. In this way the dangers may be minimised. Referring to reading in bed in the daytime in ordinary cases of illness, how often do we see a patient, the foot of whose bed is towards the window, struggling with a book or newspaper held between himself and the light so that his eyes receive the glare of full daylight while the only illumination of the printed page is that due to the diffused light in the room! A suggestion that during the daytime or part of the daytime the patient's head, together with the bolster and pillows, should be transferred to the foot of the bed is often gratefully received, as not only is reading rendered much more pleasant but the change of position and of aspect night and morning is almost always agreeable, relieving as it does to some extent the irksomeness of confinement to bed.—*The Lancet*, October 10, 1908.

CLINICAL RECORD.

Foreign.

CLINICAL CASES.

By E. A. TAYLOR, M. D.

Case I.—*Metrorrhagia*.—Miss W., aged 31, had uterine hemorrhages some years since, for which an operation was performed, consisting of the removal of several uterine polypi. This corrected the trouble for some months; it then returned as bad as before. A second operation was productive of similar results, and the surgeon consoled her with the statement that she might have to have an operation once a year.

The symptoms were as follows: Hemorrhage of bright red blood, comes in gushes, followed by a clot. The hemorrhage would cease for a short time, then start again, sometimes worse than others, but never ceasing entirely for any length of time. As she expressed it, she never knew when her monthly periods came—she was sick all the time. She was exceedingly nervous, there was much twitching and jerking of muscles, and she was troubled with insomnia; some nights would not sleep at all. The flow was worse from motion and very offensive.

She was pale and anæmic; any emotion, pain or apprehension would cause her face to assume a death-like pallor. The bowels were regular but the appetite was poor, except for certain things; she craved pickles and stuffed olives, would eat ground coffee by the spoonful and used much salt, even salting her pie. She had a sensation as if the white of egg had dried on her face and the skin would crack if she were to laugh. She drank a great deal of water and was fond of lemonade. Mentally she was greatly depressed; could not tell her symptoms without crying, and when I attempted to console her, assuring her that she could be cured, she put up her hand protestingly, saying, "Don't! don't! if you talk that way I shall never quit crying."

Her headache was in the temples, worse in hot weather; was of a throbbing character, seldom associated with nausea, but was worse from light and noise and from sleep. She wanted to do everything in a hurry and would frequently drop things from her hands. She craved the fresh air and felt better out of doors. She frequently puts her tongue out while talking as if to moisten her lips, and says she is always hungry with the headache.

She received nat. mur. im, one dose dry on the tongue. In twelve hours the hemorrhage had greatly decreased and in thirty-six hours it had ceased. From that time on she menstruated regularly and normally. The dose of medicine was given five years ago.

Several remedies might be thought of. For the pronounced anæmia with the mental depression, weeping, nervous and hysterical state, intermittent flow, etc., one might think of ferrum, but the ferrum patient's face, while very pale while she is in a tranquil state, becomes fiery red on any disturbance; mental or physical, while this patient would take on a death-like pallor. The craving for sour things would contra-indicate ferrum, which loathes sour things. The amelioration in the open air, desire for sour things and tearful disposition might make some think of pulsatilla; but pulsatilla likes consolation—this patient did not; pulsatilla is thirstless—this patient was very thirsty; to the pulsatilla patient everything tastes too salty—this patient covered her food with salt, even her pie. So giving particular attention to the peculiarities of the mental symptoms as Hahnemann directs, the symptom-complex led to natrum mur. and the result was all that could be desired.

Case II.—RECTAL FISTULA.—Mr. J. M., aged 38, came to me for examination and treatment. He said that for two years there had been a "leakage" from the rectum and he had been compelled to wear a pledget of cotton to absorb it. On examination a fistulous opening was found about one inch from the anus through which a probe could be passed into the rectum. He also had hemorrhoids which were more pronounced on the right side.

He had had gonorrhœa years ago, for which he had taken old-school medicine externally, internally and eternally, with the result that the hemorrhoids developed, together with obstinate constipation, bleeding from the anus during stool, long lasting burning after stool and a sense of awful constriction of the anus, which would last for hours and often kept him awake all night.

His pulse was slow, often 54 when quiet, and his urine had a very strong odor and was highly colored. He received benzoic acid, 30th, and this remedy cured him in less than a year. The fistula healed, the hemorrhoids, rectal pain and distress and the constipation all disappeared and have not returned after ten years. In this case there was little chance for doubt or comparison, for to one who is familiar with the action of *benzoic acid*, the picture is so striking as to be readily recognized.

Case 3.—**OVARIAN TUMOR.**—Mrs. K., age 32, married six years, no children. Husband is healthy and denies any venereal taint. Mrs. K. has been troubled for more than a year with sharp, stinging, shooting pains in the left ovary, which have been growing worse and distress her greatly at times, but she is always relieved during the menses. There is some pain in the right ovary at times, but not nearly so much as in the left. She eats well, sleeps well, looks well and her bowels are regular. I inquired about her desires and aversions but could learn nothing of importance. I asked if she ever drank any beer or wine, when with much animation she told me that she dared not touch wine, that one swallow would cause such a commotion and distress in her ovaries that she could scarcely endure it. She said, "it seems the effect all goes to my ovaries."

She had been examined by three good old school doctors who said she had an ovarian tumor and must go to the hospital at once and have it removed. I examined her and found the left ovary as large as an orange, sensitive and painful to pressure. The right ovary was not enlarged.

She received *sinuum met.* and in less than a year no tumor could be found, she was free from pain and well.

Case 4.—**EMPHYEMA.**—One evening several years ago a homeopathic physician who is an excellent prescriber, telephoned me asking me to come and see his son eight years old who was ill. On inquiring what was the trouble he replied "he has pneumonia, this is the nineteenth day, he is getting worse and I fear he is going to die." I hastened to his home, where I found the boy pale, thin, restless with many symptoms pointing to many remedies. On examination the left side of the chest was seen to move less with respiration than the right, the intercostal spaces on the left side were obliterated, there was flatness on percussion over the lower two-thirds of the chest on that side, with an absence of vocal resonance and tactile fremitus over the area of flatness. The heart was displaced to the right and he had a temperature of 103 with increased respiration and pulse rate and frequent sweats. I advised the doctor to get a surgeon, which he did; a rib was resected, a great quantity of greenish, offensive pus evacuated and drainage maintained. The temperature fell within a few hours and the boy made an uneventful recovery. What would have been the result without surgery?

Case 5.—EMPYEMA.—J. S., age 12, had been ill for some weeks, under the care of an excellent prescriber of our school, when I was asked to see him in consultation. The appearance of the patient, the history and the physical signs were each the same as in the last case, only the trouble here was on the right side and in the right mid-axillary line at above the fourth or fifth interspace; there was a pronounced bulging as large as one's fist with fluctuation plainly perceptible. The diagnosis was empyema; the treatment advised, surgical. This was about ten o'clock at night, and about two in the morning the doctor was called to find that the pus had broken into a bronchial tube and the boy was expectorating great mouthfuls of pus. A surgeon was called who made an external opening and drained it, and he seems in a fair way to recovery. How much better it would have been had the surgeon been called early.

Case 6.—OSTEOMYELITIS.—Mr. W. S., age 20, a well developed, well nourished German laborer who could not speak much English, was taken sick with what was thought to be pneumonia. I saw him after he had been ill a few days and he had, in addition to a temperature of 103 with pulse and respiration somewhat increased, a severe pain in the left arm on the outer part above the elbow. It was red, circumscribed, swollen and wonderfully sensitive to touch; the pain was intense all the time, but very much aggravated by touch or motion. He kept the arm bent at a right angle all the time; the pain was so intense, he would tremble all over at times and could not help crying. The pain and swelling were not in the joint, but a few inches above it.

I advised the doctor who is a homeopathic physician, to call a surgeon, saying I considered it a case of osteomyelitis, but the doctor thought it was rheumatism, and continued to prescribe what seemed to be the indicated remedy. It was only after some days' delay, when secondary infection had manifested itself in the other arm, both legs and elsewhere, that the gravity of the situation was realized and a surgeon called; pus was evacuated from many places, but too late. The patient died. An early operation might have saved this patient's life. It is not as culpable to neglect surgery when needed as to use it when not necessary? A time for everything and everything at the proper time should be our motto, and we should know not only therapeutics, but diagnosis and surgery also—be doctors in the fullest sense of the term.—*The Medical Advance*. October, 1908.

Gleanings from Contemporary Literature.

AN ADDRESS ON HOSPITALS; PUBLIC MEDICINE AND
MEDICAL STUDIES.

By SIR T. CRIFFORD ALBUTT, K.C.B., M.D. CANTAB., HON.
D.Sc. OXON., F.R.C.P., LOND., F.R.S., &c.,

GENTLEMEN,—It is one of the noble attributes of the human mind never to rest contented with an achievement, be it never so useful, never so glorious. The old Manchester Infirmary, which happily escaped the division so injurious to some other hospitals, was as famous in its great physicians and surgeons, and in its generous and enlightened benefactors, as in form it was stately and in its history monumental. Yet the mind of your citizens, thankful as they have been for a great past, would not rest contented on form and history; gazing still insatiably into the future, contemplating the new scope and potencies of modern medicine, both personal and national, reading the principles on which this progress had been, and is being, made, and the signals of these ever-widening ranges of knowledge, power, and beneficence, Manchester men, in alliance with their University, are inspired to build yet more stately, to endow more richly, and thus to organise that still vaster compass of charity, of learning, and of municipal and national efficiency which I have visited and to which I have the great honour of bearing witness to-day. Thankful, nevertheless, as I have said for a great past; but while these words are passing my lips the most ardent pilgrim will pause for a moment as, in the visions of his memory, are reflected the figures of those strong companions who so lately were breasting the hill with us, but whose hands are now dropped and whose familiar and prophetic voices are fallen into silence. Manchester and Manchester University, even after the loss of such men as Leech, Dreschfeld, Harris, Ashby, Cullingworth, Jones, Collier, will be more and more; notwithstanding we are haunted by the pathos of human life and death, wherein they, who of all of us knew best how to rejoice in your new hopes and new promises, have lately been taken from us; and we are left to rejoice, if by no means alone, yet without their wise counsels, without the enthusiasm of their presence. And yet I repeat "by no means alone." It is indeed the older men, such as he who now addresses you, who see most vividly, and feel most keenly that the fountains of life ever renewed, and of progress reinforced and accelerated, have their springs not in our generation but in the bands of eager young men whom year by year and day by day your University bears in its pride. And if sometimes in their naughtiness these ardent youths are inwardly disposed to scorn our ingatherings, to despise our experience, and even to hold our wisdom in suspicion,—well, it is better than if they had fed themselves with our formulas and fondled our idols. Social development has always been discontinuous, and a succession of slightly explosive generations is better than the alternative of revolution, of catastrophe by longer accumulation of pent up stresses.

HOSPITAL MANAGEMENT.

Permit me on the threshold of this new infirmary to make a few remarks on hospital purposes and management. Of the management of the Manchester Infirmary I know nothing, and under this head no word of mine can be charged with censure or innuendo. I speak generally when I say that a prevailing error in hospital government is the failure of the lay managers to act in frank and equal partnership with the medical managers whereby the full co-operation and best results of money and knowledge are more or less sacrificed, the machine runs with needless

friction, and occasionally jams. In this matter the lay governor is a little apt to be arrogant, a little purse-proud. Yet, after all, money is but the raw material, to be worked up with knowledge. Upon a hospital board laymen, even wealthy laymen, may come and go and be noted of no man; whereas such changes in the hospital medical staff would be promptly disastrous, for the layman's hospital is a stationary hospital.

That money is of more value than knowledge is a vulgar and erroneous notion; yet in our partnership too often the lay manager presumes that the physician or surgeon is at the hospital not his partner but in some sort his servant. Occasionally indeed he is ungenerous enough to depreciate the equal benevolence of the medical services on the ground that if unsalaried they "pay" in profit and reputation. But do we find that in other professions public officers as a clerk to justices, for instance, as a solicitor to a great banking company, as a consulting engineer or chemist to gas or water works—are unsalaried, because the office carries with it opportunities, reputation, and fees! By no means. The other day I asked a distinguished physician and a distinguished surgeon on the staffs of two leading London hospitals if it paid them, however indirectly, to devote thus their priceless services for the sick and for the raising up of successors like themselves? They answered almost in the same words, "The time I give to the hospital costs me 20 or 30 guineas a week"—surely a more than ample pecuniary recompense for any promotion in earlier years. Moreover, even in London, and more generally in the provinces, a man of parts and address, starting independently of a hospital, has opportunities of material gain on the average as good as, and quicker in return than those of his fellow student who, more disdainful of commercial balances, at the hospital devotes himself in the first instance to science and charity. Yet it is on these men that the virtues and the honours of a great hospital chiefly depend.

Let us put it more plainly; a lay man, with a purse in his hand, and a physician stand on either side of the bed of a sick man. The layman offers to spend £ 5 on the patient if the physician of his learning and benevolence will convert this cash into means of solace and cure. Neither partner is of much use to the sick man without the other. The man with the banknote cannot, it is true, allow the physician to spend the money uncontrolled; but on the other hand, without the physician his money would be wasted. The partners, then, are not master and servant, but comrades; and if with many banknotes and many patients a great healing engine is created, the principle of frank and equal partnership is not modified. If the expert, after the manner of experts is prone sometimes to forget the relative proportions of things, to push ideas beyond the limits of common sense, to be importunate, or even extravagant, the layman on his side is as prone to be domineering, meddlesome, and short-sighted. Everything in the healing machine costs money, and the layman must regard the ultimate economy of it; but as everything in it also therapeutical whatsoever he may do or avoid affects more or less directly the treatment of the patients; whether it be, let us say, the heating and ventilation, the decoration of the walls, or even the baking of the bread and the quality of the blankets. Unless, then the lay manager keeps incessantly in touch with the medical he will continually make little mistakes and large blunders. Now do we, generally speaking, find this broad and continuous counsel between these partners in large hospitals? Do we not too often find on the contrary a lay board shutting itself up by itself, and week by week proceeding to business without conference with the honorary staff; acting, indeed, sometimes as if the staff existed only to do what it is told; a custom surely discourteous as well as mischievous to the business the two partners have at heart. How, then, should concord, mutual under-

standing, and harmonious and efficient cooperation be maintained? At Leeds every member of the honorary staff is, *ex-officio*, a member of the weekly board; thus at every board one or other of the staff is sure to be present; so that if any innocent-looking proposal be made which in so complex a machine might react prejudicially upon the welfare of the sick, a warning note is heard, and the proposal is deferred or modified. Larger issues are discussed, on due notice, by full boards of lay medical members, with frank and equal interchange of opinion; but the staff vote is properly limited,—in my day to eight, the eight votes being readily distributed among the staff at the discretion of the members present; votes being of course, allotted first to the members of any special department chiefly concerned in the issue. The result during my experience was that no cool breezes chilled the cordial partnership between board and staff in that successful hospital; nor was there any loss of efficiency by cross purposes or conflicting opinions.

The next counsel I would offer is that a lively and effective sympathy be manifested with scientific aspiration and invention, even by lay managers who may be unable to perceive the purport of particular, or indeed of any researches. To speak personally, I shall never forget the almost comic astonishment of a certain weekly board to whom some 40 years ago I appealed for a very modest outfit of electrical scientific apparatus, and at a later date for means of registering surface temperatures by electrical thermocouples, of recording continuous curves of bodily temperature by watchwork, and so forth. Bit by bit I did indeed get something of what I wanted, but with a delay and tediousness that crippled my endeavours. Now, I pray you to believe that no money is better expended than small sums allotted to investigation by young men of scientific ardour whose education in method is fairly adequate. If it does little more than keep the junior staff and their pupils active and curious the outlay is well rewarded.

CLINICAL PATHOLOGY.

And thus I am led naturally on, not merely to urge in general terms the alliance of clinical medicine with scientific research, for this is a counsel not needed in Manchester, but to advocate in particular a far closer intimacy and cooperation than at present exist between the physician and the pathologist. Since a few of us, some years ago, began to urge the creation of clinical laboratories close to the doors of the wards, something no doubt has been done; but it has been done, in my opinion, awkwardly and very partially. Herein I think the medical manager, as sinning against the light, is more to blame than the lay, so that the pathologist—I speak not now of morbid anatomy which has long enjoyed every advantage, but of pathology in its dynamic aspect—the pathologist in this sense is kept aloof from the patient whose processes it is his main business to interpret; and the physician, with morbid anatomy nearer his elbow, has been losing something of the sense of disease as dynamics, which, with all their fantasies of vapour and humour, was apprehended by our ancestors of the last two or three centuries. Of late years a remarkable integration has begun, and is rapidly proceeding, between anatomy and physiology; and, if medicine is to advance as it has been advancing, the same integration must be created between static pathology, medical practice, and dynamic pathology—the pathology of processes. That the pathologist must investigate the sick man in whose body these defects and perversions are at work seems too obvious for assertion. Yet when some few months ago I asked, somewhat ironically I fear, of a distinguished pathologist in a great university if he had free access to the wards of the hospital, he replied “If I were to set foot in the wards there would indeed be a pretty hubbub in the staff.” So the pathologist,

at arm's length in a laboratory down the street, working, as it were, in a balloon, and fed upon occasional crumbs from the hospital table, never sets eyes upon the concrete problems which it is his business to solve. There seems to be an opinion abroad that the pathologist, who has never approached a patient since his graduation, can by some esoteric ingenuity put together the conditions of these problems in his laboratory; or indeed under these purer conditions find more comprehensible explanations. To endeavour in the laboratory thus to reproduce problems in simpler terms is a valuable part of scientific method; but surely it is a truism that such researches, unless incessantly tested by the touchstone of nature, are apt to lead at best to conclusions as abstract as the ingenious conditions out of which they arose are artificial. In the simpler sciences, it is true, such methods go farther; a mathematician, in no way conversant with machines, may often enlighten an engineer; but even in the simplicity of mechanics the shortcomings of mere academic methods soon become conspicuous: how much more crippled then must be the academic pathologist who is denied full converseance with those infinitely more complex and multifarious machines we call plants and animals! It seems absurd to labour such a point as this, and in a university so vigorously empirical as Victoria; still as we have long ceased to be surprised at the absurdities which convention and tradition maintain even in the hardest heads, even here these counsels may be useful.

How, then, are we to abolish so fallacious a distribution of work? The physician, who in the earlier phases of scientific medicine proved himself, on the very principles just proposed, to be the ablest of pathologists, can no longer, in the vast extension of the field, devote himself fully to pathological research. It is all he can do to coordinate its discoveries with clinical practice. Moreover, the field of qualitative clinical work is filling up, and progress now depends on the far more arduous and exacting quantitative appreciations. Both physician and pathologist, each by his own methods, must work in the ward at the facts; the pathologist must have almost as free a run as the physician—almost as free, for ultimately, of course, the physician must govern all that concerns the patient's well-being—and must accordingly have a laboratory of first instance in the neighbourhood of the ward; his departmental and research laboratories will, of course, be elsewhere, yet not so far away as to estrange him from the patients. By this concert the outlook of the physician himself, his assistants and his classes, would be continually enlarged, and the attention of the pathologist as continually riveted upon those signals, criterions, contingencies, interdependencies, eccentricities, lapses, glimpses, which in the laboratory no ingenuity can forecast or reproduce, but in which the practical and empirical physician has his being and justification.

And what is true of the hospital is no less true for private practice. It is not fair to the pathologist, it is not fair to the patient, in cases, let us say, of biochemical disorder, of vaccinal therapeutics, of obscure toxic processes, and so forth, to pick the brains of the pathologist at second hand. The pathologist should be summoned to take his proper part in consultation, with the family physician, and any other consultant, all upon equal terms. So far as circumstances and the old customs of private practice permit, it is my endeavour to bring this about, and, if expenses must be kept down, the medical consultant may be permitted to resign a few of his visits to the pathologist, who, by the way, is anything but a rapacious person.

OUT-PATIENTS.

Of the departments of a great hospital that which is most rudimentary, rudimentary almost to chaos; that in which the evil, which in this world attends upon the good, survives most manifestly, and is perhaps increas-

ing; that which on many grounds is open to the censorious criticisms of medical men outside its walls and of the public, and indeed of the hospital staffs themselves, is the out-patient department. Physicians resent all that savours of quackery, at any rate in medicine; yet is there any custom more apt to engender and to foster quackery than to encourage mobs to wander round our halls for potions to be hugged to their bosoms as charms? In not a few cases, it is true, these herbs and salts have some virtue; but in how many are they not stock recipes, either wholly futile or at best impotent as auxiliaries against unwholesome habits and conditions of life which the physician, unable to ameliorate, gets weary of denouncing? Too soon he learns to say to himself, "Poor creatures, errant or sinful, God help them, I cannot; yet if pill or potion be a comfort to them, or a hope, by all means let them have it." And the quackery does not end here; unhappily it permeates upwards into higher social ranks, to the degradation of scientific therapeutics.

In respect of the out-patients, hospital abuse, by persons able to pay for advice, is perhaps exaggerated; still, by direct provision or by means of provident dispensaries, some of them might be induced to obtain the more individual and discriminating aid of physicians living among them; conversant with them and their ways, and with the external causes and conditions of their maladies. Thus, by treatment of a more comprehensive kind on physiological lines, vulgar notions of the laws of life and disease would be enlarged, and some health would be compassed not for the body only but also for mind and character.

Hitherto I have been considering the out-patients of Great Britain as hordes; but at the same time I am not forgetful of the precious gifts of diagnosis, and even of treatment, which thus fall to the lot of many of them, as to persons overtaken by acute or vexatious diseases, but who, even if fully aware of the nature of the case, are unable or unprepared to pay for medical aid. Many sufferers are thus consigned to the wards; and on discharge are kept still under supervision; others are benefited by topical remedies, specific drugs, or elaborate technical methods, such as massage, electricity, x rays, or medicated baths, which in general practice are out of reach. Again, in respect of diagnosis, there are poor patients as well as rich whose maladies are obscure in nature or difficult to manage; patients who may have made, and be making, payments to a medical man, but are quite unable to add the fees of a consultant or the charges of costly methods of cure. Even in the poorer families of the middle-classes serious illness is a grievous or even a crippling expense, especially in these days of elaborate and costly therapeutics, against which some more orderly provision is sadly needed. As things are, these important cases are more or less swamped by the horde.

How, then, is the out-patient to be organised for efficiency, and with respect to the general practitioner, who in these latter days has become far too competent a man to be ignored? Time permits me to consider one part only of the problem. It has been proposed that access to an out-patient department shall be only by the introduction of a medical man in the district. This is too narrow a proposal. To deny a ready relief to the sick and needy who have no doctor, or know none, or in any cases are unable to pay for his intervention—in cases, for instance, of incipient acute disease, of infections, or more insidious maladies—would not be, and ought not to be, tolerated by the public, whether in the name of charity or of civil order. Moreover, the delicate question must arise, how fairly the general practitioner would play the game. As things are, the ill-paid "club doctor" often, and not unnaturally, declines to add to his bounden duties; nay, the physician who resents a hint at "further advice," or sniffs at it when obtained, is not quite extinct. Again, what

about the time, the trouble, and the comparative ineffectiveness of brief notes or messages ?

The proposal as it stands, then, is narrow and impracticable; yet it touches an important principle, especially as regards cases of difficult diagnosis, those again which need costly methods of cure, and afflicted persons who have paid fees but can pay no longer. To encourage family doctors to refer to the hospital patients of these two classes is then the duty of the managers; and for the cases of difficult diagnosis or treatment I suggest that the need would be met by the appointment at every hospital, and in each department, of an invariable hour when the outside physician and his patient could rely upon a consultation with one or other of the honorary staff in his respective department. These hours should be fairly frequent and invariable; the busy practitioner cannot be counting days and hours, he must be able to say offhand when John or Mary shall meet him at the hospital gates. There he would probably meet others of his brethren on similar errands; and if all could join in each consultation they would derive for themselves as much of interest and experience as of advantage for their patients. Such a system would surely extend itself in many incalculable ways; it would offer a fertile field for the younger consultants, raise the value of medical methods in the eyes of the public, and tend by example to reduce the burden of hangers-on and of routine prescribing among them, and even, perhaps, of vague discontent and quack-hankering among the well-to-do. I will only add that on the medical side provision should be made for consultation in cases of mental disease also.

MEDICINE AND THE STATE.

There is no doubt some discontent in our profession that Medicine has not the rank and consideration which are its due; such as are accorded for example to the Church, the Law, the Navy and Army. Now in so far as any such uneasiness is engendered of petty personal ambitions we need not dwell upon it longer than to recollect that we shall attain to the social consideration we may deserve by the self-respect which ignores the trivial conceits of the day, which is quick to think for others, slow of offence. But this is not all. The physician, if a somewhat touchy person, is not arrogant; the discontent lies deeper and springs from more honourable motives; from a nobler jealousy for our calling, its achievements and services; from a restless sense of great powers not finding their full play and responsibility in the national functions and counsels. Thus regarded, our discontent may be justified, and desire only what is due to the honour and interests of the commonwealth.

Now there must be some reason, if Medicine has failed hitherto to rank with the other great services, why this is so. The answer is not difficult: that in so far as we are concerned only with individual pains, in so far, as some naughty wit has put it, as we are but plumbers and glaziers of the individual body, we have neither place nor claim to public recognition. It is in respect of our concern with the larger issues of public health that our service and responsibilities become of national importance. In this respect, however, until yesterday and to-day we had not the knowledge to justify our vocation. The history of Medicine, broadly speaking, is melancholy reading; it is a record of devastation by pestilence, deplorable blights upon family life, and catalogues of medical formulas and practice as prodigious as the plagues before which priest and physician alike vaunted themselves in vain. Open the pages at hazard, perchance at John Evelyn's story, but a common instance of a common fate. Of Evelyn's nine children a son and a daughter only reached adolescence, and one of these, in the words of Jeremy Taylor, "that pretty person your strangely hopeful boy," was then cut off also; the daughter alone

survived him. As in some classes even yet, in all classes then, such disaster was rather the rule than the exception, and the people went upon the facts accordingly: the fighting men, they more or less consciously argued, make us into a nation; the lawyers bring order into our midst; the Church has fostered learning and religion; it is the no less high vocation of medicine before commerce, before other subsidiary ends, to conserve and fortify man's body, the tabernacle of this prowess and this wisdom—the tabernacle, do I say? may in the words of Dr. Caird, St. Paul's dramatic contrast between the flesh and the spirit had but a temporary and rhetorical meaning, like the contrast between matter and energy; the body, spiritually considered, is the immediate organ and instrument of the soul. To maintain this organ and instrument not in the individual man only, but in the social body also, was the vocation of medicine, but science had hardly come to the birth and applied biology had not even been conceived. Medicine could not humbly wait for science, as science was waiting for the experimental method; competent or incompetent, she was forced to the front. Her pontiffs, therefore, strewed before the people chiefly some withered branches of tradition, and the Dead Sea fruit of a curious but mostly grotesque and unregenerate folklore. In the Middle Ages, indeed, great men could not fight for clear causes; they were confronted not only by truths in array one against another, but also by monstrous regiments of error and fiction—regiments to be mown down by the artillery of experiment, as feathered savages before the hail of the machine gun, but till then irresistible. Not till our time and with these arms victorious could Medicine advance; but now it is moving so quickly that, borne on by the moving mass, we do not perceive the speed until we look back to see whence we have come. The belated knowledge is won. To-day we can answer bravely to our invocation. We are commanding the ear of the nations and solving their problems with deeds and revelations so triumphant that in their quandaries, even our unidea-ed governing classes, who had fallen to a belief in "compromise not as politics but as an excuse for routine," and had satisfied themselves of the efficacy of ignorance, are now compelled, bit by bit, to yield us some brusque and clumsy heed, to bully and then to knock under. For from the hands of our leaders the kings of the earth and its merchants have received the keys of Suez and Panama, the gates of the hemispheres; their wardens, the twin ogres of malaria and yellow fever, being by our art if not dead yet toothless and impotent as Pope and Pagan; we have tortured the secret out of the demons of tuberculosis, sleeping sickness, plague, Mediterranean fever, wool-sorters' disease, cerebrospinal meningitis, tetanus, syphilis, puerperal and surgical fevers—need I prolong the list of these modern discoveries, so brilliant as to shine best by their own light?—and where we have not yet extorted the whole secret, as from smallpox, scarlet fever, infantile diarrhoea, hydrophobia, we have so far mastered the tactics against them as to be reducing them to phantoms of their former malignity. Sadly late then as we have come into the field, we are in time to be the saviours of the nations as well as the guardians of the family; and to endow mankind with vast and fertile territories hitherto under the desolation of disease. Yet to be ministers of a newborn profession is not all loss. When Athene sprang full-grown from the head and heart of Zeus, were not the Olympians at first a little disdainful and aloof, and the divine maid a little wondering and shy? And probably the ægis was not quite ready; these artificers are always behindhand. Is not Medicine, born full-grown from the womb of our own time, if a little wistful at first, spared the hamper of a long past? Her gospel is not hidden behind an ancient and creaking machinery, nor are her eyes bent away from the future by a huge inheritance of

undigested facts and opinions. The engineer, it is true is a new demigod, but he deals with far more elementary things; with means, not with ends. Joyfully we are putting on a hundred legs for one in the hope of escaping from ourselves, yet so far it seems very much in vain.

MINISTRY OF HEALTH.

What is now needed in England is no halt by our leaders, but the establishment of a General Staff of Medicine, to rebuke the purblind and inveterate habit in our countrymen of devoting their magnificent energy and their treasure to mopping up effects, in disregard of causes; to teach them better than to hustle each other with fussy, belated hurrying to and fro after evils have surged to a head, as, for instance, in the calamity of plague in India and in the typhoid disaster in South Africa; calamities no longer mysterious, noonday pestilences concerning which the modern physician had ample foreknowledge. Yet with all this knowledge, and infinitely more parcelled out in the several closets of the older ministries, or submitted to the patronage of selfish and awkward local authorities, generally coarse and inconsistent in their methods, and sometimes corrupt, medicine, as a function of the State, is still working as it were with her left hand. Her scattered official members have no unity; working piecemeal everywhere she has no coordination, no integrated self-consciousness. With no fixed apparatus for concerned action, energy is wasted in overlap, in jostling, in divided purposes, and in anomalies. Although her influence has penetrated into almost every function of society and directly and indirectly she is spending a great revenue, yet through the counsels of the nation she passes veiled and irresponsible. The new ideas which are stirring society are largely medical, yet society does not know where, in the back staircases or garrets of the Local Government Board, of the Home Office, of the Education Office, of the Board of Trade, of the Post Office of the Registrar-General's department, of the Lunacy Commission, and so forth, each bee buzzing in its own little cage, medicine is to be found; nor how this new solvent and all-pervading influence are to be brought to the back of revenue or to the bar of public opinion and responsibility.

Our Charge.—Let us consider, but for a moment and in outline, the charge of medicine in normal national functions. Abroad public medicine, which short-sighted people seem even still to see only through the taint and clatter of "hygienic" trade advertisements, public medicine, to which private practice must begin to play a subordinate and tributary part, has stretched out its arm beyond the several nations, is transforming the quarantine of man, animals, and plants, and creating a vast and masterful international service. At home to public medicine is intrusted, in the first quarter of life, the reckoning of births; the protection of infant life and growth; the valuing of each generation by comparison with the past and with normal standards of physiological institution. The new measure of medical school inspection, a far-reaching measure the full purport of which as yet the country has but little notion, the physical and mental conditions of education, the "half-timer," and night-school problems; in later life the conditions of labour, the dynamics of food and the minimum wage, the how and the why of premature old age, the effects of degrading and stupefying labour, and the time incidence of old-age pensions; factory inspection, with estimates of the effects of particular trades, such as chemical works, mining of all kinds, metal grinding, and so forth with their consequences and pecuniary compensations; and more broadly, the large problems of "eugenics," of housing, of home life, of ventilation, of water-supplies, sewage and rivers pollution, food markets, and the adulteration in Eng-

land so rampant, and, furthermore, those amenities of life, especially in cities, which by their play upon the receptive organs of the mind, make for the temperance and harmony which are essential to health and function. Such, in the sphere of the normal, are a few glimpses of the functions of modern medicine.

If now we turn from the normal to the abnormal, we may as rapidly note the survey not only of the tides of epidemic diseases in the largest sense of man, animals, and plants, but also of the more chronic but no less mischievous diseases which in a large degree depend upon defect or vitiation of the conditions of social life; the proclivity to reversion and degeneration which is the shadow of evolution; the prevention and treatment of feeble-mindedness and insanity, which after mountainous waste of means is hardly begun; the great problems of hospitals and sick asylums; the urgent problem of a provision for medical and surgical treatment for large classes above the very poor, upon whom long and costly illness falls with a crushing weight and by whom in any case the consummate therapeutical apparatus of hospital charity are unattainable; the working of the Poor-law; the campaign against drunkenness, fornication, and other venomous social vices; and thence to criminology and punishment, to toxicological and expert medical testimony, to the anomalies of coroner's courts which in the crudity of their procedure would seem to exist rather for the destruction than for the corroboration of evidence; and finally, to the antiquated and distrusted dogmas of the judges of the higher courts on responsibility before the law.

Now this is the baldest of sketches, yet does it not indicate that modern medicine is embracing not indeed the final purposes and issues but the springs and conditions of national and universal life and efficiency; yet while the central administration remains as acephalous as the peripheral parts are multifarious and incoordinate, can we wonder that ignorance, confusion, and vacillation still prevail? The medical officer of health is at the mercy of the caprices of any interested clique; his sphere is undefined, he has neither protection nor freedom. In the service there is no order of promotion, no assurance of pension. Thwarted in detail, and in no public cooperation with a consolidated service, he is apt to lose standards, to lose efficiency, and to lose heart. Without an organised State department, public medicine lacks the corporate sense of a great official body like the law, and the stability of the coherent social groups which are favoured by natural selection. Moreover, being human, its partial conceptions, cross purposes, and pedantries are thus unmodified; and its naturally strong positions are not fortified against lay criticism; so that the public does not feel at home with medical ideas and practices. Working behind the scenes it loses the discipline and the chastisement, as well as the honour of public responsibility; while in the words of the President of the Royal College of Physicians of London, "the State thrusts upon us responsibilities which are not ours." Unrepresented by a Minister of its own in Parliament, by alien Ministers it is alternately used and betrayed; and in silence must submit to hear its motives misinterpreted, its methods mishandled, and its unrequited labours continually imposed upon.

To one more factor of medical organisation I can but allude, although it lies at the root—I allude to the making of knowledge, knowledge of all national stores the most precious, in spite of the overlords of society who, as I have said, cling still to a belief in the efficacy of ignorance and delay. Grave towards us as are the faults of the Local Government Board, we must gladly admit that in this department some research is fostered. It is clear that there must be administrative laboratories and that without the atmosphere of disinterested research the best labora-

ories must flag ; still it is open to inquiry how far the State shall make knowledge for itself and how far it shall derive it from universities and other scientific bodies. But when, for science or for art, money is wanted we learn that we are the poorest nation in the civilised world.

What are we to propose, then, in reform of the services of public medicine ? It is understood that in high quarters the desire is to begin with the chaotic and inefficient periphery, in the hope that, secondarily, evolution may reach, recreate, and coordinate the subcentres and the main centre. It is urged also that each department must have its own medical bureau for its own continuous guidance and instruction. Again, there is the conventional dread of medicine as of all irresistible knowledge ; and a proneness to the sinister device of "*Divide et impera.*" Moreover, the English public has a wholesome dislike to the multiplication of officials ; but by organisation the number of officials at any moment would be diminished rather than multiplied. It is true that each department would still need its own standing medical counsel as it has its standing legal counsel ; but how far more valuable would such a councillor be when speaking from the consolidated opinion of a corporate and disciplined medical Ministry than as an isolated medical colleague expressing no more than individual opinion. The crying need of reform in the separate peripheral areas must be freely admitted ; and Dr. Bushnell is correct in attributing to me an "apprehension of harm in excessive or premature centralisation, lest the central machinery be too powerful for the peripheral equipment." But, on the other hand, without parallel development, coordination, and distinction of central powers, how are local authorities and local medical officers, in all the far-reaching and various departments of national function now being intrusted to them, to derive their instructions and judgment, to command attention, to be supported in their legitimate functions, to be furnished with knowledge, and to be inspired with earnestness and devotion to duty ?

CLINICAL PROFESSORS.

In passing now from hospital and public medicine to the school, I would congratulate this University on the recent appointment of responsible professors of medicine. The rich services and the accomplished staffs of the London hospitals fall far short of their potential capacity because in this respect everybody's business is nobody's business. By general report, by the uneven quality of the clinical training of Cambridge students in London, and by personal comparison of the services in great continental hospitals, or, indeed, Edinburgh Infirmary as it was in the days of Begbie and Stewart when I knew it best, and as no doubt it is still to-day, I note in foundations so magnificent as the half dozen chief London hospitals that their defect of responsible clinical professors results in grave short-comings. The apprenticeship system died out and no other methodical system took its place. Admirable are the gifts, devoted are the sacrifices of individual physicians and surgeons, and by such virtues this member of the staff or that gathers for a time a fairly regular class about him ; yet he is but an unpaid or ill-paid volunteer, whose personal and private interests must be his chief consideration. None of the senior staff is invested with specific duties or responsibilities. Thus as a whole the teaching is without system, without concentration, without definite standards. At the best it is a procession of brilliant episodes ; in the mean it is casual drills under no commanding officer. Where in these great hospitals do we find, as in France and Germany, a clinical professor of experience no less ripe, of repute no less eminent, devoting the best of his golden hours to the

hospital; making and controlling his assistants, and guiding his classes in research, working out leisurely his own problems before their eyes? In our visits to great English hospitals do we not see more frequently the great physician or surgeon fitting rapidly from bed to bed, hemmed in by a crowd of foreign admirers, dropping indeed as he goes pearls of wisdom, but educating nobody? His seed thoughts we pick up thankfully, but still we want also the curious, the leisurely, responsible professional teacher, such professors as you fortunately now possess in those eminent physicians Dr. Graham Steell and Dr. George R. Murray.

MEDICAL STUDIES.

Although in my little book on "Professional Education" I have dwelt at some length on medical studies, yet the present occasion and the recent discussion at Sheffield seem to call for some reiteration of opinions for which hitherto I have obtained more attention outside our profession than within it. I hope it is a pardonable conceit on my part to surmise that, had they been noted at Sheffield, the discussion would have moved toward clearer issues and led to more definite conclusions. To-day I can but touch upon the central problem, the evasion of which at Sheffield gave an arbitrary character to what might have been a very important debate—namely, *the relation of university to technical study*. When directly challenged, all competent observers admit that education does partake of these several qualities; and that however commingled in practice however conflicting, the virtue and functions of each must be discriminated, valued, and compared. Moreover, it is generally admitted that as university education, looking as it does to the man and to the future, is apt to be thrust aside for technical equipment which is for immediate gain, the cause of individual development and future knowledge should be the more jealously guarded. Forgive me if under limits of time I put the matter bluntly. A father says, "I can spare neither the time nor the money to give my son a university education, in the proper sense; indeed, I am not sure that I desire it; I do desire to make a special workman of him, and as soon as possible; all beyond this may bring in no more than its own reward. Yet, as many universities have been granting medical degrees on diploma standards, and for training no more than technical, these degrees have become an indispensable business asset; consequently my son must have the stamp, not as a mark of a liberal education, about which I am not now concerning myself, but to testify to good average technical attainments. Specifically I mean that every candidate, competently instructed in the art and mystery of medicine, must be furnished with an M.D. degree." This is the idea now prevailing in our profession and the claim is a serious one; perhaps, in the tangle of these matters, irresistible. At any rate, as things are, it has my sincere sympathy.

There is, however, no inconsiderable part of our profession which goes not quite so far. This partly, while still regarding the curriculum as narrowly from the technical point of view, would, however, hold back the university degree for a minority of candidates who have distended their minds with a bigger content; though still of technical staff. With this party I have less sympathy, little or none. If for mere technical instruction the world compels us to give the seal of a university—that seal which ought to attest a disinterested education, aiming chiefly at the making of the man himself—well, we have the recognised excuse of duress. For in the past technical medicine has edged its way into the machinery of the universities as no other technical instruction has done. Save in this anomalous case of medicine, universities have never regarded themselves as engines for the manufacture of professional men as such. The person is made in the seminary and the parish, the lawyer

in chambers and court, the soldier in the field, the engineer in the workshop, and so on. To none of these does the university give the seal of practical competency; it testifies to the individual development only. By this anomaly in medicine our conception of a liberal education has been so warped or at any rate so confused, that university degrees on diploma standards may be inevitable. But, I repeat, I can feel no sympathy with the party which, by withholding the degree until as much of this erroneous conception as possible may be accumulated, would give our principles away more completely and force the universities to the manufacture of pedants. For the more intense the specialism the deeper and broader must be the universal foundation. The function of the university is to make the man; and if the man be but half made—I am speaking of course, of the average student, not of the genius who makes himself—the greater burden upon his back serves only to exhibit the slightness of his frame. A technical instruction cannot by mere length and toughness become a liberal education; yet herein the Sheffield discussion reminded me of the old comparison between rheumatism and gout: turn the thumbscrew till the pain is intolerable and you have rheumatism; give it another turn or two and you have gout. So with study: by turning the screw beyond the already exacting pressure of the medical schools we are to carry the technical into a university education. Wince from the truth as we may, a liberal or university education is primarily of different scope, and means a different method and course, not at the end of the curriculum but from the beginning; the professional school however exacting educates the average physician not otherwise than the clerical seminary educates the average clergyman.

But, it may be urged, if we can entrust a university with our technical training, and can set a hospital in the middle of it, shall we not get the best of both worlds? Will not universal methods and scholarly standards mould the technical methods on lines which, if not so as generous as could be wished, may yet be fairly ample? Can we not by levelling down university standards and forcing up technical machinery attain a certain efficacious mean? Now it is a little irksome to me to contest this proposition, for in former addresses, before audiences too much wedded to abstract academic methods and prone to edge away from concrete processes, processes which, no laboratory ingenuity can imitate or even conceive, I have urged that, Antaeus-like, knowledge must continually be recharged by earth contacts. Universities are no longer to be the cloisters of subtle and fastidious persons, observing the wind, and all a little afraid of each other. Albeit this return to the realities of life is not to be for the accommodation of mean positions but for the achievement of still wider knowledge. The mean position, as social history tells us and as biologists are illustrating, is a position not of advance, not of growth, but of retrogression. As Professor E. H. Starling said, we cannot get a quart into a pint pot; but by these measures I would figure, not the potential capacity of the student, but the stricter capacities of our respective methods. Not by any shift can a pint method be dilated into a quart method; the pot may be filled to the pint peg only, if no more can be afforded, but if it is to hold a quart it must be designed on the lines of the quart from the commencement.

There is no escape then from the unpalatable truth that if a liberal education, the education of a university, the making of the man, is to preside over the making of the particular professional man he must pay the price. Be the technical call for time such as it may—five years, say, or six—if the original capacity of the individual is to be brought out, if his personality is to be developed before, and also hand in hand with, his adaptation as a special instrument, some enlargement of time

and opportunity has to be given and paid for. Narrow circumstances may deny it to him, they deny us many excellent things; but in this case the average man will never fully find himself, he will be designed as a receptacle and a retailer, and on the lines not of a progressive but of a stationary practitioner.

CONCERT OF METHODS.

Happily, however, with some mutual adjustments, the creative and the instrumental methods may be combined and the double price in time and money reduced. If the function of a university is to be the maker of the man as a whole, it cannot properly be made responsible for his technical efficiency as a practising lawyer, a practising person, a practising physician; as a soldier or an engineer in the field. Nevertheless, theology, law, medicine, military history, engineering, and the like are taught in universities, and herein it is that university ideas and the hard-pressed student and his guardian may approach each other. For to develop the individual faculties, and to create the man, almost any subjects can be used if they are used thus as universals; not as particular equipments, not as furniture, but as disinterested means of unfolding the secret powers of the mind. Yet it is at this very crux that Professor Starling would desert us. If I read him aright he would, while in the university, curtail these convenient studies from educational to instrumental purposes, thus neutralising the very principles on which an accommodation between liberal and technical ideals is practicable. For instance of anatomy, the university, on his suggestion, is no longer to teach anatomy as a means of culture—a disinterested anatomy, to awaken and develop the general faculty of exact observation, and to imbue the mind with broad morphological and genetic principles, but, instead of this disinterested study, sections useful to the future craftsman are to be extracted; neglecting the development of faculty we are to confine ourselves to the inculcation of immediately useful parcels. This is indeed to shape the instrument before we have forged the steel. I have never forgotten the day when Humphry put a bone into my hand and revealed to me as an undeveloped youth what scientific observation meant; it meant not just points for the surgeon, for surgery then formed little or no part of the Cambridge curriculum, but a training of faculty, whether for the physician, the naturalist, the physicist, the palæographer; in a word, for universal education. Thus one realises how carelessly the untrained eye skips its reading; had I been told to note only what I might happen for some practical purpose to want, and to skip the rest, the eye would have fluttered unchastised over many a tiny point, which afterwards, when the mind had been raised to the conception of principles, would have revealed itself as an "expression point," significant of cycles or deviations of growth which otherwise had left no trace. "To look with the eye confounds the wisdom of ages." Moreover, in the unforeseen future, as, for instance in the field of modern neurology, it is the anatomical habit of mind, apart from the memory of details, which in great part gives his lead to the successful observer in new spheres of observation. Such in anatomy is a part of the contrast between universal and technical methods, but such also are the potentialities which enable us to use almost any department of knowledge for an education of universal quality.

Secondly, if time be gained thus, we shall find other gains also at a later stage. The maturer and more various the qualities the mind brings to bear, the more quickly and truly will it judge of what is to come before it later. The teacher's ideas have not to dwindle into the dimensions of a rudimentary disciple. The technical instruction, which it is his turn to give, falls upon a mind already familiar with standards, with

principles, with relative values ; a mind accustomed to observation, comparison, and foresight. Moreover, among themselves, such educated students do not, as those who are only of the workshop, operate upon each other at low levels, but they stimulate each other with spontaneous inquiry and critical judgment. In this search after truth their minds have found themselves, and this search is the path of life : they have that awakened sense of our ignorance which forbids us any satisfaction in phrases and conventions ; which tells us that none of our axioms is true, though truer than an indolent or gregarious assent, and guards us against the domination of the many positive persons who do not know but only assert ; such as the historian of whom Acton said that "a little study of the subject would probably diminish the severity of his judgment and add materially to its weight." For students thus educated technical attainment is greatly accelerated.

Thirdly, we may gain time for an enlarged curriculum by requiring more of the secondary schools, and by encouraging our students to come up a little younger. At Cambridge we have decided to offer the First M.B. examination to candidates on entrance, so that with us they may proceed at once to more advanced subjects. In the Sheffield discussion Dr. Dawson Turner was jealous lest thus the literary side should be starved ; I find but little of a literary side to starve, but in any case may we not have an equal jealousy of the literary schoolboy starved of science ! The elements of science required for our First M.B. are of the kind which should enter into the formation of every educated man.

Much, then, may be done, by preparation by consideration, and by adaptation, to fit together university and technical education ; but no consolidation, no contrivance, can make them identical or equivalent. Whatsoever may be the time prescribed by the Medical Council for qualification the student who desires to build up his faculties by a more universal training must add a year or two to the technical minimum, and this from the beginning of his course. It cannot be tacked on at the end of it.

Is it not, then deeply to be regretted that a great Lancashire merchant, a man of energy and powerful in material progress, should use his influence to declare that "a university education retards a young man's progress in commercial life, by occupying years in the study of classical and other subjects when commercial training would be more valuable." Now he must be a very dull or a very complacent observer who supposes our modern industrial civilisation to be hitherto a great success ; still what an abasement, surely an unmerited abasement, to suggest of commerce, for which ancient calling this and other universities are now giving new opportunities, that it is all trivial ; that it is incapable of principles, of high standards, and has no uses for an education which stores the mind with liberal knowledge and opens it to new and various ideas. We have seen that a disinterested building up of mental faculty is not a matter of this study against that, whether of literature, of social and commercial economy, of physical science, of history and so forth, but of the larger manner of its handling ; that university training does not consist in decorative accomplishment, nor in disdain of common things, but in an openness and a flexibility of mind to new issues, in the spirit brought to the study of everything ; for although in nature nothing is common, nothing is smaller than another, to the small mind everything is insignificant. Herein the American surpasses the English plutocrat ; he sees beyond the counter, he has faith in the best knowledge in every field ; we have not this salvation. Let me contrast with such complacency the words of an even more considerable teacher : "You are

citizens of the great and mighty city of Athens (a city by the way mightier than any of ours); are you not ashamed of heaping up the greatest amount of money and honour and reputation, and caring so little about wisdom and truth, and the greatest improvement of the soul which you never regard or heed at all?" German commerce is teaching us the bitter lesson that even in his own material field your "practical man" over-reaches himself; that his "good workman" is unable to investigate even practical problems, to appreciate the discoveries of others, or to teach his apprentices. If he is to transform human energies into the best material results the practical man must have the best kinds of minds at his service; not merely the handy man, sharp and resourceful in common emergencies, but of no insight and no horizons.

PORTAL OF QUALIFICATION.

If then a university degree is to be exacted for utilitarian teaching which, as it is to occupy only the time officially prescribed for a diploma, cannot attain to university standards, we shall lose sight of the first principles of all education and barter away the foundation of medicine herself and of all progressive knowledge. It has been, however, as I have said, a part of the anomaly of university medicine that for this profession universities have been endowed, or shall I say "saddled," with the duty and responsibility of qualification for practice: a concern, which, as we have seen, is none of theirs, or is theirs only in common with society at large. By the establishment of one portal to the Register the State will, I trust, soon relieve us of this alien burden and of the duty of tests no less alien to our best purposes. At Cambridge indeed, I consider that to impose upon those of our M.B.-B.C. candidates, who are already on the Register, as are some 75 per cent. of them, a repetition of these diploma tests, is not only otiose but grave evil; it prolongs what Professor Starling well calls the "stuffing" period, the period during which the candidate denies himself the wards that he may sit in his lodgings with a teapot, and a wet towel about his brow, fagging up handbooks. The contents of these, in dilute solutions or on sheets divided into opposite columns of neatly docketed cram, he details to us over again at Cambridge. Now many of these candidates, as later we find by their M.B. theses, we really had led to think for themselves; yet in a qualifying examination they dared not venture to betray it. Occasionally an audacious spirit may enter a timid demur to current doctrine, or phrase, and if so, from me at any rate, he obtains a good mark, whether his demur be justifiable or not. But, if I exclude the few riper students who give more time to the university, I can hardly recollect a paper in medicine in which a candidate broke away from conventional notions and sheepish assent. Man by man and year by year, their papers are as conventional and as flat as willow-pattern plates.

TESTS OF METHODS.

But it may be urged, are not these remonstrances rather fanciful, rather academic, counsels too rare for a common world! Well, we will try, as the children say, to prove our sum. We must go beyond these tests of current doctrine and common formulas, of the capacity of swallow and regurgitation by which our examination candidates regularly amaze us. We shall seek a test not of the volume but of the design of the candidate's work of the power and quality of the human organ we profess to have built; of the personal character informing his notions. We shall mark whether his argument signifies that his ideas were spun in his own loom, or are all warehouse goods; and if in the accuracy and lucidity of his language he betrays a precision and balance of thought. We shall note as highly significant such fresh observations and ideas as offer

themselves on all sides to the developed intelligence, the quickened eye, and the arm which has learned to know the quarry and handle to pick.

Whether the qualities of the university graduate are as remarkable as they should be in current medical writing it might be ungracious at present to inquire; and I must not assume the truth of the recent complaints that English Bachelors of Science, when they visit Germany are found to be trained so much on books and laboratory clerking, and so little on personal initiative, that their education has to be recommenced on better lines; I must then confine myself to one, but this a definite, test. At Cambridge, before an M.B. candidate can receive his degree, he must prove to us that, however well "stuffed" a pupil, he is able also to show that he is not a mere mouth-piece, but in some reasonable measure has developed and realised his own personality. Before he is admitted to graduation he must show us not only how much he can repeat, but hidden under the pile of his tasks and cram he must also discover himself. Plaintively as at first he may protest that he has nothing "original" about him, he has none the less to set to work on some piece of research—when to his surprise and pleasure he usually finds out that we had made a thinking and even a creative being of him after all, and on this discovery he goes into practice a different man. But this research work for the M.B. is unfortunately the boon only of Cambridge men. I have therefore to seek my test in the M.D. exercises, where, if at all, lies the test of personal construction as contrasted with borrowed furniture. The M.D. candidate is too old for examination and he should be too good for a test so coarse. Therefore, every university, perhaps all universities, began by making the M.D. dissertation the chief test of its peculiar influence, of its formative discipline, of its power of developing the mind as compared with mere schooling. Yet what are we witnessing to-day? That even this one test, the one test of the quality of the university itself, as well as of its progeny, is being quietly evaded. On inquiry I find that now of the M.D.'s of the London University scarcely more than 10 per cent. give evidence of this or any such developed and ripened faculty; and it is whispered to me that on this same path even Victoria is a backslider. Yet is not this not only to relinquish all interest in the higher qualities of our students, but also tacitly to shrink from the wholesome test whether a university has justified itself as such, or, under whatever duress, is allowing itself to be dragged down to the place of a mere technical school; This can but mean stationary pupils, and stationary pupils make stationary teachers; if a university is to become an organ of life and discovery it must begin and end by making research compulsory all round. Research must as surely be implied in the earliest stages of the teaching, as actively developed and testified in the later.

REASON, IMAGINATION, AND LIFE.

And now, in conclusion, may I turn myself for a moment to the young men entering into or crossing the threshold of medicine. You have heard me insisting upon the power of knowledge, you have heard me resenting that worst part of ignorance, the conceit of knowing what we do not know, and the inveterate habit of calling opinions "facts;" you have heard me lamenting the English fatuity of disregarding causes to throw all our energies into mopping up their consequences; and you may begin to accuse me of the creed of the Jew of Malta, "I count religion but a childish toy, and hold there is no sin but ignorance." Far indeed from me be any such counsel! I agree that a man's overbeliefs are the most interesting thing about him. I bear in mind Carlyle's judgment on one who "had a great deal of unwise intellect." I see that the lower the idea the easier it is to formulate it; so that in our satisfaction with

the solidity of our foundations we are prone to forget the superstructure for which ethical and imaginative insight must also be enlarged and illuminated. For if in logic we distinguish these endowments, if indeed in practice some may be nursed to the starvation of others, yet in the fulness of life they make each other, interpenetrate each other, and are bonded together. If then, limited by our prejudices or wearied by the quarrels of sects, we divide them in the mimic life of education, if we constrain our schools and universities to force intellect to the impoverishment of ethical and imaginative faculties, or even to nurse them in separate compartments, evil rather than good will ensue.

"My brain I'll prove the female to my soul,
My soul the father."

In the everyday world we observe, even in persons of moderate parts, that character, consisting in a high idea of duty, in an intuitive perception of the essential and a sense of relative values, a generous sympathy with various human experience, may ripen into a kind of intellectual power. And if we ask how this may be the answer is not very remote. The zone of our intensest life is not in the individual alone, nor again in the universe alone, but in the weaving edge between them. The tissue, as on the personal side it is wrought, we have to guard from decay; but the weavers' vision and hand, by an intuitive gift of insight and touch beyond common reckoning, are swiftly conceiving the pattern and designing the web. As Professor James says, "ideal impulses possess us in a most unaccountable way, and work gets done." Thus after his fashion every man of action, even the man of science, is an artist; it is by imaginative vision that he gives birth to the new ideas, which he then compares and approves by intellectual judgment. We know in part and we prophesy in part. This zone or phantom verge of intensest vital activity, this halo of creative life between the individual and his *milieu*, in ethics is faith and hope; in work is purpose and enthusiasm; in art is creation; in science is that spirit of research which is confined to no laboratory but sees in every patient a new problem for interpretation and succour.

Your beliefs then are integral constituents of your lives, and are your driving power. For with duty or values, or even with ends, the equal eye of science has no concern. And if any one of you thinks he has no belief he lies in grievous error. Consciously or not, each one of you is harbouring his own ideal of life, good or bad, and is living by it; if the moth gets into it your character will decay with it, and so will your influence on others. Mark then, day by day, the order of your springs of action, that your hearts may be lifted up, and the continuity between will and action quickened and knit together. We have seen that to progress we must be living above the mean position; and as modern philosophy postulates that our several worlds are not outside us but within us, and are what we are, we realise that the world is what we make it; and that our maturer responsibilities cannot be ordered by any external authority. In the words of an accomplished author, Miss Mary Cholmondeley (I forget in which of her interesting stories): "How many rush hither and thither, and wear down the patience of earnest counsellors, and all the best years of their own lives in fretting and scratching among ruins for by law by which they may live! They look for it in books, in the minds of friends, in the face of Nature who betrays in her eyes the knowledge of the secret but utters it not. And last of all a remnant of the many look into their own hearts, where the great law of life has been hidden from the beginning."

For the pattern and governance of your daily lives I am thankful to say that in our own profession you will find a true and helpful example.

Conversant during a long life with the homes of medical men I have felt rebuked again and again by their devotion to duty, their peerless generosity, their self-respect, and simplicity of manners. Faultless we are not, as more than once I have dared to say. Besides the temptations common to all men we have temptations peculiar to ourselves. Our patients, loyal and grateful as most of them are, disappoint us at times, and these disappointments may be very galling. In these days of rather aimless unrest they are too apt to forget the importance of continuity of observation and treatment. The consultant gives counsel indeed, but upon the family physician, who knows the whole story and sees the daily strains, depend the patience, the vigilance, and the discrimination needed to compass the cure. Yet too often, and perhaps by a tea-table cabal at a critical time, the patient is whisked off to some "specialist" who has an Installation, an Institution, a Home, or a Spa, which has to be kept agoing—*recte si possit!* And to the patient life is very dear; his judgment is enfeebled by illness and care; he clutches at any fair promise of aid; and the physician must remember that he also is human and that when ill himself he is apt to run hither and thither quite as inconstantly.

And are we not more to blame when our imaginations, kindly for others, stop a little short of our own brethren; when we are not quick to put ourselves in the place of him whom we are unhappily wont to designate not by the word of brother, but of "opponent"? Now words sink into our minds like stones. The relations of medical men in small societies are delicate, and with the best intentions misunderstandings are apt to arise, and to be aggravated by busybodies. If, indeed, our medical neighbour be not very fraternal, not always perhaps very high-minded, we must remember that herein lies one of our special temptations; and, if only for our own happiness and peace of mind, we must be a little blind to his faults and endeavour by our conduct to bring out not the worse but the better part of him. There is more awkwardness in these matters than malevolence, and there is nothing high-minded in being quick to take offence.

You may be tempted to say that it is all very well for me at my time of life thus to pose as your philosopher, and to set before you intellectual and moral ideals which you cannot hope in this rough and tumble world to attain. But to hitch our wagons to a star is not to reckon on camping in it at nightfall. An ancient sage has told us: "In magnis et voluisse sat est"; a modern poet puts it; "It is not what I was but what I aspired to be which comforts me"; or, as we say in our strong northern vernacular: "He did his best, and he couldn't do nowt else."—The *Lancet*, October 10, 1908.

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