

## Our Medicine-Men

By ONE OF THEM

*I—Are Commercialism and Science Ruining Medicine?*

*Drawings by CLARENCE DAY, JR.*



ONE of the most distressing tendencies in American medicine is the decline of the old-fashioned general practitioner, and his replacement by the modern so-called scientific physician and group doctor. The doctor is rapidly losing his important rôle of comforter and friend; he is no longer considered to be privy to the secrets of black magic or to derive his healing powers from intimate acquaintance with gnomes, sprites, devils, or deities. He is venerated, instead, because of the growing belief that he is one of the chosen disciples of the new god of science. In the Middle Ages the brothers of the Rosy Cross befuddled their clients by their supposed possession of the philosopher's stone. At present the healer awes his patients by coming to them reeking of the laboratory, or by allowing them to see, as if by accident, his scientific proceedings with calorimeters, syringes, and guinea-pigs.

This is sad not because it will have a very perceptible harmful effect upon the average length of life or upon the general health of our countrymen. Indeed, it is possible that the services of the new physician may be in some ways more important than those of his predecessor; but there is cause to lament the passing of "old doc," because his going means the disappearance of a charming character, a wise counselor, a comforter in time of distress, a rock to cling to in the storms of disease and in the presence of death. His twilight must fill one with melancholy, because he was usually a figure of simplicity and sincerity and real dignity in our communities, which are already more than filled with hypocrisy, charlatanism, loud advertisement, meretricious efficiency, pretense, and vulgarity of all kinds.

The adorable figure of the doctor of the old type has been beautifully described by pens that put this one to

shame. Oliver Wendell Holmes has painted the physician of the middle of the nineteenth century, Dreiser has characterized him admirably in his book, "Twelve Men." To the present writer one of his type will remain an impressive and altogether unforgettable figure, who helped him through the annoying maladies of childhood and advised him with priceless wisdom during the tortures of adolescence.

T. G. H. received his medical education in the early eighties at the University of Michigan, and settled down immediately afterward to practise in a village in the western part of that State. Here he remained for more than thirty-five years as the principal physician and as a figure of importance, doing incalculable good among the villagers and the inhabitants of the surrounding country-side. His appearance impressed one instantly with confidence. He was stockily built and of middle height. His head and shoulders were massive, and his jaw was clean-cut and strong; he gave the impression of crag-like solidity and simplicity. His expression was ordinarily thoughtful and stern, but his gray eyes twinkled at intervals with understanding of human sins and peccadilloes, and his rare outbursts of chuckling laughter were hearty and inimitable. He was religious to the point of fanaticism, yet his long experience and keen observation of human frailties made him in many ways a tolerant and wise counselor. When the writer, troubled with the collapse of his religious faith through secret readings of Ingersoll and Darwin, came to him with his doubts, the good doctor, instead of denouncing free thought and science, replied with a history of his own struggle with the enigmas of life.

His ability in diagnosis was of the first order. It showed that combination of careful observation, long experience, and rare good sense that led one to consider his judgments to be intuitive rather than based on memory of principles rammed into him in his college courses. He made little use of modern diagnostic paraphernalia. He was not acquainted with the technic of blood counts, Wassermann reactions, or determination of blood urea. He did not poo-h-poo at them as new-fangled, but seemed impressed with their importance. Yet one felt that he was able by short cuts to arrive at fully as sound conclusions as those gained by the aid of these elaborate and expensive tests. His apparatus of diagnosis consisted of a thermometer, a stethoscope, a few test-tubes, and reagents for simple urinalysis. These alone aided his clear mind and intuitive judgment in arriving at diagnoses of astounding accuracy.

At the same time he was never afraid to admit that he was baffled in the study of some obscure malady. This characteristic, so much a part of his fundamental frankness and honesty, added to the confidence that every one had in him. He was like old Skoda in his refreshing therapeutic nihilism. He was no peddler of yarbs and simples, but was, on the other hand, a firm believer in the power of nature to cope successfully with many diseases. He constantly reminded his patients of this fact, and disdained to take the credit for cures that the universal mother herself had effected. So it may be imagined that he scorned the great majority of his quacksalving colleagues, who administered innocuous concoctions, and then took the credit if their patients recovered.

T. G. H. is dead, taken away too soon from a community that loved him, and in the end killed him by its incessant demands upon his strength. General physicians of his extraordinary ability become more and more rare. Communities of the type that he served have now to be content with the mediocrities or sixth-rate graduates of modern medical colleges. The more promising students are lured from attempting the difficult, but useful, life that was his. They cannot resist the temptation of the rewards of money and notoriety that attend the successful metropolitan specialist or consultant of to-day.

The absorption of the best talent by specialties, consulting practices, and, finally, by that coalition of specialists known as the "group" is a phenomenon to be ascribed largely to the rise of modern surgery. Its augmentation of magnificence and importance is one of the most romantic occurrences in modern affairs. For, from his ancient association with barbers, the surgeon has climbed to an eminence of the

utmost dizziness. He is the most prosperous of physicians. The general practitioner, who once scorned the knife as a weapon fit only for such humble persons as tonsorialists, is now at the beck and call of his former servants.

In the sixteenth century surgeons in general were said by Clowes to be "shameless in countenance, lewd in disposition, brutish in judgment and understanding." They were recruited, according to the same author, from "tinkers, tooth-drawers, peddlers, ostlers, carters, porters, horse-gelders, and horse-leeches, idiots, apple-squires, broom-men, bawds, witches, conjurers, sooth-sayers, and sow-gelders, rogues, rat-catchers, runagates, and proctors of spittle-houses." And strange were the remedies sold alike to kitchen-maids and fine ladies by the very flotsam and jetsam of humanity.

Indeed, for many centuries it took a considerable amount of courage to practise as a surgeon, and the endless dismal succession of quacks and rascals is lightened only by the occasional



Privy to the secrets of black magic

appearance of men of talent and honesty, like Paré and Hunter. But with the discovery of anæsthesia in America, and, what is more important, the application of Pasteur's researches by Lister, a great change began to take place. Lister proved that the application of the principles elucidated by Pasteur permitted of the exploration of the deepest recesses of the body with comparative safety. The chances of death by microbes introduced by the surgeon's manipulations became remarkably fewer. This resulted in a great decrease in the appalling amount of homicide perpetrated for ages by surgeons of all ranks. Diseases such as appendicitis, inflammation of the gall-bladder, various tumors, etc., can be dramatically cured by surgical intervention.

The craft of the repair of the body developed with surprising rapidity, and it is natural that Americans, famed always for their technical ingenuity, should play a prominent part in the amazing growth of this now dignified occupation. Murphy, the Mayo brothers, Halsted, Finney, Nancrede, and Cushing are only a few of our countrymen who have played a prominent part in the development of surgical technic. These men, whether specialists or not, were in the first instance general surgeons of great ability. What is more, they combined a wide general knowledge of pathology and diagnosis with their mechanical and manual skill.

The technic and methods of surgery are to-day things to admire and to wonder at. In the hands of honest persons the craft is certainly one of humanity's most laudable boons. It is only the prostitution of this honorable and useful craft by an increasing

horde of commercialists and unprincipled pirates that is to be deplored.

The success of the distinguished surgeons just mentioned stirred hordes of men of mediocre talent to attempt their emulation. Unable to master the wide field of knowledge covered ably by these protagonists, the imitators began to specialize in the absurd manner of the physician-priests of the dynasties of the Pharaohs, who confined themselves to the treatment and butchery of strictly isolated organs, or even went so far as to concentrate their supposedly beneficial manglings upon a single disease. What is still more foolish, the rank and file of the would-be wielders of the knife begin their specialization not after a comprehensive experience, but immediately following the admittedly insufficient four years in medical college and two or three years of hospital service. Their ignorance makes it impossible for them to take into account the intimate physiological relations existing between different parts of the body. They seem to be aware only of the appendix or the gall-bladder or the tonsils or the internal ear or the turbinated bones of the nose.

Each looks upon the organ for the slashing of which he has developed a *penchant* as his legitimate prey. It is a secondary consideration whether the part is healthy or plagued by a malaise. These specialists are inspired with a mania for indiscriminate incision. Some of them seem to believe that the general extirpation of certain appendages would result in an unheard of salubrity for the human race. The useful services of superior men of the type of the Mayos naturally brought a commensurate financial reward. And it is this increase in the emolument of

deserving surgeons that has led to the unrestrained absurdities and excesses of imbecility that are perpetrated by the rank and file of the wielders of the knife.

"Why slave as a general practitioner," argues the medical student, "when I can become rich and notorious by a wholesale removal of tonsils?" This opportunity for venality has inspired the most daring and unheard of excesses

of commercial brigandage, practised with the dignity and unction and respectability that allow it to flourish with hardly a word of protest. Operations are advised on the flimsiest evidence of their necessity. Frequently they are performed on healthy persons.

The absurdities of specialization are becoming so palpable that surgeons begin to look about for some modification of their present status. They reason that if medicine has become so complicated and of so wide a range that an ordinary person can master only a small part of it, the logical procedure would be the formation of an association of men with different *penchants*, who might cooperate in the removal of the organs and in the resulting occasional relief of our suffering citizens. They begin to realize, also, that the time required to perfect the technic of the operations leaves none for the study of the art of diagnosis. They rightly argue that it would be a step forward to perform their excisions upon persons the exact nature

of whose illness had been determined. This would be greatly preferable to the widely existing present practice of operating upon persons whose maladies had been cheerfully guessed at either by the surgeon or by some satellite

practitioner with a shrewd eye toward the splitting of the surgeon's fee.

As a result of these sage cogitations, groups of specialists begin to spring up in the land. This group is essentially a business



Strange remedies sold to kitchen-maids

partnership of specialist surgeons who associate themselves with an internist, or diagnostician. The last determines the nature of the disease, and distributes the patients, let us hope with impartiality, to the various operators. The diagnostician surrounds himself, in turn, with a body of henchmen known collectively as "laboratory men." In large groups there may be several of these satellites, who are regarded a bit sniffishly by their chief, the internist, and who are beneath condescension by the surgeons.

The procedure, then, is roughly as follows. The patient appears before the internist, to whom he may have been referred as a last resort by some practising physician. The sufferer is examined thoroughly by the diagnostician, who causes an array of chemical, pathological, bacteriological, and radiographic procedures to be carried out by his corps of laboratory workers. These tests are important—and very expensive to the patient. The resulting data are now correlated, if possible,

with the findings of the physical diagnosis, and out of this mélange of facts, which are sometimes obscure and even contradictory, comes some kind of determination of the client's malady. The sufferer is then referred to the appropriate surgeon of the group, who proceeds at once to the operation. Fortunately for the business affairs of the group, it is frequently necessary to perform a series of operations upon patients whom the various scientific tests show to suffer from a complication of diseases.

The effect upon the purse of a person finding it necessary to seek the ministrations of the group is devastating in the extreme. All of the various laboratory tests, the physical examination, the anæsthetic, the nurse, the operation, are carefully charged for on the itemized bill. Frequently he emerges from the frying-pan of his illness, his life doubtless saved by the laudable coöperative efforts of this group of scientists, only to step into the fire of a load of debt which is almost insupportable.

The quarters occupied by these associations of experts are the very antithesis of the untidy, dusty, modest sanctum of the old-fashion-

ed "doc" of other days, so charmingly sketched by Opie Read:

"In this professional hut there was only one window, the glass of which was dim with dust blown from the road. The furnishings of the office were less than modest. In one corner

a swayed bed threatened to fall, in another a washstand stood epileptic on three legs. Nailed against the wall was a protruding cabinet, giving off sick-room memories. The village druggist, compounder of essences of strange and peculiar 'yarbs,' might have bitter and pungent medicines, but old doc, himself an extractor of wild juices, had discovered the retching secret of the swamp. To go into his office and come forth with no sign of heaving was a confession of the loss of smell. Sheep-shearing fills the nostrils with a woolly dullness, but sheep-shearers could scent old doc as he drove along the road."

Not so the offices of the modern group of specialists. Their suites of rooms are situated in magnificent office buildings. Frequently edifices of many stories are devoted to the housing of collections of stylish doctors. The central waiting-room bears little suggestion of medical affairs. It is fitted faultlessly in expensive and luxurious

antique furniture. It has that "subdued air of elegance and refinement" much sought after by those of our commercially successful countrymen who wish to shed their pristine vulgarities. Its walls are

hung with portraits of famous physicians. Upon a central library-table repose neatly arranged copies of the better and more sober type of American periodicals, and there is a noticeable lack of the more vulgar type of journals that diverts the moments of



And sold to fine ladies

waiting in even the best barber-shops. Around the walls are arrayed book-cases, garnished with fat medical tomes and with endless ranks of bound volumes of medical periodicals.

The place is presided over by a businesslike, yet discreetly sympathetic, being, usually in a uniform suggesting that of a nurse, who combines the function of reception committee with that of telephone operator and maker of appointments. The remainder of the suite, which includes consultation- and examining-rooms, minor operating-room, laboratories, ateliers for radiography and photography, has the same air of scientific austerity, of efficiency, elegance, cleanliness, and expensiveness.

It will be clear that the maintenance of an institution of this type is to be supported only at a formidable cost. The salaries of the staff and of such coadjutors as dentists, laboratory men, radiographers, nurses, technicians, bottle-washers, librarians, office girls, telephone operators, and charwomen add to the immense amount necessary for rent and equipment.

From this it naturally follows that the charges to the patient must be correspondingly enormous. The business organization of the group is usually conducted with a truly American efficiency, and with an impersonality and heartlessness necessary to all sound economic enterprises. For it is this, in fact, that medicine is rapidly becoming. The high fees obtainable by the expert doctor have made medicine what it has seldom been in the past—a paying business. This materialistic element is essentially foreign to the spirit of the true physician. Like the functions of the educator and the priest, that of the good doctor has

been one of self-abnegation, of devotion to ideals. These ideals, which are necessary to a calling which should be altruistic and partly religious in its nature, have been rudely upset by the entry of economic enterprise.

It may be imagined that the services of these expert super-doctors are, for all the free work done for the poor, accessible in the main only to persons well endowed with worldly goods. The rank and file of us must be content with the ministrations of the more humble practising physician, who becomes less and less the idealist of the old days, and who represents now the mediocrity whose lack of ability or personality makes impossible his attainment to the dignity of the specialist. In addition to the rich, the services of the super-doctor are available occasionally to the very poor. These he attends as a teacher in a hospital clinic. For the title of "clinical professor" is an important adjunct to prestige, and, by the same token, a business asset.

The affluence of the specialist has of necessity reacted badly upon the general practitioner, who finds his more wealthy patients deserting him for the medical experts. Hence, deprived of his most important source of income, he is forced to be less charitable to his less fortunate clients. So it is natural that the ancient and praiseworthy spirit of altruism and economic negligence tends to disappear from the profession of medicine.

The inaccessibility of expert medical attention to the middle classes has led to the demand for the complete removal of the motive of gain from medicine by its socialization. The writer recalls an eloquent plea for this step, made by a brilliant and disin-

terested professor on the opening day of the school year in an important medical college. The reception of his cogent arguments by both students and faculty was anything but cordial. The majority of the undergraduates had apparently never given the matter any consideration whatever. The clinical professors, most of them luxuriating in outside incomes of an agreeable corpulence, were manifestly unimpressed by the forceful appeal. It is highly unlikely that any important step toward the socialization of medicine will be made in America for some time to come. Should certain foolishly visionary and idealistic persons attempt it, the bitter opposition of the majority of physicians, and especially the super-doctors, may be safely predicted.

The question remains whether this new alinement of the medical profession results in an improvement of service commensurate with its increased emolument. Certainly the refinements in diagnosis, the blood counts, pathological tests, metabolic studies, bacteriological examinations, and X-ray plates afford facilities unknown to the physician of the *ancien régime*. On the other hand, the very presence of all these aids leads the modern physician more and more to neglect the careful and essentially simple methods of observation and physical examination notably developed by Laennec and Skoda, by Widal and Osler. The more heavily the physician leans upon the science of the study of disease, the more he is likely to neglect facts that might be directly and simply determined without an imposing and confusing array of modern gimcracks. The famous surgeon, Nancrede, expressed these thoughts when he exclaimed in an out-

burst of choler, "it is commercialism and science that are ruining medicine."

I have tried to sketch the blight commercialism has laid upon the profession. It remains to suggest the danger that lies in the assumption by the average doctor that he is prosecuting the scientific study of disease.

It is possible to study disease scientifically, but it is absurd to pretend that this can be done by the rank and file of doctors, who carry the dim torch of knowledge handed down to them by those predecessors who persecuted Vesalius and Servetus, laughed at Harvey, ignored Leeuwenhoek, and sneered at Jenner and Pasteur. Yet the confusion of the art of healing, which is the true function of the physician, with the science of the study of disease, which is the duty of the biologist, physicist, and chemist, is a wide-spread and, I believe, disastrous tendency. The physician should be venerated not for supernatural knowledge or scientific acumen, but for his understanding of our ills and troubles, for raising his patient's morale, and, last, for applying, as a technologist, the therapeutic discoveries furnished him by the small group of scientists who actually study disease.

The medical man, if he remains in the practice of his profession, must by temperament and because of the demands of his work lack the very qualities that are necessary to the investigator. It is well known that the scientific worker must be cool, disinterested, and impartial in making his experiments and recording his results. It is well for him to show imagination and fire at the birth of his ideas. But during the experiment he must weigh accurately and measure exactly; he must be completely impartial in



recording the preponderance of one or the other of the factors revealed by his results. He must not hurrah for one or hate the other.

The function of the medical practitioner is to cure disease. His relation to his patient should be that of a comrade coming to the aid of a stricken friend. He must desire the successful recovery of his client. He must hate the microbe that malignantly harasses the sufferer. This state of enthusiasm for the patient and enmity toward the disease is clearly a highly emotional one. It has been remarked that such emotions are out of place in science, no matter how valuable they may be in other walks of life. Hence it is futile to bring the business of the physician into the scientific domain. When the practitioner of medicine ceases to be the optimistic and helpful friend of his patient and becomes the cold man of science, he loses a large part of his value.

Discoursing on medical education, a distinguished physician remarks that while disease must be *studied* in the modern university hospital, at the same time *nothing should be left undone to cure the patient*. This statement contains a contradiction which reduces it to absurdity. For in order to study the various phases of a disease with the requisite thoroughness, it is frequently necessary to abstain from any interference with its course.

It will be clear that when our friend demands that nothing be left undone to cure the patient, he asks, in effect, that the first principle of a valid experiment be abrogated. Some of the patients will of necessity have to remain without treatment if it is desired to conduct a sound investigation. This will be evident from the following

example. The first principle of a sound experiment concerned, let us say, with a test of the efficacy of X-rays in the treatment of cancer would be the selection of a large number of patients having the disease in a certain stage. All of these persons would then be placed under identical conditions in regard to diet, nursing, and general care. Then a *part* of the sufferers would be subjected to accurately measured doses of Roentgen rays, while an equal number would receive no treatment at all save the general care just mentioned. Now, if the X-rayed group showed a large proportion of cures or ameliorations, while the majority of other subjects became worse or died, it might reasonably be concluded that the rays had a beneficial effect. The untreated cases, called controls, would then have sacrificed themselves to the progress of science. But if this were done, it would constitute a neglect of the demand of our good doctor that nothing be left undone to cure the patient.

Granted that such an experiment could be made on a large number of cases covering a long period of time, it is doubtful whether it would be feasible to make the attempt. In the present stage of civilization it would certainly not be advisable. Imagine the clamor and uproar that would ensue among the family and friends of the controls, that is to say, the untreated patients, should such an experiment be made public! Humanity in general is certainly not ready for a martyrdom to the progress of knowledge. It is not ready to take the place of the laboratory guinea-pig. It is doubtful, indeed, whether the general-ity will ever become the prey of such a disemboweled itch for knowledge.



The modern group of specialists

Fortunately for us, the greater part of practitioners, in addition to being mentally unequipped for the logical conduct of such an experiment, are not of the judicial, unemotional nature necessary to its faithful prosecution.

Modern biochemical investigations have greatly increased our knowledge of those physico-chemical derangements of the body which constitute disease. When used with judgment and discrimination, and combined with accurate physical examination, these chemical methods have materially advanced the art of diagnosis. On the other hand, they are widely and idiotically misapplied by a large number of practising physicians, who have virtually no chemical knowledge or training or anything like a broad and accurate acquaintance with chemical physiology and pathology.

Yet, convinced that medicine is now a science, and eager to be regarded as savants, they do not hesitate to perform these reactions, which usually involve delicate technical manipula-

tions. Those practitioners, who are so hopelessly inept as to be incapable of handling even a test-tube without dropping it, become scientists vicariously by having the reactions performed by commercial institutions known euphemistically as "clinical laboratories." It is here that the real evil of the pretension of doctors to science is most strikingly manifest. They neglect more and more the careful physical examination, the many maxims of medical folk-lore, the apparently intuitive knowledge that experience brings. All of these have enabled the doctors of other days to perform astounding feats of diagnosis.

It follows naturally from these considerations that the place for the study of disease is in the laboratory. Here the subjects of the study are animals in which the manifestations of the malady are as nearly as possible similar to those in the human body. Such investigations, to which it is now realized that physics and chemistry are absolutely essential, begin to bring the

study of disease into the category of the fundamental sciences. It is clear that if humanity wishes to be rid of its ills, it should place every facility in the way of laboratories, apparatus, and experimental animals at the disposal of able and honest investigators. Rich men who set up laboratories out of altruistic or other motives deserve to be pardoned by their less fortunate and consequently envious countrymen who denounce them as commercial brigands. And if a genius should arise in the land who could make anthropoid apes as plentiful, healthy, and cheap as guinea-pigs, monuments should be raised to him, and his name should be sung in the epics of future generations. For it is natural that disease may be most advantageously studied in creatures that are closely akin, if not completely identical, to the human being.

In résumé it is unsound to consider the doctor as a scientist in his relation to the patients or to think of medicine as an independent science. The practice of medicine is something of an entirely different nature. It is to the greatest extent an art; it is part craft; it begins to smack of a technology or applied science.

Its craft is important in surgery, which depends largely upon the same dexterity necessary to goldsmiths, pianists, wood-carvers, watch-makers, carpenters, and sculptors. Its technology is important in the diagnosis and treatment of disease. Here the physician should always be on the alert to *apply* the discoveries made by

the student of disease in the laboratory. But in doing so, he should not consider himself a scientist. For, in diagnosing what ails a patient, he seeks to locate a hidden source of danger or annoyance in the body of the sufferer. To do this, it may be necessary to make use of discoveries, just as the famous detective Burns might employ a scientific discovery in hounding out a criminal who is a source of annoyance in the body politic. Yet no one would assert that Burns is a scientist. He is simply an excellent detective. The last and most important function of the physician is still his art, which consists largely in the emotional relationship he must bear toward his patient. In this all good doctors, from Hippocrates to Osler, have been proficient. This is in its nature antipathetic to the scientific attitude.

As for the study of disease, that should be left to those intellectually curious and largely heartless persons whose desire is incessantly to know, to discover, to find out the how of things. The best of them have scant interest in the ills of patients; their curiosity concerns itself with the sickness in itself. Contrary to their own occasional pretension, and to the invariable description of them in newspapers and popular gazettes, their desire is *not* primarily to relieve suffering humanity. They are driven to their task by that strange instinct that gave rise to the impudent and dangerous explorations of Henry Hudson and to the unholy and heretical probings of Galileo.

# Our Medicine-Men

By ONE OF THEM

*II—What Is Preventive Medicine Preventing?*

*Drawings by CLARENCE DAY, JR.*



THE purpose of the medical profession is said to be the cure of disease and the prevention of its occurrence. It is possible in America, as well as elsewhere, to detect a growing air of sniffliness toward the pound of cure, together with an increased regard for the ounce of prevention. This is true of progressive physicians and advanced thinkers generally. The present vogue of preventive medicine is chiefly a product of the humanism that has resulted from the advance of physical science and the decline of Christianity. Modernism tends to put aside the worship of deity and to substitute for religion a supreme arrogance, a confidence that mankind can look out very well for itself.

The same tone of defiance in the face of the terrors and the limitations besetting all living things is to be heard in the voices of hygienists and preachers of public health. It is implicit in the later researches of Metchnikof, who boldly demanded the extension of our biblically allotted threescore years and ten. It is to be discovered in the ringing appeals of public health orators of the type of V. C. Vaughan. According to perorations of this kind, the purpose of the science of the study of disease is not academic, but always utilitarian. Its aim is the conquest of maladies that

have terrified man from the beginning of time. It purposes to lengthen the insufficient span of years now accorded us. It hopes to bring about the production of a new race of healthy, efficient, happy, and upstanding men. Scientists in the study of disease are represented to be animated not by intellectual curiosity, but are supposed, rather, to be driven to their labors by a deep love for suffering mankind.

This humanitarian spirit is not confined to the bacteriologist, chemist, epidemiologist, and engineer of the health army, but is ascribed, by some dexterous twist of rhetoric, to the medical profession as a whole. It is here that the pretensions of the gild rise to the highest pitch of fatuity. For the medical profession is said by certain public-health orators to be the only one that works constantly, by its efforts in disease prevention, to remove the necessity for its own existence!

There can be no doubt that preventive medicine holds out the promise of the conquest of disease. The mortality rate from tuberculosis and typhoid, from yellow fever and Asiatic cholera, is being reduced noticeably in many countries by the enthusiastic and untiring efforts of hygienists. The mean length of life is alleged to have been materially extended. Given a little

more knowledge, a few more public health officers, a more efficient hygienic gendarmerie, a slightly more intelligent and docile citizenry, and there is no reason why any one should die from an infectious disease, or any obstacle remain in the path of a grand, unparalleled, gorgeous, and stupendous proliferation of the human race.

So intimate the shouters for public health. It will be our task in the pages that follow to inquire whether such an event is desirable, and, if so, to find out in whose hands the abolition of disease should be placed.

Is the wide-spread and unrestrained practice of preventive medicine desirable? Serious objections have been advanced that it may not be. The writer brings these forward with considerable trepidation, realizing that they will be denounced as immoral, unethical, and anti-social by all forward-looking citizens. But the objections had best be faced now rather than when the evils that they point out have become irremediable. It is best to follow the advice of Huxley, who remarked that "there is no alleviation of the sufferings of mankind except veracity of thought and action and the resolute facing of the world as it is, when the garment of make-believe by which pious hands have hidden its uglier features is stripped off."

The first objection to the continuance of the campaign of disease prevention that has been made is concerned with the question of the population of the earth. This has been increasing during the past at an astounding rate. Hygienists admit that their fight is already saving countless thousands of babies and adults who would otherwise die. Every new conquest of disease is

heralded with joy and thanksgiving. Every new advance results in gifts of further sinews for the war against disease. Additional progress may be



A new race of men

looked for in the near future, with a resulting augmented rate of increase of a population that is already too dense for comfort. The twin demons of famine and pestilence have been visualized as the eternal regulators of the amount of population on the earth's surface. These ogres, whose activities are asserted by many in the long run to be beneficent, are now sorely beset by socialism on the one hand and by preventive medicine on the other.

Humanitarians deprecate the bogey of overpopulation, and hold that collateral advances in the production of the prime necessities of life will keep pace with the rapid increase of the *genus homo*. But there is a limit to raw materials and a maximum of rate of production. It is entirely conceivable that the present augmentation of inhabitants may surpass those limits. In consequence, it is only a question of time before there will be great difficulty in supplying the necessities of all. What is more, the

inordinate and rabbit-like fecundity of humanity results in other grave evils. The first is that of war. Socialists, pacifists, and humanitarians generally would do well to turn from their denunciations of emperors, capitalists, and secret diplomacy to an examination of this question. Nations like the Central empires literally burst their bounds because of lusty, constantly growing populations. No arms congresses, no florid gestures by Mr. Harding or other great statesmen, no mere preaching of human brotherhood, can prevail against the overflowing of such excessively philoprogenitive nations. It might be objected that war automatically restrains overgrowth. This is not the case, for accurate statistical investigation shows that it does not kill enough people to counterbalance the always more densely swarming humanity. Again war, as at present practised, is very objectionable. It is an instigator of Bolshevism, which has frightened the better class of our citizens to the verge of insanity, and threatens all the organizations and institutions that we prize most highly.

Another evil of overpopulation is the alarming growth of the great municipal agglomerations. As the number of our inhabitants increases, little dispersion over the land is to be noted. On the contrary, the rural population shows a relative decrease, and the incessant human agglutination into stinking and tawdry cities goes on unrestrained. It is toward

the perpetuation of these multitudinous sweating groups that preventive medicine in the long run tends.

It has been remarked that humanitarians and socialists advocate changes in the system of distribution and increase in production to offset the grave problem of overpopulation. Hygienists of a more advanced outlook dare to suggest that the problem may be met by the deliberate limitation of offspring. This plan is officially indorsed and very prevalent in several European countries, but in America the movement still suffers disfavor.

The second objection to the indiscriminate extension of the practice of preventive medicine is based upon its tendency to bring about the survival and subsequent multiplication of the unfit. Thus the hygienist who organizes the efficient supervision of the milk supply saves the cretins, morons, and achondroplastic dwarfs, as well as the healthy and



Is preventive medicine desirable?

well favored babies of the lusty middle class. This tendency of hygiene to inhibit the normal purgative methods of nature has been the subject of accurate mathematical analysis by the biometrician Karl Pearson. Pearson concludes that the humanitarian

hygienist unwisely opposes the mechanism of the survival of the fittest by which nature has kept down a too great proliferation of undesirables. He contends that continued advance in public health may swamp us with a plague of defectives.

Just as the physical and chemical researches of men like Newton, Faraday, Helmholtz, and Van t'Hoff are inspiring events in the dark history of human bigotry and ignorance, so those of Pasteur and Claude Bernard, of Bordet and Loeb, in biology and pathology are luminous and instructive. But the first-mentioned investigations, in themselves beautiful, have led to the hideous development of modern industrialism. Those of the biologists may result in a final choking of the world by a horde of fifth-rate and undesirable persons. It becomes a commonplace of observation that humanity makes ill use of the achievements of its brilliant sons. It is not yet ready for the boons that science can confer.

But it does not follow from this that the science of the study of disease should in any way be inhibited.

Since the prosecution of science of all kinds is desirable, but the application of its discoveries at present unwise, it is necessary to concoct some plan that will insure the perpetuation of research, but suspend for a time its practical, or, to be accurate, its impractical application. Preventive medicine might, for example, be put

down by drastic laws, and the funds now expended upon it be diverted to the scientific study of disease. The results obtained, instead of being made available to society, should be kept secret, excepting from the qualified persons who are conducting the researches. Then, in case humanity should awake one fine morning to find itself with the ability to check its present irrational philoprogenitiveness, and to devise and execute a plan for the suppression of the breeding of the unfit, the bottled-up knowledge accumulated by the intensive researches of the scientific Ku Klux might be uncorked for the benefit of the emerging superman.

It is realized that, while the objections to disease prevention discussed in the preceding pages are sound, it is impossible even to suggest that their logical conclusion be put in practice. The race becomes more and more

used to comfort, to physical ease, to the alleviation of illness and amelioration of pain. It can no longer sit resignedly by, contemplating fatalistically its ravishment by fearful plagues. It loses the stoicism, the fortitude, the ignorance, the sense of powerlessness before scourges characteristic of the

ancients. Therefore we are forced to turn from the logic of the perils of preventive medicine. Humanity will not heed these perils. So, all that is left for us to do is to consider to whom the task of public health is to be intrusted, if we are to increase the



Frightened by Bolshevism

good and reduce the ill effects of preventive medicine.

The principle rôle of preventive medicine lies in the control and extermination of infectious diseases. Scientists in the study of disease have dredged up many interesting facts in regard to the characters and habits of the nefarious authors of such malaises. They begin to learn something of the way in which microbes are transferred from diseased to healthy persons. This, together with the study of the resistance of persons to infection, constitutes a branch of knowledge which forward-looking doctors are pleased to call the science of epidemiology.

American medicine may be proud of the fundamental contributions of some of its sons to the problems of the eradication of disease. This work was animated by that spirit of self-abnegation and passion for truth that led the old German hygienist Pettenkofer to test the validity of Koch's claim of the discovery of the microbe of cholera by swallowing deliberately an entire culture of the virulent organisms. This was the spirit of the American Theobald Smith in his researches in Texas fever and tuberculosis; of the army surgeons Reed, Carroll, Agramonte, and Lazear in their dramatic discovery of the mosquito transmission of yellow fever; of Reed, Vaughan, and Shakespeare in the deadly camps of Cuba during the Spanish-American War; of Gorgas in the brilliant sanitary achievement that made possible the construction of the Panama Canal; of Ricketts in his studies of Rocky

Mountain spotted fever and tabardillo; of Noguchi in the discovery of the cause of yellow fever; and finally of Park, Williams, and Krumwiede, of the New York Health Department, who work devotedly and efficiently at the task of control of infectious disease in our metropolis despite the fact that they have scanty material, are paid miserable stipends, and have to defer to the imbecile whims of grafting and ignorant New York political magnificoes.

It is true that the majority of these workers were trained as physicians, but few of them had anything to do with the actual practice of medicine. They had turned from this field to that of the laboratory, to bacteriology and the study of immunity. Public health becomes less and less an affair in which physicians should meddle. It demands, rather, a man of the temperament and clear-headedness of the engineer, who is accustomed to think mathematically and who dwells in a region where the land-slides caused by his errors descend upon his own head. What is desired is a person trained in executive tasks, privy to the compilation and interpretation of statistics, in touch with recent knowledge in sanitary engineering, in epidemiology, in bacteriology.

These requirements are unfortunately not possessed by the vast majority of medical graduates or doctors, for the practice of medicine does not challenge to intellectual rigor, characterized as it is by an ethic which forbids the denunciation of the blunders of colleagues, by the



Deliberately swallowed microbes



great value placed on "personality," by a blithe readiness to "pass the buck" and stand from under the avalanches caused by serious errors. Public health in its administration and technical prosecution is therefore an affair for engineers, bacteriologists, and mathematical statisticians. What remains for the physician in this field? To him may be intrusted the subsidiary, but still important, tasks of instructing the masses in the art of birth-control, and of diagnosis of the contagious exanthematous diseases.

The writer does not wish for a moment to imply that doctors of medicine should be *excluded* from the office of health commissioner. The possession of such a degree by a candidate should do nothing more than cause the committee of intelligent aldermen in charge of the appointment to examine his abilities with particular closeness.

Recent years have seen an enormous increase of public-health work throughout the nation. The cause is championed by eloquent orators and expounded by able rhetoricians. Cities of the progressive type begin to devote significant portions of their budgets to the salaries of health commissioners, and to vie with one another in the installation of elaborate sewage systems and the construction of efficient water-supplies.

In the early days in large cities, and up to the present in the majority of small ones, the position of health officer was politically delegated to mediocre physicians, ward-healers of the local Tammany, who needed to eke out their existence by the paltry stipend that was accorded to the occupant of this office. The activities of such officials are devoted to occa-

sional smallpox vaccinations and to inane fumigations, which are now known to be of little importance. They earn their salaries by the tacking-up of red, blue, or yellow placards on dwellings smitten with the various exanthemata that are still the necessary experience of almost every child. They make feeble efforts at the sanitation of dairies whose owners lack sufficient political influence to say "Hands off!" They assert that an epidemic is under control when in reality it has burned itself out. Nobody could possibly be more impotent to check a plague than these muddle-headed gentlemen, who resemble nothing so much as the Russian *chinovniks* of the days of the czar. They are clever in creating alarms when there is really no danger, in order that they may have the credit of throttling epidemics that fail to appear.



Inane fumigations

Their inspections of the sanitation of schools are frequently elaborate pieces of folderol. Since their positions depend upon the favor of powerful political and financial forces, they are seldom uncompromising in enforcing ukases that might interfere with the interests of their masters.

Their knowledge of micro-organisms, whose efficient foes they are supposed to be, is often confined to casual observation of photographs in text-



Dosing school-children

books. I have heard members of their class pronounce bacillus "back-sillus." If they have at their disposal a laboratory with a bacteriologist, they often tend to use it perfunctorily or ignorantly, and lack the knowledge adequately to supervise its technics and methods. Being practising physicians, they are likely to show deference to the rich and to pay scant attention to the less fortunate.

In short, the typical small city health officer, and to some extent the gentlemen who fill this office in our more pretentious agglomerations, are frequently politicians, orators, and poltroons whose salaries might better be devoted to municipal displays of fireworks or to monthly barbecues for the poor of the community. Their effect upon the incidence of infectious disease is virtually nil. Progress in replacing the retired or unsuccessful otolaryngologists, ophthalmologists, and obstetricians by sanitary engineers and real doctors of public health is retarded greatly by the inexplicable theory that the occupant of the office should possess the degree of M. D. It would seem that these formidable

letters have a cabalistic significance, which causes the microbic authors of plagues and pestilences to turn up their toes and die at a wave of the hand of the owner of these magic symbols.

The intrusting of the health of our communities to physicians of the type just described leads to serious embarrassment and needless economic losses to our citizens. But the ludicrous picture presented by such persons is surpassed by that of officials who enthusiastically apply the more or less scientific data of bacteriology to practical epidemiology. Such misapplication is remindful of the asinities engaged in by physicians who make their diagnoses exclusively by modern biochemical tests. It is easy to find such instances in the field of public health.

Let us present an example of the public embarrassment that might result from this ignorant and enthusiastic attention. A small city is stricken with an epidemic of diphtheria. The alert health officer of the town administers prophylactic doses of antitoxin to all school-children who prove to have positive Schick reactions, and to such adults as will submit to the test. By some odd chance the families of the three plumbers of the town have been smitten with the disease. The good doctor swabs the throats of the healthy members of the family, and finds by bacteriological examination of this material that all three of the plumbers harbor organisms which have the appearance of diphtheria bacilli; at least he is so informed by his bacteriologist. The health officer then declares a quarantine of these households, and places the plumbers in durance vile until such

time as the noxious organisms disappear from their throats. He makes daily cultures. Each time the results are positive. The organisms persist. Meanwhile the situation of the town becomes first trying, then embarrassing, finally desperate. Sinks are stopped up, pipes burst, and the resulting inundations cause great damage; one child is scalded to death in its cradle by a flood resulting from such an accident. Bath-rooms, deprived of the attentive care of these indispensable mechanics, fall into disuse.

The citizens become frantic. Meetings of protest are held. The release of the plumbers is demanded. But the health officer is firmly backed by the city administration and the police, and remains obdurate. He insists that these important citizens are still carriers, and thus a menace to the community. Life in the town becomes more difficult. Sanitation grows impossible. Finally, plumbers are imported at great expense from neighboring cities. They attempt, with the promptness and efficiency characteristic of the gild, to repair the accumulated damage; but it has reached staggering proportions, and small progress is made. Meanwhile the interruption of sanitation has resulted in the outbreak of dysentery, typhoid, and paratyphoid fevers. The new plumbers are among the first to succumb.

The lamentable condition of the town has now been noised abroad. Additional plumbers are sought out, but refuse to come, even when offered princely sums. Life is disorganized. Citizens flee the place by night. Pestilence stalks abroad. Finally, the notoriety of the affair necessitates the

intervention of experts who find, upon checking up the work of our zealous health officer, that the original plumbers are not carriers of authentic diphtheria bacilli! Their throats harbor diphtheria-like microbes, it is true, but test proves them to be non-toxin producers, and hence entirely harmless. Such a calamity as the one just described is entirely possible, given a health officer sufficiently enthusiastic, ignorant, and backed by an adequate power for the enforcement of his dicta.

Public health activity should, if possible, be freed from the clutches of politicians whose obscenities make our municipal government the laughing-stock of the world. The entanglement of public health with politics is one of the worst of the influences that retard it; for it is now comparatively easy to find efficient commissioners of health, since these persons begin to be graduated in droves from the new schools of hygiene of our universities. But the chief difficulty in the way of their efficient functioning is that of the idiotic change of political power so frequently occurring in the majority of American cities.

The writer has a friend who is a particularly efficient health officer in a rapidly growing Middle-Western city. He complains bitterly and with shocking profanity of the vicissitudes that beset him. At present he has rather a free hand in his activities. The majority of the city council and the mayor are in sympathy with his progressive efforts. He has been accorded a liberal budget, which he uses with breadth of vision and discretion. But he lives constantly in the fear of a return to power of the minority party, which proposes to make "economy" the slogan of its campaign. These

Machiavellians, in order to keep at least partly their promises of a reduction of municipal taxation, threaten to slash mercilessly the budget of our health officer. His plans, the result of five years of educational activity, of oratory, of battling with ignorance, of intrigue, would be irretrievably wrecked if this party should come into power. Even now, in order to hold his hard-won ground, he finds it necessary to make friends with wealthy and influential men.

It is an interesting fact, which would certainly appear inexplicable to naive persons, that the bitterest opposition to his efforts comes from the rank and file of the physicians of the city. These supposed guardians of our health look askance at his establishment of health-centers. He has manned these with an efficient corps of young physicians, dentists, and visiting nurses, who give free advice and treatment to thousands of the school-children of the city. The

doctors, however, are almost without exception on the war-path for the scalp of the commissioner.

The health commissioner in question would long ago have resigned in disgust were it not for his peculiarly warlike and stubborn temperament. In addition to the tenacity of a gila-monster, he possesses marked political sagacity. This he has gained from a realization of its absolute necessity to a successful prosecution of his work. Convinced of the value of his cause, he stops at nothing to insure the perpetuation of his efforts. He matches intrigue by counter-intrigue, and has succeeded in rolling logs of a greater weight than those of his opponents. He fights fire with fire.

There are, it is sad to relate, lamentably few men of his kind who, combining good training and exact knowledge with the warrior temperament and the uncompromising devotion of a religious zealot, still possess a sufficient modicum of Jesuitical craft.

# Our Medicine-Men

By ONE OF THEM

## *IV—The Science of the Study of Disease*



ONE of the most praiseworthy of modern American traits is that aptitude for coöperation which has resulted in an organizing genius surpassed only by Germans. This spirit has to a large extent conquered the individualistic and rapacious tendencies in American industry.

The beauties of organization have so far impressed the leaders of all our activities that attempts are now being made to extend this method to the creations of philosophers, astronomers, artists, musicians, and scientists. The products of all these workers have until the present been considered the result of extreme individualism; but of late there has been a tendency to introduce efficiency, a necessity to industry, into science, which until now has been a field for intellectual romantics, whose instincts are those of the free-lance and the explorer.

Every one of these soldiers in the scientific host is to have his little problem to work out. The question he is to ask of nature is to be precise, limited, and as nearly as possible amenable to a definite answer. In a word, he is to invade the unknown in a definite direction and to keep always in touch with his base of supplies. He is to keep in communication with the overlords of his science. He is not to poach upon the territories carefully marked out for his fellows.

He is denied the privilege of wandering forth equipped only with the rifle of his intelligence, and thus to remain for long periods of lawless and impudent penetration of the forests and jungles of ignorance. Should he be baffled by uncharted marshes or unscalable heights, it is not for him to conquer these by his unaided wit. Instead, he is to return to his director of exploration, who, as the fount of knowledge, will devise a way out of his difficulty.

To a large extent the Germans had already perfected this organization of research before the war. At the beginning of the war it was sneered at and condemned by Germanophobe scientists in America; but at the termination of the strife the Teutonic origin of coöperative research had been forgotten, and the evil effects of organized science were no longer condemned with the patriotic fervor of former years. On the other hand, the beneficent results of its activities were acclaimed on all sides.

In the instance of German science, the advantage of quantity production of researches is manifest to every one. The annual output of investigations of all kinds is enormous, and fills countless volumes of "Zeitschriften," "Zentralblätter," and "Wochenschriften." These admirably printed periodicals, filled with formidable masses of work

in all conceivable branches of knowledge, are in some respects to be regarded with astonishment and awe. It makes the rapidly growing body of scientific knowledge readily accessible; ignorance of the more recent advances in any science is inexcusable. A discovery may now be common property on the morrow of the day it is made. It has recently been suggested that the German publicity methods, now enthusiastically copied in America, be extended still further. If this takes effect, scientific advances may be heralded by efficient distributing agencies of the type of the Associated Press, which may cause newspapers to publish special editions of the character of our present indispensable sporting extras.

But this type of scientific organization in Germany, despite its manifest excellences, has brought about some evil tendencies which must fill the sympathetic observer with dismay and even with disgust. The worst of these is the tone of deference to established reputation and respect for authority that is evident among the younger scientists. The trend is toward the clerical spirit. A scientist makes a discovery of some importance, enunciates a ponderous theory on its basis, becomes a *Geheimrat*, and attracts a horde of followers, German, Hungarian, English, Japanese, American. These disciples come eagerly to the shrine, and sweat earnestly over an *Arbeit* emanating from the central great intellect of the *Herr Direktor*. The research almost invariably involves discoveries supporting the central theory. It would be considered a downright impudence for a student even accidentally to discover a fact which might be embarrassing to the

dogma laid down by the presiding priest. Thus, in such organizations, one observes the splendid and inspiring spectacle, celebrated by poets, of "a hundred minds with but a single thought, a hundred hearts that beat as one."

## § 2

This growth of the barrack spirit is spreading with rapidity in American science, especially with that concerned with the study of disease. It is, I am convinced, antithetical to the spirit of all creative endeavor. For while *esprit de corps* is laudable in an armed citizenry or in the production of bathtubs, motor-tractors, and three-inch guns, it is damnable in scientific dogma or in support of a school of music, literature, or painting. Galileo founded modern experimental physics. He was considered a heretic and an antichrist by the reactionaries of his day; but he privately thumbed his nose at his inquisitors, who then formed the only body of intellectual authority. What is more, he did not attempt to erect his laws of motion into a dogma against the church or to attract a horde of worshipfully slavish adherents to his views. The same is true of Lavoisier and Faraday and Pasteur. These men were free-lances and innovators, smashers of the contemporary idols of ignorance and superstition. It would have been absurd to ask them to bow to the reigning savants of their day. Their explorations were free and untrammelled. They would have laughed at the idea of a research council to lay out their problems, or of a director before whom to do obeisance.

To tell the truth, a genuine piece of scientific investigation is always a

highly individualized affair. And real investigators, though they may seek advice and welcome discussion of their problems, will always resent interference from above, or attempts of other minds to change the direction of their penetration of the unknown. Science stands to lose, I think, when the director of a laboratory for the scientific study of disease attempts to standardize the thoughts and methods of his scientific henchmen; for it is their very waywardness of thought and the heresy of their methods that frequently result in important discoveries.

In America it becomes the fashion to ape the Germans. Directors begin to employ disciplined scientists, with special penchants, to synthesize researches. This is just as absurd as to imagine a painter, having an admirable conception of a beautiful landscape, who would proceed to its creation by employing a corps of specialists, one to paint the trees, another to do the hills, a third to daub in the cows, and a fourth to fashion the pretty dairymaid who milks them. A great painter has an arrogant belief that he alone is capable of executing each of these details in the proper manner. A great scientist is equally mistrustful of the experiments and results of his underlings. Despite this, the *dernier cri* in the American study of disease seems to be that of a great brain, having many splendid ideas, sitting in an attitude of profound abstraction in a secluded cabinet, and parceling out the products of his cerebration to awe-struck underlings who hurry to their laboratories to prove the validity of the concepts of the master intelligence.

The number of men engaged in the study of disease increases constantly.

It may be objected by those who favor the idea of scientific directors that there are many men in the ranks of this rapidly growing army who have not the originality necessary for the elaboration of intelligent concepts. The question arises as to the disposition of such persons who have faithful and clever hands, but wooden heads. The answer is plain. Such persons should not presume to the rôle of investigators. What, then, is to become of the great brain, with its volcanic eruptions of ideas? The answer is clear. Its possessor should work out and test his own concepts. It is true that such a procedure would greatly decrease the productivity of the active intelligence; but, on the other hand, he would have the priceless opportunity to see and to do his own experiments, and not merely to examine their results with satisfaction or disgust, as the case might be. Most surprising and unexpected turns of events occur in the course of an experiment. These accidental and unforeseen results are frequently ignored by the henchman who has manual cleverness, but not an alert or questioning mind. The French physiologist, Claude Bernard, insisted that his most important discoveries arose from accidental observations made in experiments the objectives of which were in an entirely different direction. The same remark has been made by the Belgian immunologist Bordet. This investigator does all his experiments himself. He doubtless has a thousand ideas that he has not the time to put to test; but, despite this, he has found time to advance the science of immunology more than any other living man.

It follows that the only kind of permissible assistance in the science of the

study of disease is the kind that functions under the very eyes of the directing intelligence. This can be procured by the employment of personally trained technicians, or of youngsters just making their bow in the field of research. Such help is far less expensive than that of the unimaginative superworkers calling themselves scientists who now largely infest the laboratories for the study of disease. The abolishment of the idea of a scientific directorate would greatly reduce the number of scientific workers. This might be lamented, but only by those who seek to mitigate the evil of unemployment; for it is certain that fundamental advances in the science of the study of disease are not increasing in proportion to the augmenting numbers of investigators.

There is really not the slightest hope of such a healthy purgation of the ranks of the students of disease. The institution of the scientific directorate becomes more popular and more firmly established. All that can be hoped for is the occasional accession to power of broad-minded, tolerant overlords who do not tyrannically exploit the power that is given to them. These lines are not penned as counter-propaganda, which would be fruitless. They are written as a sort of Jeremiad over a system which tends to make the investigators of disease an aggregation of paid house-cretes, subservient to dubious generalissimos, rather than an association of independent and wide-ranging knights, who prefer to explore alone the dangerous lands and to slay unaided the horrible dragons that plague us.

## § 3

The inroads on our valuable forests and the increase in the number of

pulp-mills in America arising from the plethora of scientific periodicals on medical subjects are largely due to the great number of persons unjustifiably usurping the function of investigator. These realize that the regular appearance of their names in periodicals will increase their prestige and afford them opportunity for better places, with greater emolument. This results in a flood of periodicals with inane repetitions of previous work and empty investigations of inferior quality. Such a mass of material makes it a difficult task to keep abreast of real scientific advance, since it produces scientific libraries of labyrinthine complexity.

Such an avalanche of publications makes it difficult to discriminate between good work and bad. Let a man write in a sufficiently persistent and voluminous manner, and he is almost sure to gain a hearing and to be respected. Thus it may happen that the name of any person whose scientific product is inferior or even erroneous will be on the lips of every one. Such is the case of a well known German biochemist. On the other hand, names like that of the American bacteriologist Elser are obscure and little known. This savant has published a single *magnum opus* that belongs to the classics of his science, yet it is safe to estimate that the majority of American students of disease are hardly aware of his existence.

Another cause of this promiscuity of publication is the wild desire for priority. The majority of workers are in a constant state of fear that some colleague will rush into print just ahead of them. This phobia results in an unnatural, strained effort and in a fatuous spirit of competition. Work is done under a pressure which usually



results in researches that are incomplete, hurried, and botched. Unhappily, the isolation and parochialism that enabled Leonardo da Vinci to spend more than twelve years on the famous "Cenacolo" is no longer with us. The student of disease works with one eye on his experiment, the other searching anxiously for the publications of those he knows to be laboring in the same field. The investigator fears his associates will think he has lapsed into innocuous desuetude if he fails to publish a paper for a space of two or three years. George Moore asserts that the invention of rapid means of communication has resulted in the death of art. His position is probably extreme, but it is certain that the science of the study of disease suffers greatly from the lack of isolation and leisure necessary to strictly original effort and to exquisitely finished work.

Finally, the abundance of scientific reading matter leads to another serious danger. Many investigators do not go to nature for their problems. They seek them, rather, in the library. Thus, one of America's leading pathologists remarked in passing that he had read something "while in the library, searching for a problem to work on." This person is generally held in high esteem. His name is ranked among the ten most prominent investigators in his branch. Yet it is almost certain that research starting from a perusal of the work of others holds the danger of preconceived ideas which are entirely out of place in science. It is impossible to imagine Harvey searching the mystical books of Galen for the inspiration to his work on the circulation of the blood, or of Pasteur initiating his fundamental researches by a consultation of

the inane medical speculation of his time, or of Bordet turning the strong beam of his lucid intelligence on the dark questions of immunity by perusing previous literature on the subject. On the other hand, these investigators, and other great ones like them, began their searches by the observation of natural phenomena that impressed them as important. They formulated hypotheses on the basis of these observations; they then put these hypotheses to test by careful experiment.

The fruitful study of disease really began with the investigations of Pasteur. Before this time isolated careful observations and a few brilliant experiments had been made by lonely investigators of the type of Harvey, Leeuwenhoek, Spallanzani, and Magendie. But the seeds of these experiments fell upon unproductive ground. These men were far in advance of their times; they worked in a *milieu* of superstition, ignorance, and bigotry even more appalling than the one existing at the present time. Pasteur was a chemist and carried the careful methods of that science into the study of the mysteries of disease. He was laughed at and bitterly opposed by the majority of medical investigators. A few enlightened ones finally realized the importance of his discoveries, and at last a multitude of scientists began to flock to his support and to elaborate his researches. But it is curious to relate that very few of them consistently used his objective methods, or shared his conviction of the physico-chemical nature of the mechanism of all living processes. Instead, the majority employed the morphological methods of the German pathologist Virchow. This savant had insisted upon the importance of microscopic

observation and description of changes occurring in the cells of diseased organisms; he cared little for the elucidation of the mechanism that gave rise to these changes. Such study as that of Virchow is immeasurably simpler than the experimental method of attack, especially when the latter is based upon the methods of physics and chemistry. So it was natural that descriptive science would appeal to medical men wishing to enter the field of investigation, but who were innocent of the precision of method necessary to the chemist or physicist. It consequently became the mode to describe the appearance of things rather than to investigate their mechanism. This spirit spread rapidly from Europe to America, and by the early nineties of the last century Americans were vying with Europeans in the discovery of new bacilli and in admirable and lengthy description of the appearance of diseased tissues. Scant attention seemed to be given to the fact that men like Pasteur cared little for descriptive science, but probed always into the mechanism of phenomena.

It was a relatively easy thing to make startling and dramatic discoveries in the days following the investigations of Pasteur. New phenomena were exposed with the greatest ease, in much the same manner as prospectors might uncover rich veins of ore in a new and unexplored territory. Thus it happened that men of no more than mediocre ability became famous by the attachment of their names to a bacillus causing a disease or to some new phenomenon requiring rather simple means for its demonstration. This type of research was largely qualitative in nature. It did not demand the meticulous care necessary to ac-

curate physical and chemical experiments. It was consequently easy of accomplishment by persons with the rough training and vague methods of thought current in the medical world. It flourished in America, for our nation is notoriously the land of the slapdash, sloppy type of activity. As a result, the majority of medical research for the first thirty years after the ground-breaking work of the French and Germans is of a nature causing conscientious investigators to blush.

On the other hand, it is true that a few American experimenters deserve to rank with the European Nestors in the study of disease. The most prominent of these are F. G. Novy and Theobald Smith. Both of these men refused to be pushed into that insane fury of competitive effort and indiscriminate production which is laudable in the manufacture of brass cuspidors, but entirely out of place in science. The investigations of Smith in Texas fever and tuberculosis, and of Novy on relapsing fever and the trypanosomes, belong to the real classics of bacteriology. These men employ the exactness of technic and the painstaking accuracy necessary in chemistry.

The multiplication of descriptive research and surface explanation led to confusion and finally to stagnation. The rapid uncovering of surface phenomena began to slacken; it seemed that the students of disease had advanced to the foot of an unscalable cliff. The cause of this sterility after brilliant beginnings is not far to seek. It was due, without doubt, to the failure to recognize thoroughly the necessity of the quantitative methods of physics and chemistry, which involve a patience and relentless rigor foreign

to the majority of the students of disease.

§ 4

It is gratifying to relate that the possibility of an entirely new attitude in the study of disease is beginning to appear in America as well as in Europe. Physical chemists are at last beginning to invade the jungle of contradictory facts in which medical investigators wallow. In Europe the movement began with the quantitative investigations of Arrhenius and Madsen in immunity. The Dane Sørensen and the German Michaelis have made great strides in the field of biochemistry, and begin to lift that body of knowledge from its cook-book status.

The American protagonist in the spirit of quantitative physicochemical investigation of life phenomena is Jacques Loeb. Although his work is in the field of general physiology, which seems far removed from that of the problem of disease, in reality this remoteness is an illusory one. His illuminating researches on the nature of proteins should be capable of early application to the study of disease. His efforts begin to attract followers from the ranks of physical chemists. In the field of biochemistry the names of Van Slyke, Folin, Falk, and others are connected with quantitative researches, with definite application to the problems of disease.

It is necessary to attract physicists and chemists to the study of biology and the problems of disease. This will be difficult, since such men are rapidly befogged by the bewildering mass of fact and the still formidable vestigia of medieval medical jargon that it is necessary for them to master. Again, they recognize the great complexity of

vital phenomena, and do not feel comfortable in the presence of the numerous difficultly controllable variables that are inherent in the mechanism of living organisms. Accustomed to be accurate to the third and fourth decimal place, they naturally shy at experimental errors of five per cent. Finally, they doubtless resent the attitude of the majority of eminent medical investigators who regard them as mere handmaidens and presume to map out problems that can be solved only by their knowledge and technic. This is, once more, a manifestation of the evil of the medical director of research who sits in his remote office evolving problems, calling in turn upon physicists, bacteriologists, and chemists for their solution.

It follows that any rapprochement between genuine scientists, such as physical chemists, and embryo investigators of the type of the majority of students of disease must be in the nature of a free collaboration. The chemist must have a real interest in biological problems. These are actually rather simple in statement when the fog of superfluous data and idiotic speculation is removed. Until medical educators realize that the prospective students of disease must have a really thorough training in chemistry and physics, and until they are able to teach their subjects from this point of view, it will be futile for medical graduates to attempt unaided investigations of this type. Inadequately trained, they tend to apply the sloppy methods of biological and medical research to the exact science of chemistry rather than to introduce chemical methods into biology. All that is possible at present would seem to be the collaboration referred to above.

# Our Medicine-Men

By ONE OF THEM

III—How Are We Educating Our Doctors?

Drawings by CLARENCE DAY, JR.



NOTHING could be more disconcerting to the observer of the trend of medical education than the confusion and cross-purpose that exist in regard to the kind of preliminary study necessary to those who aspire to become physicians. This lack of agreement is due, without doubt, to the *bouleversement* caused by the new importance of science in medicine. Many points of view exist among the professors whose duty it is to train physicians. Some insist that the doctor requires a broad cultural training. They demand that he should be versed in Latin, so that he may write his prescriptions accurately. He should, in addition, have a good knowledge of Greek, so that he may be able to unravel the meanings of the enormous number of recondite words existing in the mystic jargon of physicians. What is more, the growing politico-socio-economic importance of his profession requires that he have a knowledge of economics and political science and sociology. Again, since his *métier* carries with it the necessity of social prestige, he should be able to discourse upon the Elizabethan dramatists and upon the intellectual accomplishments of Neanderthal man. It is evident that the acquisition of such a vast body of irrelevant and unrelated knowledge

requires several years of preliminary college training.

The apostles of the necessity of broad culture are opposed by educators who are convinced that the basis of medicine is now scientific. They count the ideas of the whoopers for broad culture as amiable bosh, and insist that the three or four years of preliminary training of the medical aspirant be devoted to science rather than to the acquisition of high-sounding nonsense.

Between these two opposing camps stand those who desire to compromise. These educators wish to combine the study of scientific and cultural subjects in a two-, three-, or four-year pre-medical course. This idea is probably at present in the ascendancy, despite the fact that it is manifestly impossible to receive thorough training in either of these two fields in so short a time.

The method pursued by the majority of prominent medical colleges is to require two years of pre-medical (mainly scientific) study, and to make a three or four years preparation optional to this. This system leads to great dissatisfaction, especially among the few students who have completed a college degree before entering the actual study of medicine. These persons are faced by two disturbing facts. In the

first place, the average youth will not for a moment consider lingering in the academic grove for four years when he can plunge into what he considers the real preparation for his life's work after two short years of preliminary study. Hence the more adequately trained person finds himself in the demoralizing position of associating with persons who are obviously his inferiors in training, but who suffer no ostensible disadvantage in their actual medical studies. What is worse, he finds himself in the rear of persons who have confined themselves to the minimum requirement of the pre-medical two years in some minor college, and who, as third-year men in medicine, consider themselves to be vastly his superiors.

Another condition, still more disintegrating to the morale, faces the student who comes to the study of medicine after four years of good scientific preparation. This youth, following the advice of those supposed to know, has been convinced that the foundations of the intelligent study of medicine lie in mathematics, physics, and chemistry. He enters the first medical courses with confidence, aware of his superiority over the majority of his fellows. It is easy, then, to imagine his dismay when he discovers that he knows far more of physics and chemistry than many of his medical instructors, and finds himself surrounded by glib-memored, poorly prepared young ignoramus who shine by reason of their parrot-like ability to reel off an enormous number of unrelated facts crammed out of textbooks. The better-prepared person, whom a training in mathematics, physics, and chemistry has taught to question and to think rather than to

remember voluminously, idiotically, and indiscriminately, finds himself in the rear ranks, and is apt to turn with bitterness upon those advisers who had the effrontery to pretend that the basis of medicine is really scientific.

The person thus trained in science who discerns the preposterous nature of this intensive intellectual stuffing, thereupon pays less and less attention to its pursuit. As a result, he begins to be looked upon as an inferior student, and generally becomes offensive to the nostrils of the anatomical instructors. These, in faculty meetings, transmit their opinion of the unhappy student's ability to their colleagues of other branches. This stigma is likely to cling to him throughout his career in the medical course.

On the other hand, the student may plunge blindly, but manfully, forward, spending whole mornings in classrooms, entire afternoons in the laboratory, and after a hastily snatched dinner, consume untold energy in a diligent, but befuddled, effort to memorize a sufficient modicum of each of his subjects to make a presentable showing in the class-room next day. He rarely has a moment for the thoughtful consideration of disease as a whole or of the organism as a whole. At last, as the end of the course approaches, he gathers himself together for a final supreme orgy of fact retention. On the day of the examination he regurgitates this body of knowledge to the best of his ability, and then with a sigh of relief proceeds as rapidly as possible to forget it, so that his tired brain may be cleared for the reception of new masses of doctrine in the ensuing courses.

This process of alternate stuffing and spewing goes on for two, indeed,



He should be able to discourse with authority

in the majority of colleges, for the better part of three years. Toward the end of the second year the student begins to look forward with a thrill of anticipation to his coming work in the hospital. Here at last he feels that he will be rid of the strain of the mastication and partial digestion of many apparently unrelated bodies of doctrine, and from the anxieties that attend their periodic regurgitation in examinations. During the interval between the termination of the laboratory courses and the beginning of the much-desired practical hospital studies, he does his best to forget the nightmare of the preceding two years, and so finds it easy to shed the uncomfortable mass of knowledge that has crowded his brain. In consequence, by the time he is well on in his third year and is beginning to devote his time more and more to the work at the bedside, he has become almost totally innocent of the staggering array of fact with which he was bedeviled in the laboratory courses. He begins to view those earlier years as a terrible experience, as a desert strewn with

skeletons, which must be crossed by adventurers who would win to the promised land of practical work in the hospital.

The gap that the student consciously realizes to exist between the laboratory and the hospital work of the medical course is also apparent in the underground, and sometimes open, hostility existing between the laboratory and clinical professors. The former are properly indignant at seeing their efforts flouted by the fledglings who have just taken up hospital work. They resent having to spend hours in preparing materials, in demonstrations, in long laboratory periods, in the routine of hammering facts into the heads of a heterogeneous assortment of numbskulls, only to see these same dunces favor them with grimaces and leering smiles of condescension after arriving at the dubious dignity of hospital study. The professors of the sciences undoubtedly think that part of this *mépris* is subtly inculcated by the clinical teachers. These last, recipients of princely incomes, owners of motor-cars, necromancers of bedside

lore, are held in vastly greater respect by the majority of students.

This opposition between laboratory and hospital, almost invariably existing as an undercurrent, at times flares up into open strife, dividing the clinicians and the scientists into armed camps, which engage in justs for ascendancy in the college. Such battles are of a quality of short-sightedness and nonsensical emptiness that would cause them to be regarded as the caperings of buffoons were they not so deleterious to the progress of medical education. They result in a reduction to absurdity of any attempt at the liaison that should exist between the laboratory and the hospital.

These conflicts are due largely to a confusion of ideals in the medical profession. Until medical educators resolutely face the fact there is no such thing as a science of medicine, and that the study of disease is a matter distinctly apart from the art of healing, the existing confusion will only be multiplied. At the present time the first two years of medical instruction assumes that all of the students are to become investigators of the problems of disease. Each person is held to the same criteria of excellence or, to be more accurate, of mediocrity. Excepting in institutions of the type of the Johns Hopkins and Harvard University medical schools, specialization in the laboratory branches in the earlier years is discouraged. The teaching is directed at the divine average lauded by that prophet of democracy, Walt Whitman.

After the mob of individual units with heterogeneous talents and aptitudes has been treated for two years as if each one were an embryo scientist, it is subsequently propelled into the field of practical endeavor in the

hospital. This kind of work is entirely antithetical to the spirit of science. Persons who, fired by a spirit of inquiry, might wish to stop and investigate the nature of an interesting case of exophthalmic goiter, are hurried by the recitation-bell to attend a séance of obstetrics, which they may consider to be empty and inane. The final year of the medical course is devoted to a bewildering profusion of subjects, comprised mainly of various lucrative specialties. These subjects are taught by so-called clinical "professors" of dermatology, of otolaryngology, of ophthalmology, who increase the prestige necessary to their commercial success by the wearing of academic robes. So the callow undergraduate of the fourth year, who should occupy all of his time with the arts of clinical and laboratory diagnosis and with the craft of surgery, controlled by the discipline of the necropsy, is enticed into premature ambitions to specialization.



He regards with an evil eye his glib-memorized classmate

Now, to add to the *mêlée*, come those who demand that this wonderful *mélange* of opathies and ologies be welded into a *science* of medicine!

This brings about a confusion twice confounded. The clinical professors are right in their resistance to the attempt to turn the hospital of the medical school from a place for the teaching of diagnosis and surgery into a glorified rabbit-hutch where the patients are looked upon as experimental animals.

This critique may be objected to as destructive and as leading to no solution of the problems that are at present vexing to medical educators. This is, however, by no means the case. For the moment it is understood that medicine cannot be turned into a science, and that it would, on the other hand, be a lamentable nullification of its progress to make it entirely practical, the way is open to sweeping changes which would greatly clarify the present murk of cross-purpose and misunderstanding. What is necessary is a sharp delineation between the practical sheep and the scientific goats. This should take place at the very beginning of the medical course. The great majority of persons entering medicine have no intention of making their *métier* the science of the study of disease. It may be remarked, in passing, that this is very lucky for science. Rather, the rank and file of embryo physicians enter the anatomical laboratory of the first year impatient to grasp the stethoscope, to feel the pulse, to wield the surgeon's knife.

These persons could be exposed to *rudimentary* courses in the fundamental scientific branches. They could be taught anatomy from its practical side, and not in the present encyclopedic fashion. They could leave the inane recitation of the list of cranial nerves to persons who display a liking

for intoning. They might be given a short, but thorough, drilling in that part of bacteriology bearing upon disinfection and asepsis. They might be shown the microbes of diphtheria and



The student's nightmare over the great mass of medical knowledge

of typhoid fever in demonstration, but not put through the present comic attempt to isolate and differentiate them by the complex technic necessary to this practice. In physiology they could be taught those aspects of the subject which bear upon the immediate comparatively simple problems of the diagnostician or surgeon, and not stuffed with complex considerations in regard to the nature of osmotic flow or antagonistic salt action. In biochemistry they might be made privy to the simple analyses of urine and blood, which they will perform as practitioners, and not be flabbergasted with the complex methods used in modern biochemical experimentation. In pathology the emphasis for them would be laid upon those changes in diseased tissues visible to the unaided eye at the necropsy. This last might well be initiated in the first year and continued throughout the entire course. Its constant practice, and the rigid comparison of its findings



with the diagnosis of the case before the patient's death, would do much to introduce intellectual rigor into the art of diagnosis. This would make the detective work of determining the nature of a malaise less the amiable guessing game which it is at present.

As the time approached for labors in the hospital, the importance of intimate contact with the teacher would be insisted upon. In short, there would be a return to the preceptor system in vogue in America in the early part of the nineteenth century. This system recognized that the lore of medical practice and the craft of surgery are to be learned best by the method of apprenticeship practised of old by doctors, and still common in the honorable guilds of plumbers, brewers, and glass-blowers. This would be greatly superior to the present alleged bedside teaching, where groups of from six to twenty students simultaneously endeavor to absorb the wisdom of a single instructor.

The rudimentary nature of the laboratory instruction given to the majority of students whose intentions were avowedly practical would leave time for the intensive and elaborate scientific instruction of the few persons whose bent really lies in the direction of the study of disease. Such men now and always will constitute an insignificant proportion of any medical class. Consequently, they would be enabled to work in intimate contact with members of the scientific staff, who under such a régime would have leisure for uninterrupted investigation, and would not, as at present, have to perform their experiments at lunch-time, between recitation periods, or in the dead of night. The greater part of the time of these instructors is now

given to the hopeless attempt to inculcate the facts and *esprit* of science into an indiscriminate assortment of youths, all but two or three of whom do not, and never will, know "what it is all about."

Under the prevailing dispensation, one of two methods is open to the teacher of the laboratory studies. First, he may aim at the diligent hammering of his theories and facts into the rank and file of the class, who have little understanding and less respect for them. In so doing, he necessarily holds back the students who have a natural aptitude for the subject. This is the democratic method, and is in favor, it is sad to relate, in the great majority of medical schools. Second, he may direct his efforts toward the bright and understanding ones, and allow the majority to remain frankly in the state of mystification in which it is natural and inevitable that they should exist. This is the aristocratic method, and is generally frowned upon and discouraged.

The plan of early sharp division of those wishing to be practitioners of medicine from the ones aiming at the scientific study of disease would certainly make it possible for the latter to test their metal in research. What is more, it would release the practically minded youths of the majority from mystified gropings in a fog of fact and doctrine that must remain for always incomprehensible to them.

These ideas are in practice to some extent at medical schools of the type of the Johns Hopkins and Harvard. These institutions are, however, severely criticized by the majority of medical educators. They are alleged to create a high-brow spirit and to fail to turn out an adequate supply of the "prac-

tical doc." The critics pride themselves on being professors in colleges which produce "all-round" physicians. They perhaps do not realize that they aid in throttling at birth a number of persons whose scientific work might have been of great value in the study of disease. Now, it will be clear that under the plan suggested above all medical schools might produce men capable of becoming good practising physicians or competent surgeons, and at the same time afford facilities for the production of a constant small number of high-brows without whom advance in medicine would be impossible.

The present strictures made by some medical educators against the high-browism of certain of the great Eastern schools are undoubtedly justified to some extent. And the teachers in the latter are right in accusing the rank and file of medical colleges of suppressing science, and by their philistinism reducing their institutions to the level of mere technical schools.

The plan of returning to the preceptor system for practical students in the hospitals will be criticized on the

ground that the number of youths is too large to make such an idea feasible. As things exist now, only a few endowed institutions are able to limit the number of their entrants. The state universities have been founded with the idea of educating all persons whose parents have the funds and the social aspiration to send them thither. Any idea of limiting arbitrarily the number of students in the medical school of such a university is scoffed at as impracticable and intolerable to the citizens of our democratic commonwealths. Under present conditions such a medical department is required to accept as first-year students a constantly increasing number of applicants. All that is asked is that these pass satisfactorily the two years' hodgepodge of pre-medical requirement. There is not the semblance of an attempt at the selection of prospective physicians on the basis of a predilection for the art of healing or of a *penchant* for the study of disease.

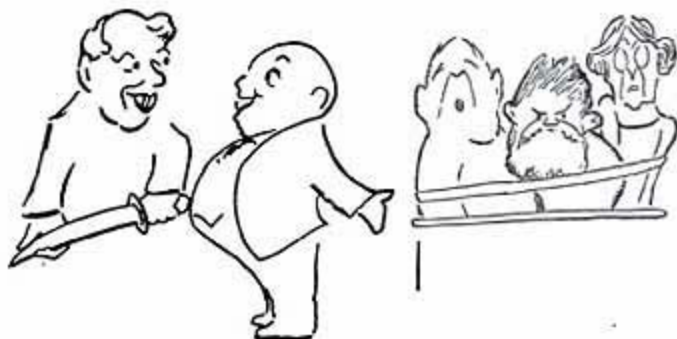
The constantly increasing munificence of the various medical specialties is attracting to the study of medicine an always greater number of undesir-



The teaching is directed at the divine average

ables of a greedy acquisitiveness, with no notion at all of the essentially religious nature of the art of healing, and with no reverence for the high calling of the science of the study of disease.

of equality. This could be effected not by setting up an arbitrary numerical limit or by constantly increasing the number of years of required pre-medical preparation. The latter



Where the patients are looked upon as experimental animals

They scoff at disinterestedness. They talk constantly of specialties which will afford them the best incomes. Medical schools are at present thronged with such pests who, having no spirit of disinterestedness to begin with, naturally become more materialistic as they near the goal of their ambitions. It is this species of gouger who drives out the last struggling representatives of the splendid old type of general practitioner, and who makes a commercial obscenity of the pretentious new institution of group medicine.

The present dissertation is not for a moment to be considered as a polemic against equalitarianism, which is doubtless with us to stay. It would be as futile to attempt to put it down by argument as to talk the pyramids of Rameses out of existence.

It is really entirely possible to limit the number of medical aspirants, even in a state university, without offending too grievously our zealous guardians

scheme has been tried, and does little to reduce the number of incompetents and undesirables. But it might be brought about by a rigid system of entrance tests. These examinations could be of two types, the one suitable to college graduates whose aim it is to be practitioners or surgeons, the other adapted to the training of the graduate in science who enters medicine with the purpose of the study of disease. Such tests, if based upon thinking ability, and not devoted to the discovery of the irrelevant encyclopedic knowledge of candidates, would reduce the number of entrants with appalling rapidity. Of course it is granted that such suggestions are impossible of realization so long as the faculties of medical schools point with pride to classes of one hundred and fifty students. So long as the aim of education is the standardized production of intellectual Fords, it is a palpable fatuity to recommend methods

which might result in the completion of an occasional Locomobile.

With a medical education rearranged according to these suggestions, it might be possible to mitigate the intellectual flabbiness that is rampant in the medical profession. This vagueness and lack of mental rigor are notorious in physicians. A recent army-intelligence test showed doctors from civil life to be sixty per cent. below engineers, and but little superior to veterinarians. There may be some reason to criticize the accuracy of such tests and to assign a large experimental error to them. On the other hand, their results only confirm the opinion long held by close observers of the two professions.

The cause of the high average competence of engineers and of the intellectual muzziness of most doctors is to be sought in the very nature of their respective callings. The engineer works in constant fear of a catastrophic revelation of any blunders he may make. If he bungles his calculations in the construction of a bridge, the structure may collapse under the weight of a trainload of important people. The burden of such an appalling disaster will then in all probability fall on his shoulders after having been traced to his error. He is for this reason held up to a high level of intellectual rigor. He must be exact. His bluffs and uncertainties and cheatings will return upon him with the accuracy of well-aimed boomerangs.

Now, it is evident to every one that this is not the case with physicians.

A high discipline was practised upon surgeons and other physicians by the ancient Babylonians, who legally punished certain mistakes by cutting off the hands of the bungler, and who rewarded more serious ones by a summary removal of his head. This plan was plainly of merit, and the number of bluffers and shysters among the doctors of Babylon must have been noticeably reduced. Under the existing régime, the bungling doctor is protected by his fellows under the conspiracy of silence euphemistically entitled "medical ethics." He may insure himself against malpractice, and large funds are at his disposal to hire clever lawyers who may be able to free him, no matter how glaring his culpability. It is admitted in the guild that many patients are killed through ignorance or downright blundering. It is, however, perfectly easy for physicians to palm off such mistakes on the irony of fate, the cruelties of a just God, or the inexorable and insurmountable whims of nature. It is difficult to deny him when he maintains that the patient has passed away *despite* his skilful efforts. On the other hand, it is almost invariably the custom for him to claim a cure as his own when nature may in reality have effected it. The patient and family are, for reasons elaborately explained in preceding chapters, prone to accept the intervention of physicians as decisive. It is easy to see how these conditions bring about a general spirit of evasion on one hand, and a pretension to unreal power on the other.