A system of personal biologic examinations the condition of adequate medical and scientific conduct of life / George M. Gould.

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The ranchman has his annual round-up; the merchant his yearly account of stock and balancing of books; the machinist gives his engine a thorough going-over at regular intervals; every military organization has its reviews and inspections, every government its budgets—indeed, every financial hair of the commercial head is noted, and not a sparrow of the hunter, Success, falls to the ground unnumbered; those that do not fall are even more accurately numbered. But it is not so concerning the one piece of mechanism that conditions all these things, and that is the most valuable of all earthly possessions—the human body. For all practical consideration a man's body is his life, and yet civilization has come so far without any systematization of the business and mechanics of the entire single and personal life. The science of bodily living in its complete extent still awaits its discoverer. Numberless philosophers treating of the conduct of life have soared in superficial inexactness and easy generality over the heads and hungers of the individual liver, but they have utterly failed to formulate the physiologic and pathologic con-

*Presented to the Section on Practice of Medicine, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.

ditions of success and failure. All the biologic and medical special sciences have struggled toward an unreached unity; all are single rays, as it were, awaiting the lens of a focalizing intelligence to illumine the concrete image of our total physical appearance here. War has devised a rough and crude system of physical examinations for the would-be soldier; insurance companies have more accurately examined the bodies and life-prospects of their policy-holders to estimate their financial risks; through the Bertillon system, criminology has still more perfectly fixed the anatomic measuring of the bodies of the lawbreaker; the Amherst and Harvard examinations have looked into the muscular functions of a few students for four years of their lives; the psychophysic laboratory has measured a few neurologic reactions; the medical practitioner has found out a few ways of reaching backward to the etiology of some single diseases; a few hundred school children have been subjected to some tests as to growth and the influence upon organization of poverty and wealth. But all these, I believe, are sporadic and ineffectual hints of a coming science of man, based upon a thoroughgoing and repetitive system of physiologic and pathologic examinations which will ultimately give us a genuine and all-comprising science of anthropology based upon all the data, morphologic, physiologic, and pathogenic, of the entire individual life. Prophecy and prognosis are based upon a thorough knowledge of the past and present fact, a rigid understanding in a scientific sense of the evolution of the organism and of its present departures from a normal standard. For his children a foresighted man must wish such an accounting, such a prophecy and prognosis; and as to himself every intelligent adult, when he awakens to scientific consciousness, must try to look forward through the years, and reckon up his powers and possibilities of life. This most important function of prevision has heretofore been left to the gypsies, the palmists, the astrologists, and the clairvoyants! Is it a wise way for science to leave the individual struggler, unconscious and ignorant of his own body and its fateful laws, incapable of learning the scattered and ununified half-sciences blindly converging

to some far-off unity of mutual helpfulness and life? The crowning work of scientists is to turn science into prescience. The unification of the sciences dealing with the conduct of life; the making practical and useful our knowledge of the individual organism; and lastly to establish a scientific prescience—such are the ideals of a living anthropology.

Is it not at once plain that these ideals can be realized only by a system of periodic examinations and records made every year or every five years, throughout the life of the individual organism? Such a system of records may be held generally to comprise the following elements:

1. *The hereditary datum.*—The endowment at birth, the influence of heredity, must in every way govern and condition the development of the organism, and modify every reaction to environment. It is wise therefore in all ways possible to fix, at the opening of life, what is this datum of inheritance. Nationality, ancestral and genealogic histories, craniology, cerebrology, etc., help to make up the estimate of this factor.

2. *The developmental and historic record.*—Especially during the period of growth—childhood and adolescence—should the space between the annual or quinquennial systematic examinations be historically epitomized. The strains, work, illness, and tasks conquered or incomplete, are surely a necessary part of the life-chronicle.

3. *The morphologic or anthropometric examination is fundamental.*—In this the Bertillon system, modified, perfected, and expanded, or something similar, should form the basis of such a system of physical measurements, descriptions, and records, statistic and graphic, that any future variation of the organism would be detected in later examinations; and thus would be preserved the morphologic picture of the individual for the whole life.

4. *The physiologic record* would include the testing and tabulation of all the significant reactions and functions. These would be made up of all necessary dynamic tests of the muscular system; of statements of accurately observed metabolic and nutritional functions;

the reactions and reflexes of each of the special senses, and of those of the neurologic and psychophysic systems. The profound influence of habits, both positive and negative, innocent or harmful, should also be remembered.

5. *The psychic or intellectual datum* is one too carelessly ignored in scientific and anthropologic studies. The fundamental qualities of character, disposition, memory, sentiment, religion, reason, morality, education, etc., are powerful influences acting upon and reacting to the environment and to disease, and if they are left out of the count a most valuable determinant of scientific prescience is lost.

6. *The pathologic element* is one heretofore almost or utterly ignored in anthropologic studies, and in instructions as to the conduct of life. The profession should urge its profound importance. The examinations at stated periods should in large part consist of the records of the findings of expert medical specialists secured by all the arts and instruments of diagnosis at their command. All departures from health and normality that indicate pathologic results or tendencies in any organ, or in the organism as a whole, are absolute conditions of estimate as to present powers or prospects. One is almost inclined to think that the savings in medicolegal cases, by such a system of examinations, would defray the expenses of making them. Some time ago a railway company, after several years of legal proceedings, was forced to pay a man $10,000 damages for intracranial hemorrhage said to have been caused by a fall from a car. When the man died there was found in his brain a bullet which had been received 25 years previously in the Franco-Prussian war, and this had produced all the non-feigned symptoms for which the railway had to pay.

7. *The factor of heredity* closes the circle, with the possibility of making more accurate the knowledge of the transmission of the individual endowment to the child. Successive generations are but the completion and extension of a single personality. The family is the realization of the incomplete individual.

Leaving out of consideration the questions of the

onerousness of the task proposed, and the apparent impossibility of carrying out so many observations, one may ask as to the feasibility of keeping the records of such a series. The answer to this query points to the most remarkable plasticity and adaptability of the modern plan of record-making by the card-system, with its ever variable and extensible use of loose leaflets or cards of different colors, numbers, ear-marks, sizes, etc. Photography, the kromscop, the phonograph, the instruments of the physiologic and psychophysic laboratories, and those of every specialist in medicine, make it easily possible to condense the chronicles of all tests and examinations in an inexpensive and effective way. The post-mortem records, and the preservation of the brains, and, perhaps, of the skulls of the subjects, would supplement the work.

As has been intimated, we already have the beginnings, the sporadic attempts, and detached parts of such a system of examinations. The Bertillon criminal records of the police bureaus, the anthropometric data of military examinations, the results of athletic and gymnasium tests, those of psychophysic laboratories, the medical examinations of school children, and those especially of life-insurance companies, etc.—all these indicate the thought, labor and expense which civilization is giving to the problem. But the most important of all contributions might be the case-books, hospital records, and patients' histories of physicians. Hardly a tithe of the precious material, however, is utilized The waste of biologic data—wasted because not systematized and unified—in the lost records of physicians is appalling. The most valuable books in the world are the oldest city directories, scientific statistic records, etc., and more valuable still would in future years be the present-day case-books of scientific physicians, if they were well kept and illuminated by a statistical and scientific judgment. We now dump them into the pulp-mill.

Is it a foolish dream, is it an unrealizable ideal, that all these things might be preserved, and rendered of use to science and humanity by some institution carried on by the government, by a university, or by a union of scientific and medical men, whereby the records of indi-

vidual lives might be made so frequently, so continuously, and so scientifically that we should at least gather the inductive data for a genuine science of anthropology, pathology, and ethical biology? If governments could be prevailed upon to devote to this work one-tenth the money now squandered in war; if legislators could be prevailed upon to give to it a small proportion of their stealings and political plunderings; if a fraction of the money poured into the pockets of the ward and city bosses could be got; if a small percentage of that spent on comic opera could be shunted this way! If these are idle dreamings is it not perfectly possible that in future ages some wise legislator of some civilized government may convince his fellows that not only is this the duty of the national administration, but that the very beginnings of the system are already in operation in the national census-taking. In this the mechanism is really inaugurated, and needs but the inclusion of the civil service examination, the soldiers' entrance tests, and the governmental pensioners' medical examinations, to bring it a long way toward perfection. With the plan once determined upon, and the brain once found to gather the haphazard and discrete parts to an organic unity, but little additional expense would be incurred over that now spent in the separate systems. Indeed, the scheme itself is only an extended and a perfected bureau of vital statistics. Once such co-operation were started, the city and state with their criminologic statistics, the insurance companies with their accurate vital and pathologic records, and especially the medical profession with its systematized records of individual and social morbidity, and many other agencies, would be drawn into co-operation, and the bases of a truly inductive and physiologic science of civilization would begin to be laid.

While we wait for that millennial palace of Science we physicians need not be idle—nay, we may be at work in the quarries. Our first duty is to reorganize, systematize, and make scientific our case-books and recordings of patients' histories. Let us study this great and neglected art so that these most precious fruits of our life-work shall not end in the pulp-mill. The lack of

literary workmanship in making and keeping our records of disease is altogether deplorable. What is left to science of the life-work of a million physicians whose business has been with the most precious biologic facts of the world? Can we not perfect some bridge whereby the results of our life-labors can be carried over the stream of death and become the property of general biologic and pathologic science?

Surely then, our second duty is to make our science prescient, by means of the repeated examination at stated intervals of those patients whom we can convince of the necessity and wisdom of such a proceeding. It is a shame of medicine that in the one department of our science which we are most foolishly inclined to look down on with too much superciliousness, its practitioners have outrun us. The dentists have long recognized the need of periodic examinations of the special organ, regardless of symptoms, and they have at last driven the knowledge into the minds of their patients. Thousands of patients have their teeth periodically examined for beginning needs and diseases or to prevent them. If this be wise as regards the teeth, how infinitely wiser it would be as regards the kidneys, the eyes, the heart, arteries, etc., and the person as a whole. It is the shame of medicine and the basis of quackery, this symptom-treating and symptom-killing. What a horrible fact—this of the vogue of the pain-deadeners! Millons of dollars are capitalized in the business, and half or three-fourths of the work of our lives is devoted to the mere stopping or deadening of symptoms. But, as we all know, true medicine is to stop the cause of symptoms, to prevent the symptoms from ever arising. For many years, in my specialty, I have been begging that biennial ocular examinations should be made, regardless of "no trouble," regardless of "perfect satisfaction." Absence of symptoms is no evidence whatever of absence of disease. No eye should ever be left over two years without re-examination. No spectacles can remain correct two years, because no eye ever preserves the same refraction, balance, and powers, for that period of time.

And what good also is the enucleated eyeball, or any

piece of dead tissue, in the hands of the pathologist? Certainly only to prevent other living eyes and organs from becoming as these dead ones have. True pathology is surely knowledge of disease in the making. The pathologist's final problem is to prevent pathologic specimens from ever coming into his hands. Quâ pathologist he must commit scientific suicide. Most of our fashionable pathology is the paleontology, not the biology, of disease; but was it not said of old, that it is better to be a living dog than a dead lion? How is disease in the making ever to be discovered except by examinations, continuous observation, of the living supposably-well organism?

Is it not even true of living disease that one-half the patients seen by the doctor are seen far too late? For paresis, locomotor ataxia, etc., and for many psychic diseases we do nothing, because we recognize their existence so late that nothing can be done. Had they been seen earlier injury could have been prevented. Surely in more than 25 per cent. of my patients many years or whole lifetimes of suffering and disease could have been obviated. It is doubtless as true in general medicine. All good medicine inevitably tends to become preventive medicine; all good physicians labor to stop disease before it arrives. The whole ingenuity of the trained diagnostician is now expended on the problem of the earlier symptom. He is the greatest discoverer who finds the presymptom, or the symptom of the symptom; the greatest therapeutist is he who cures before the disease exists, he who starves the bacillus to death, he who stops the evil habit, thus preventing the malfunction that becomes organic disease. The best cat is the one that kills the rat that eats the malt that lies in the house that Jack built. It is a truism that gout exists in the patient's system long before it causes a twinge of pain; the kidneys are ruined before the slightest subjective system is manifest; there may be heart changes indicating the existence of nephritis, which a single uranalysis may not detect; arteriosclerosis may be present prior to subjective symptoms, and the objective examination would detect it; there may be unsuspected diabetes without symptoms until exam-

ination of the urine reveals it—even with our crude prescience early uranalysis of the apparently well would often reveal the hidden evil at work sapping and mining toward the vital centers. Every oculist has often discovered albuminuria before the general physician suspected it. There are a hundred known intimations and auras of oncoming disease, but there are a thousand undiscovered ones, presymptoms, advance scouts and forerunners, to be learned when the slight and unconscious departures from normality are studied by examinations of the supposably well. Pathogenesis, not therapeutics, is the ultimate study of all medicine. And all pathogenesis is by no means running bugs to their holes: the greater number of life-wasting diseases are not bacterial in origin; and even the growth of the bacterial diseases depends on the soil in which they are sown.

I picture to myself a new field of work opening out before the poor plundered general practitioner. It must often seem to him that as a general he has been stripped of both army and enemy. One by one the specialists have robbed him until he has left hardly a soldier or a patient. The surgeon first took almost half of his army, and now threatens to relieve him of Colonels Appendicitis and Typhoid, and heaven knows of how many more officers which he formerly considered his very own. Then the aurist, the oculist, and the rhinologist deprived him of his special senses, and the laryngologist rendered him aphonic. If the obstetrician and gynecologist left him one or two of all his women folk, the rest-cure man and the neurologist soon alienated the affections of these hysterics—and they lived unhappily ever after. The pediatrist stole his babies and the psychiatrist his mind; and, lastly, the gastrologist will not allow him to have all to himself, even a simple stomachache.

The truth seems to be that of all the specialists the generalist has been squeezed into the narrowest specialty, and the surgeon is grasping avidly at his one or two remaining comforts. Even the diseases of the lungs, stomach and kidneys are now claimed and we may soon expect to see such advertisements in the religious and

daily newspapers as: "A new operation for neurasthenia; craniotomy for unselfishness; preventive inoculations in case of threatened breach of promise; vaccinations for antivivisectionists; damaged heart-valves surgically repaired while you wait; kidneys transplanted immediately following the next electrocution; complete maturation of the artificially fertilized ovum in our new twenty-first century incubator."

The family physician's function seems to be fast becoming that of adviser-in-general and referrer-to-others; the "last straw" is that ethics will not permit these others to divide their fees with him. Nothing in fact is left to him except to have permanent anorexia and to move to a climate in which house and clothing are not necessary—Porto Rico and the Philippines, for example—providentially supplied, without doubt, for this and similar tariff purposes.

But seriously, have we not gone too far with our specialism, and are we not thereby in danger of losing the co-ordinating sense and oversight of the organism as a whole? The specialist can not be dispensed with. By his aid and through his accuracy medicine must progress; but neither should the generalist be squeezed aside. He is even more necessary. It is his duty to teach his under-officers, the specialists, their proper places, and by his sane and large grasp of all the facts supplied by these subalterns, by his co-ordination of the work of each and of all with his own overlook of organism and life as a whole, he brings cosmos out of chaos, and organic unity out of hundred-eyed and selfish diversity. The specialist is fatally inclined to treat the disease; to the generalist must be left the far more important treatment of the patient.

It may seem hard and impertinent to say to an audience of generalists that the generalists have been robbed because of their own fault and negligence. The so-called stealings of the specialists are in reality helpful and if rightly understood they leave the generalist his proper work. Life, it has been said, is made up of little things; and yet life itself is not a little thing. So it is with health, fulness of years, and utilization of powers; they all depend, medically and physiologically, upon little things, and yet compositely, they are "the greatest thing

in the world." In the vogue of the specialist, the generalist is more than ever needed. If the aristocrats have usurped power, there is the chance and demand for a powerful king. The specialists are, or may be made, the assistants of the general physician, who needs their help and all the data they can supply, and whose supreme function it is to fuse the whole to a higher unity and to establish the secret relations in reality existing in all. There is no specialist who is not willing and glad to make full and systematic reports to the general physician of all his findings. It is his duty to the patient and it is the specialist's self-interest to do it well. He is not so stupid as to offend the referrer of patients. In this function the generalist has the whip-hand—and he should use it, at times.

And thus it happens that the desirable system of personal biologic tests sketched need not await the action of government, the university department, the city or state institute, the union of anthropologic societies, or the anthropometric and pathologic institution founded by private endowment. Let us earnestly pray and work for any or all these things; but in the meantime much may be done by medical men and societies to prepare for the larger and more perfect outworking of the scheme—nay much may be done toward the realization of its more distinctively medical features.

Based upon the fact actually felt by every physician, that a series of systematized periodic examinations of patients apparently well would often reveal beginning diseases, prevent future illnesses, and increase the vital values of life, every one can prevail upon certain patients, students, or members of his family, to undergo the necessary tests. The more intellectual and well-to-do citizens will soon realize the self-evident value of such work, and not only submit to it for themselves and children, but will be willing to pay an annual fee for the service. Specialists will be willing to contribute their results. The examinations need be only of the more fundamental and simple factors at first until the good-will, machinery, funds, and recognition of the significance and usefulness of the work grow.

In several ways these examinations themselves are the means of a striking self-education of the physician:

1. In systematizing and perfecting a method of rec-