

Biologists in search of material : an interim report on the work of the Pioneer Health Centre, Peckham / [edited by G. Scott Williamson and H. Innes Pearse].

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Publication/Creation

London : Faber and Faber, [1938]

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**BIOLOGISTS
IN SEARCH OF MATERIAL**

*An Interim Report
on the Work of*
**THE PIONEER HEALTH CENTRE
PECKHAM**

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FABER AND FABER LIMITED
24 Russell Square
London

BIOLOGISTS IN SEARCH OF MATERIAL

An Interim Report on the Work of The Pioneer Health Centre, Peckham

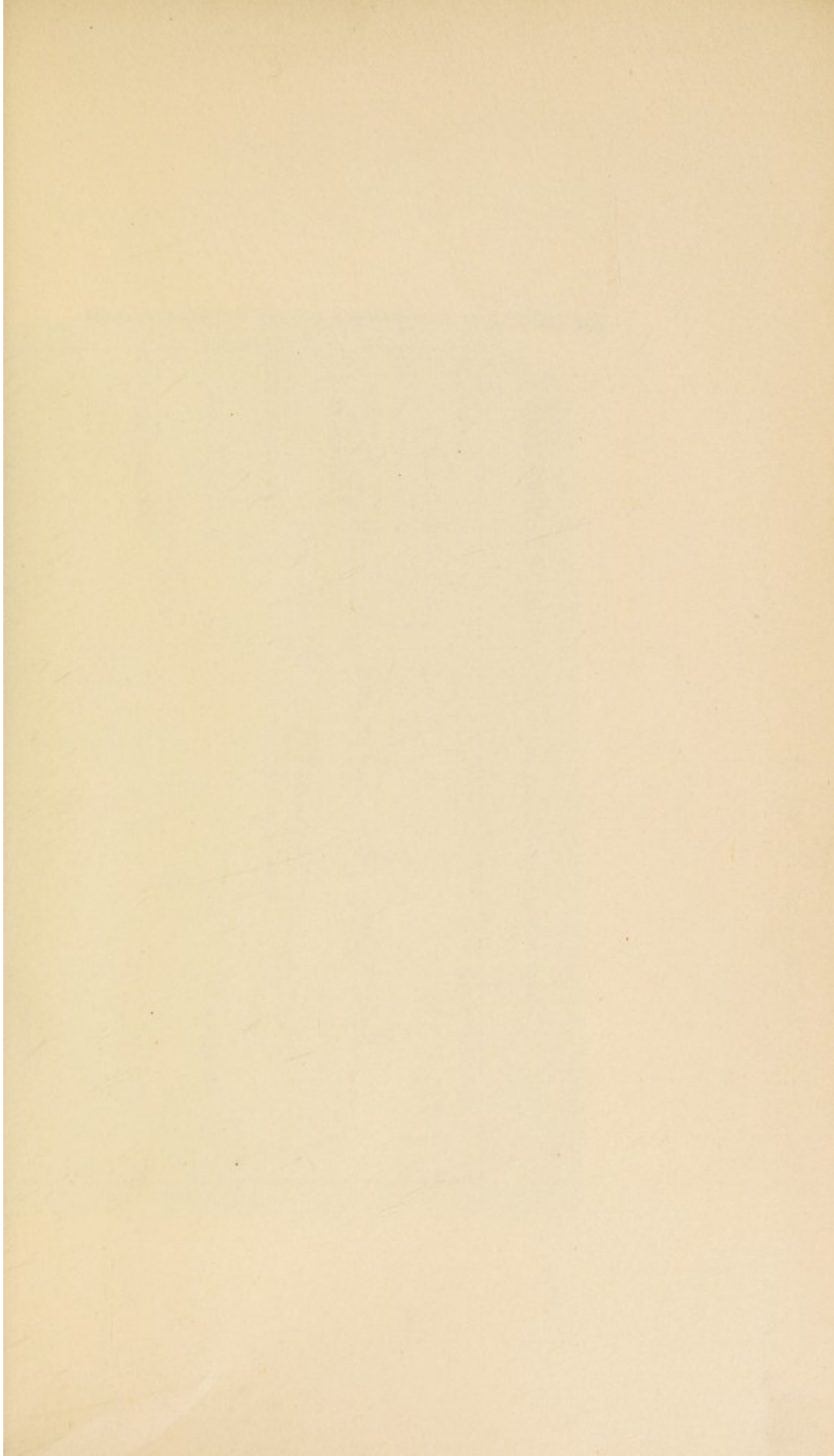
Health and fitness are very much in the public mind just now. The appearance of this report, therefore, is particularly appropriate since it presents us with the results of a unique enquiry into the maintenance and development of health. It is a sequel to *The Case for Action*, which described a remarkable experiment in applied biology.


Here the experiment is carried a stage further and we see the results of the first eighteen months' work in the Pioneer Health Centre at Peckham.

Every year millions of pounds are wasted through illness. Millions more are spent on research into treatment and diagnosis. This knowledge, so expensively acquired, is then distributed among the sick, who are already past any real chance of rehabilitation.

The argument emerging from this Report is that such prodigal expenditure could be checked by regular overhaul and health supervision and the work at the Pioneer Health Centre is the first step to providing such a service throughout the country.

The authors of this report, Dr. Scott-Williamson and Dr. Innes Pearse and their assistants, are primarily concerned with biological research; and their findings provide material of the utmost significance for the medical profession and the general public alike.





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IN SEARCH OF MATERIAL

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**BIOLOGISTS
IN SEARCH OF MATERIAL**

An Interim Report on the Work of
**THE PIONEER HEALTH CENTRE
PECKHAM**

FABER AND FABER LIMITED
24 Russell Square
London

First published in April Mcmxxxviii

By Faber and Faber Limited

24 Russell Square, London, W.C.

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Western Printing Services Ltd., Bristol

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CONTENTS

INTRODUCTION: BIOLOGISTS IN SEARCH OF MATERIAL, by G. Scott Williamson, H. Innes Pearse	page 17
FOREWORD: A LAYMAN'S COMMENTARY by J. G. S. Donaldson	21
THE REPORT	31
I. Collection of material	33
II. Method of examination of material	43
III. Results of examination of material	52
Part I. Objective facts disclosed	53
Part II. Subjective facts disclosed	77
SUMMARY	92
<i>Appendixes</i>	
I. Laboratory schedule	96
II. An illustration of the effects of night-duty	97
III. Conditions of membership and membership fees	98
IV. The Building	99
INDEX	103
Plate I	<i>facing page</i> 96
Plate II	97

CONTENTS

INTRODUCTION: SIGNIFICANCE IN SEARCH OF
MATERIALS by G. S. Wilson, H. J. Lee, J. Lee
page 11

FORWARD: A LAYMAN'S COMMENTARY

by J. C. Gardner page 11

THE REPORT

I. General page 11

A. Objectives of research

B. Method of research page 11

C. Results of research page 11

D. Conclusions page 11

E. Summary page 11

APPENDIX

Appendix

I. Laboratory methods page 11

II. The literature of the subject page 11

III. Conditions of research and organization page 11

IV. The findings page 11

INDEX

Page 11

Page 11

ANALYSIS

SECTION I. COLLECTION OF MATERIAL *page 33*

BASIS OF MEMBERSHIP

- Family membership . . . stretched to include the fiancé(e) . . . material needed to be average not selected . . . this implies a limited district . . . organization must be self-supporting . . . miscalculation over speed of growth . . . two problems: (1) How to make the Centre known in the district; (2) How to keep the members when they have joined. 33-34
1. *Recruiting* 34-37
Circularization . . . appeal must be intensive not extensive . . . more difficult to attract families than individuals . . . lack of adult leisure . . . appeal at its lowest to certain families . . . principal appeal to younger children . . . limits of snowballing through lack of neighbourliness . . . faculty for neighbourliness not lost, however . . . ultimately, Centre depends on good reports from its members.
2. *Continuity of Membership* 37-42
Continuity of membership essential . . . the specialist will stay and put up with anything . . . but he is relatively rare . . . the problem is the man without drive or initiative . . . difficult to attract, difficult to keep . . . yet forms the bulk of the public . . . failure of attempt to interest through emulation . . . resistance to 'authority' . . . presentation of opportunity the only acceptable approach . . . essential for experiment as a whole that

ANALYSIS

methods of collecting material should be free page
from compulsion . . . difficulty of eliminating
influence of the 'observer' . . . anarchy? . . .
emergence of order from spontaneous action
. . . danger of order degenerating into rigid
system . . . voluntary limitation of action
may be symptom of ailing.

SECTION II. METHOD OF EXAMINATION OF MATERIAL 43

Procedure 43-47

Enrolment . . . the examinations . . . other set
consultations . . . pre-marital . . . observation
and service during pregnancy . . . difficulties
in counteracting general atmosphere sur-
rounding this normal function . . . feeding
. . . weaning . . . 'infant welfare' . . . interest
in family rather than infant.

Characteristics of Health Examination . . . 47-51

The aim of the examination . . . extends out-
side consulting-room into social life . . . no
danger of producing health cranks . . . at-
tempt to state facts, not to give advice . . .
responsible family action follows better with
no advice. No criticism of the general prac-
titioner implied . . . the general practitioner's
position contrasted with the Centre's . . . the
general practitioner is aware of his handicaps
but his protests go unheeded.

SECTION III. RESULTS OF EXAMINA- TION OF MATERIAL 52

1. OBJECTIVE FACTS 53-56

Schedule of disorders . . . comments on
schedule . . . no problem of poverty . . . aver-
age wage and occupation.

Major Maladies 56-57

High incidence . . . mostly unsuspected . . .
indicates that national sickness figures are
grossly underestimated . . . importance of
greater *curability* through early discovery of

ANALYSIS

<p>malady . . . lack of urgency due to diagnosis taking place before collapse makes situation much easier for family to handle . . . Centre technique a most efficient net for catching disease early.</p>	<p style="text-align: right;"><i>page</i></p>
<p><i>Minor Maladies</i></p> <p>Proportion to major . . . not unimportant because slight . . . tonsils and adenoids in children . . . flat foot . . . myasthenias following intercurrent infections in childhood . . . 'follow-up' after discharge from hospital . . . importance of regular overhaul . . . compensation.</p>	<p style="text-align: right;">57-60</p>
<p><i>Treatment</i></p> <p>The Centre does not treat, but has to check up on the results of treatment obtained by its members . . . the functions of the general practitioner and the specialist . . . the general practitioner treats social incapacity only, the specialist the 'diagnosis' . . . consequent difficulty of obtaining treatment for members suffering from minor maladies, insufficient to cause social disability . . . the Centre's special research department.</p>	<p style="text-align: right;">60-63</p>
<p><i>Results of Treatment</i></p> <p>Cure of ailment does not produce health.</p>	<p style="text-align: right;">63</p>
<p><i>Devitalization</i></p> <p>'Hypotonia' . . . its characteristics . . . hypothesis concerning blood sugar . . . acute condition of hypotonia compared with chronic . . . incidence after influenza epidemics . . . the hypotonic woman will not welcome pregnancy. Second type of devitalization . . . 'dystrophy' . . . its characteristics . . . need for further research along these lines.</p>	<p style="text-align: right;">63-70</p>
<p><i>Nutrition</i></p> <p>Not a simple problem . . . malnutrition among plenty . . . the study of iron deficiency . . . biological standard adopted . . . numbers deficient on this standard . . . results of treatment . . . causes found . . . worms as cause . . . defi-</p>	<p style="text-align: right;">70-76</p>

ANALYSIS

- ciency can be sustained in spite of rich supply of deficient substance . . . intercurrent fevers as cause . . . operations as cause . . . iron deficiency more amenable to study, but what applies there seems to apply to other deficiencies . . . effective utilization is the key . . . sometimes can be induced by intensive exercise . . . value of free movement . . . danger of overclothing . . . sleep . . . study of nutrition must become study of *biological demand* . . . not merely of supply but of utilization also . . . our ignorance in the matter . . . need for research.
2. SUBJECTIVE FACTS
- Present relationship of doctor to patient . . . 77-78
patient must make first diagnosis . . . importance of bringing patient to doctor earlier . . . the Centre organization is an experiment to try to overcome this fundamental difficulty. Tentative classification of individuals examined into categories.
1. *Disease*. Definitions . . . disease and disorder . . . social incapacity . . . patient considers only disease . . . disorders the doctor's concern . . . members found diseased . . . mostly not under treatment . . . why? . . . reluctance to seek medical aid . . . totally different attitude towards health-doctors at the Centre . . . necessity for continuous observation . . . it is social incapacity alone which brings patient to doctor . . . this is not the doctor's fault . . . research into therapeutics and diagnosis not enough . . . there must be research into how to reach the individual at best moment for application of existing knowledge and skill. 78-83
2. *Well-being*. The numbers found in this category . . . non-complaining, they assert they feel well . . . disorder can occur without disease, not *vice versa* . . . well-being is a subjective state . . . it has varying degrees . . . may be associated with the gravest or most trivial disorders . . . examples . . . manifest 83-89

ANALYSIS

disorders . . . cryptic disorders . . . compensa- tion conceals disorder and permits subjective well-being . . . dangers of compensation . . . after underlying disorder is cured, dehabitua- tion of compensatory mechanism is necessary . . . sub-conscious suffering . . . positive sub- conscious characteristics of well-being . . . value of <i>conscious</i> compensation . . . pregnancy . . . compensation in children . . . can any test for compensation be found? . . . possibility it may affect growth-weight curve . . . need for further research to follow up this suggestion . . . extreme difficulty of bringing people in 'well-being' to the skill of the doctor.	<i>page</i>
3. <i>Health.</i> As yet no criterion . . . 'healthy' those in whom no disorder could be detected . . . numbers in this category . . . hypothetical definition of health . . . opportunity and material now available at the Centre to test this hypothesis.	90
<i>Tentative Conclusions</i>	91
<i>Summary</i> , derived from consideration of the Subjective Facts	92-94
Appendix I. Laboratory schedule	96-97
Appendix II. An illustration of the effects of night-duty	97
Appendix III. Membership conditions and fees	98
Appendix IV. The Building	99

INTRODUCTION

BIOLOGISTS IN SEARCH OF MATERIAL

Many critics—and thus friends—have visited us during the last two years. The visit invariably results in a question to clear up the puzzle presented by a socio-medical institution throbbing with movement and gaiety. ‘What is it that you are after? Why are you doing this?’

Our answers to these questions will not be very apparent in the body of the report. Indeed the substance of the report may give a false impression of what we are trying to do. So an introduction is necessary.

Our first report, *The Case for Action*, was of a very general nature, describing as it did the first phase in an experiment which was to determine if a second phase, on a larger scale, were justifiable and if so what shape and form it should take. From that report it has been assumed that we were recommending a particular type of new social service institute. That is not so. We were and still are pursuing an inquiry, conducting an experiment, seeking facts in a new field—that of applied biology.

The proper title for this interim report then is ‘Biologists in Search of Material’, for that in fact is the primary purpose of the Centre.

What then is biology? We define biology as the study of the physiologically balanced organism with its environment. It is as much a study of the environment as of the animal; indeed to the biologist the two are inseparable. Thus neither the physiological field nor the pathological field is the area of exploration for the biologist, though the principles of both sciences are his only equipment.

INTRODUCTION

Pathology is characterized in its processes by the physical or chemical demarcation of the site of injury from the general body—the creation of a zone of reaction. Similarly any want of balance in the physiology of the organism, or of the environment, leads to the appearance of this demarcation—zone of reaction—between the organism and the environment. Pathology could be described as the study of the mechanism of re-action in the organism *escaping* its experience—assuming the defensive, as it is called.

To the physiologist this tendency to reaction is the experimenter's bugbear, for in all his experiments he has to devise controls or conditions that do not induce reactions to injury. The physiologist is studying some specific effect; one has only to realize the immensity of the effort needed to control, condition, regulate or exclude the general effects of the environment in a physiological experiment, to appreciate the distinction between physiology and biology. A surviving organ like the heart beating in a bottle or the pithed frog is the physiologist's material of election for experiment. Clearly this means that the interpretation of any physiological discovery in the relatively isolated organ or organism will always demand a further study of its application to the organism living its life.

The translation of physiological *action* into biological *function* is not a process the logic of which is yet disclosed. Presented with a basket of threads—every colour guaranteed by the physiologist steadfast and reproducible—we are still a long way from the Persian carpet with its inevitable logic.

On the face of it that might suggest that biology is merely the study of applied physiology. But that is too limited a view, for to apply physiological discovery means conditioning the environment to secure a specific effect, treating the environment as a sort of predetermined storehouse of experience which is there for the organism to draw upon. The consequent emasculation of the organism—i.e. reducing it to the level of a pithed frog or bottled heart—will hardly lead us to the unfolding of the processes of living. The environment must be as free to shape and form itself as the organism it enfolds.

INTRODUCTION

The organism actively embracing the non-conditioned environment, i.e. the organism in health, is thus the biologist's material. It would appear therefore that biology is the antithesis of pathology and that biological science will have physiology and not pathology as the keystone of that bridge to knowledge.

While pathology is the study of the organism on the defensive, or more correctly in escape, running away from *living* so as to ensure *survival*, the biologist's material is the organism actively embracing the environment, i.e. in health.

As an example: the man who wanders in the summer pastures, stirring up and inhaling the cloud of pollen dust, is not missing the effect of pollen on his physiology. He must be looked upon as being in *actional* relation to these salutary substances.

He with hay-fever is in the other category—is in the *re-actional* relation to the pollen. The obviousness of all re-actional states, i.e. of pathological manifestations, has blinded us to the biological significance of most of the actional relations. They tend to be taken for granted.

A further contrast is that the pathological approach to any problem leads only to therapeutics; the end is so clear and obvious that the lure of cure is wellnigh irresistible—in spite of the fact that you cannot make silk purses out of sows' ears or put new wine into old bottles!

The biologist's approach to any problem leads directly to cultivation. This is as yet recognized only in the vegetable and to a lesser extent in the animal fields of experiment, and it is only in recent years that in those fields research workers have thrown off the yoke of the pathological approach. Human biology, whether physical, mental, social or economic, is still exclusively approached from pathological experience—from reaction—through and by cure. That must serve until scientists have explored the biological field.

As biologists then we are engaged in a quest for Health. So far the search has not been productive. Nevertheless, our two years' work has produced something which from the purely scientific point of view may be of value—that is a hypothetical definition of health. Our definition of health reads: 'the physiological condition of an organism living in

INTRODUCTION

mutual synthesis with its environment'. Our attention is thus now focussed on the study of synthesis in the material and physical field. That seems to us a step forward, leading us to development of a new technique for observation, measurement and experiment.

From what is called the practical point of view, this result would hardly seem to justify the outlay of time and money involved. But, having failed to find material ready to hand, we naturally had to turn aside from our main issue, health, and attempt the re-conditioning of the only material available. Thus this report is largely concerned not with our main purpose but with the incidentals to that endeavour—with the sick and their rehabilitation. We believe that this has led to many technical and factual advances of more general value and application.

Thus, as in so many other scientific investigations, it is the incidentals that may prove of the more immediate practical value and more especially perhaps the incidentals of the new technique evolved. Technological advances are so often the first results of any scientific inquiry. It is because of that that science is too often praised or blamed for advances that are merely technological, and the technologist credited with the scientific spirit, so that scientific truth tends to become buried in material values. Our age is talked of as a scientific age, for example, when it is in fact a technological age. Not that there is no virtue in technology, for the true technologist worships efficiency and never rests content until he gets out all he puts into his machine.

The technologist's field up to now has covered only the physical and the material. He cannot go far in human affairs until the scientist has again given him, as well as the technology of the machine itself, knowledge of what to put into the machine and of what to expect out of the machine.

Man's vaunted 'conquest of nature' is the expression of a power complex—vain humbug. Nature is that which we *obey*. The scientist is deciphering the rules we have to obey. Every rule disclosed has had within it its own power to ensure obedience. This might stand for a description of progress or evolution. We must strengthen our humility to hasten the era of a *greater* obedience; for nature keeps no secrets—only we have the blindness of our own complacency.

FOREWORD

A LAYMAN'S COMMENTARY

The scientist is quite happy collecting facts, or what he thinks are facts, and drawing theoretical conclusions from them, which he then enjoys testing by collecting more facts and matching the actual outcome against the theoretical forecast. He is quite unconcerned with whether his findings are used, misused, or neglected. (It is the layman through the scientist, not the scientist through the layman, who has developed the horrors of modern scientific warfare.) The layman's interest, therefore, in this report will not be in its ultimate sublime truth, but in just how much can be got out of it now for him and for society, either on a long view or on a short view. If the doctors had discovered that caviare and old brandy formed the only really suitable diet for the growing child, it would have been a discovery to them of the greatest scientific interest. To the layman it would be simply irrelevant, as, under any economic system you like to postulate, the supplies of caviare and old brandy could never be sufficient to cover the whole population of growing children.

The scientist is also limited by the fact that he feels that he can only act on scientific information. The layman is not so limited. In this report the doctors are most careful to state that the conclusions can only be valid in respect of the small sample of the population actually dealt with, and that the numbers are too small for statistical generalization. But the layman must realize that the findings have a very wide *probable* reference, with certain allowances for different conditions, to the rest of the country.

FOREWORD

The layman, then, is not primarily concerned with the findings of the scientist except in so far as they bear directly upon his own problem of living under 1938 conditions. But nor is he bound to ignore the scientist's findings simply because they are 'statistically non-significant'.

We start with a premiss which few will challenge—that health is one of man's greatest assets. We are concerned, therefore, with how to give our members the opportunity to maintain and develop their health, and how to detect and suppress the first signs of illness. On the first point science is ill-equipped, so that our object there is research. On the second, the diagnosis and treatment of disorder in its early stages, science has a fund of knowledge with little opportunity to apply it. Our object here is to apply what knowledge we have, and to extend it by practice and experience.

1. First, is the long-term research worth doing? Is it worth collecting money so that scientists may try to study health? There could be no point in studying health if it were no more than the absence of disease, as there would be nothing to study. Does the report convince us that there is something positive in health, that there is a quality emergent from the harmonious functioning of the undiseased organism which *can* be studied? Here I think a case has been made which, though unproven, is worth investigation. It is reasonable to believe that health is different from mere absence of disease, and therefore it is reasonable to undertake a study of health. But reasonable is not enough—is it likely to be useful? It is clear from the remarks in Section III that, if the health standard of 100 per cent haemoglobin had not been adopted, the extraordinary prevalence of worms would not have been discovered. So the study of health can have even a clinical value. This is shown again by the very interesting remarks on nutrition. Starvation has been studied and reported upon again and again in the last few years, by governments, by the League of Nations and by private individuals. It is not until nutrition is studied in apparently healthy material that we find the heavy incidence of malnutrition among the well fed, and that we begin

FOREWORD

to realize that the physiological utilization of the food is almost as important as the food itself. This implies that though the supply of a sufficient quantity and quality of food is a necessary factor in the building up of a healthy individual, it is not by itself a sufficient factor.

It is also clear that the general condition described as 'hypotonia' would not have loomed so large had not the angle of the investigation been the health angle. The hypotonic seems to fill exactly the hypothetical position of the man with no trace of disease and yet with no sign of health in him. Study of this hypotonic condition amounts to an indirect study of health itself, and seems an obvious and necessary piece of research. From the immediately practical point of view, too, it seems that it might have a direct bearing upon the problem of the birth rate. As this question is of real importance to-day, it is urgent that anything which even seems to be relevant to it should be followed up closely.

But, particular considerations apart, the study of health is obviously worth pursuing on general grounds. We know nothing whatever about ourselves and our society beyond the fact that an extraordinarily high proportion of people seem unable to adjust themselves to modern conditions of living. There is urgent need for the study of society and society's problems; sociologists are beginning to study these problems and are receiving increasing help and encouragement in their work. But society must be studied not only as an organic unity, but also in its composition. From a biological angle, at any rate, it is composed of families. So that the Centre's study of the family in its environment is one of the studies most essentially needed to-day.

'We are victims of the backwardness of the sciences of life over those of matter. The only possible remedy for this evil is a much more profound knowledge of ourselves. . . . Since the natural conditions of existence have been destroyed by modern civilization, the science of man has become the most necessary of all sciences. . . .

'In order to develop definitive knowledge, experiments on groups of human beings should be started under such conditions that they could be continued by several generations of scientists.'—Alexis Carrel: *Man the Unknown*.

FOREWORD

These words of so distinguished a scientist as Dr. Carrel, together with the findings and hypotheses in the report, should be enough to convince us that the long-term study of health and of the family in its environment is a study which *cannot* be a waste of time, and which on the contrary should have been begun generations ago.

2. Second, has anything of value emerged from the short-term research, the survey of the families that have come up for overhaul? The report tells us that in eighteen months 1,530 people have been examined, excluding babies; in 9% nothing wrong can be found; 8% are diseased and already under treatment; 83% have something the matter and are doing nothing about it. Of this last group, some are aware that something should be done for them, but are not yet sufficiently uncomfortable to take action; the majority are unaware that they are less than perfectly healthy.

The only way of evading the urgency of these figures would be to maintain that the 83% was mostly made up of trifling disorders which were of no importance. It is true that the incidence of serious disorder here is only 1 in 10. (Even this is high for mostly unsuspected and wholly untreated conditions.) But many of the remaining 9 in every 10 conditions are such as are known to grow into serious disorder over a period of years, and at the least to lead to premature social incapacity.

To what extent can these minor maladies be put right? The interesting fact here for the layman is that, on the second overhaul, it is rare to find any minor maladies at all. This is not to say that the individual would be considered healthy; he might have been, for instance, hypotonic, and his hypotonia might be quite unimproved. But the list of things which could and should be put right by the application of existing knowledge will, in 90% of the cases, be found to have been put right. None of these adjustments would have been undertaken at all but for the Centre's regular overhaul. All of them have been effected through the existing services (panel-doctor, hospital, specialist, or in some cases our own research department), or through the home in consultation with the Centre doctor (e.g. questions

FOREWORD

of diet may be solved by the doctor and the wife in conference), or through the facilities for exercise and social activity in the Centre itself (e.g. the many cases of men who are overweight and who put themselves right by regular swimming and a diet). In each case the thing has been dealt with, and would not otherwise have received attention.

Now any good doctor, given reasonable equipment, the leisure to do his work properly, and the opportunity to examine his patients regularly, could detect and remedy a great many of these minor disorders. No unique powers are claimed in this report. But the Centre doctor has three great advantages.

(1) He sees the patient regularly. Ordinarily the sufferer will not approach his doctor until he is suffering from a major rather than from a minor malady.

(2) He has a well-equipped laboratory at his disposal. The average general practitioner is pushed out into the world with nothing but a stethoscope.

(3) He is in a much better position to conduct his overhaul because he sees and knows the whole family.

(All these points are fully discussed in the report, and need no further elaboration here.)

So that the health service at the Centre not only reveals a most disturbing state of affairs, but in a couple of years has at least made a start in remedying it, as far as the material submitted is concerned.

3. *Is the scheme practicable?*

We have to consider whether the organization of the Centre is one which will affect a large enough number of families, and can be run in an economical enough way, to bring it out of the category of caviare and old brandy. We all know that sufficiently lavish spending of money and attention on people may be expected to produce *some* benefit for them, though, as any charitable worker will tell you, the dividend of benefit is apt to be surprisingly small. So we must ask, is the organization of the Centre capable of sufficiently wide application and of sufficiently economical running to make it of more than academic interest?

First, we must consider whether some such organization

FOREWORD

as the Centre is necessary at all for such work, whether, for instance, existing services, such as the Health and Education Services, could not cover the ground equally well. We find that the existing services, however they might be extended and amplified, make no allowance for continuity between doctor and patient. One doctor is present at confinement, another sees the child at the welfare centre, a third inspects him at school, a fourth looks after him at the factory, and if he is laid off work he is treated by his panel doctor, while it is probably a doctor at the hospital who gives him his death certificate. There *can* be no continuity.

People will not submit themselves for overhaul when they think they are well unless it is made very easy for them. They will only go to a doctor who is in some sense their own employee, and it is probably almost essential that he should be housed in a building where they go often for their own recreation.

Much of the remedial work done at the Centre depends directly on the facilities for physical, mental and social activity provided in the building itself. This was abundantly proved at the small experimental Centre where no facilities were provided and where the work was seriously cramped in consequence.

So we must conclude that some such organization as the Centre is essential if the service we are discussing is to be provided.

Secondly, has the organization any value apart from its value as a means of collecting material for the doctors? Even from a social and educational point of view, the Centre is a most important experiment. The free association of families in one building and the provision of opportunity without leadership, particularly among the children, may well combine to form a new approach to social education. One county educational authority has already had the vision to pay the salary of a warden of a community centre, and it is to be hoped that such a wide definition of the word education may be freely adopted in official circles.

But once again, even this aspect has a direct bearing on to-day's problems.

We find in some cases that a child who will neither take

FOREWORD

part in organized gym nor in free gym nor in swimming will change his attitude when his minor maladjustments are disclosed and dealt with (for example, when he is cured of worms). At the moment the Government is spending money providing facilities and training leaders for physical education. The scheme is plainly a good one as far as it goes, but even its most sanguine admirer will not expect it to affect any but that minority already partial to healthy exercise. By all means let us provide facilities for those who want them. But let us not stop there. We must try to find out why so many do *not* want them, if the scheme is to have any national significance whatever. For instance, what about the 83% of our members who have each something which needs adjustment? Are we to push them into the gym and leave them there?

Surely three things are required at the moment, and the Centre supplies them all. First, an inquiry into method. Second, a technique for applying the knowledge we already have. And third, an organization which will bring the people voluntarily to the means of fitness.

Let us pause for one moment to consider finances. The subsidy required in 1937 to run the Centre was £4 15s. per head per annum. This can certainly be reduced, by increased membership, to between £1 and £2, and can probably be wiped out altogether. But even at its present figure it can be seen to be a not unreasonable expenditure. Using the figures in the P.E.P. Health Report, we find that the annual loss through absence from work owing to illness is £100 millions. Add to this the annual cost of treating and maintaining the sick, £175 millions,* and we get a total of £275 millions, or over £6 per head of the population. When we appreciate that spending on prevention and preventive measures amounts yearly only to £13 millions or about 6s. per head, and Government research to no more than £200,000 or just over 1d. per head, we begin to see that our figures of under £5 per head may not be so extravagant.

But is there any chance that the Centre can be made self-supporting? The number of families is increasing steadily,

* Excluding the figures for Workmen's Compensation, mostly due to accidents.

FOREWORD

which means that the net loss per head is decreasing steadily. There is little doubt that it *can* be made self-supporting, given time to grow and develop at its own pace. There is *no* doubt that it should be given the chance to try.

The report amounts, then, to a clear-cut challenge. It reveals a most unsatisfactory state of affairs. It shows how this can be remedied up to the existing limits of medical knowledge, and how, by experience and experiment, these limits can be extended. The Centre should be a permanent research station into the origin and treatment of minor maladies, and at the same time should continue its inquiry into how to develop health and thereby forestall the onset of disorder.

But even this is not all. The Centre is already one form of the long-term experiment which Dr. Carrel asks for in the words quoted above from his book. And from the Centre can be laid down and developed a technique which can be applied elsewhere in the country, *mutatis mutandis*, so that the Centre health service can become an integral part of the national drive for a fitter Britain.

Without becoming rhapsodical, it does seem that the Centre's success would have unusually useful and far-reaching results. Millions of money are wasted annually through illness. Millions are spent each year on research into treatment and diagnosis. This knowledge, so expensively acquired, is then distributed among the sick, who are already past any chance of real rehabilitation. Is it too much to ask that fifty or a hundred thousand be spent a little more carefully? That we try to find a method of distributing the very considerable knowledge we already have, instead of waiting for the socially incapacitated wreck to knock at the doctor's door? It does not take much intelligence to see that money spent on prevention and research is a better investment than money spent on trying to patch up material which is spoilt and which need never have been spoilt. The £5 per head which we are spending must be worth £20 at the other end of the journey.

Summary of Argument

1. The Centre has begun a valuable long-term research

FOREWORD

into health. This research has already produced incidental information bearing on the problems of nutrition and the birth rate, and is collecting and sifting data which may be of the greatest social and medical importance.

2. The Centre has surveyed a small average section of the population, and has disclosed an alarming incidence of unsuspected serious illness, and a still more alarming incidence of unsuspected minor disorders.

3. The Centre has made good headway in getting the major illnesses referred out for treatment, and in finding, from the existing services or from its own facilities, remedies for the minor conditions.

4. 1, 2, and 3 have been made possible by the Centre organization, and could not have been accomplished, it seems, in any other way.

5. The Centre organization, a family health club, seems to have great possibilities in itself of a social and educational kind, quite apart from health considerations.

6. There is every chance that, given time, the service provided by the Centre can be put on a self-supporting basis.

7. The subsidy per head at the moment, when the Centre is at its most expensive and experimental stage, is £4 15s. per head per annum. This must be contrasted with the figure of over £6 per head of the population wasted annually through illness.

The implications

1. The research into health is already sufficiently fruitful to justify the making of further experiments along similar lines, independently and elsewhere.

2. The regular overhaul and health supervision is of such obvious value that some attempt should be made to incorporate it as a service (omitting the research side) in existing community centres, on a voluntary basis. At least no new community centre should be planned without catering for some form or other of this service.

3. This Centre should be used as a training centre for medical and social workers attempting this work.

4. Such questions as nutrition, the birth rate, the campaign for physical fitness, should be approached through a

FOREWORD

study of the normal man in normal surroundings. Action based upon careful research is more likely to be effective than mere *re-action* to popular outcry.

5. Above all, the Centre must be allowed to continue its experiment, and money must be provided to make this possible.

INTERIM REPORT
ON THE WORK OF THE NEW CENTRE
1935-1937

This is a progress report on the work of the Centre, written primarily for those who have given us their support and encouragement. It is not a scientific statement of conclusions, but a presentation of hypothesis, of procedure and of technique, together with an analysis on broad lines of the material which came under review during the first eighteen months. Any conclusions that may be drawn will apply only to the limited populace of the Centre.

Every experiment has its own basic procedure dictated by the material under observation. So it is with this experiment. The basic procedure has three defined steps:

1. To discover the method of collecting, and retaining for observation and study, human material as *families*.
2. To disclose the present condition of that material by systematic overhaul—that is, to sort out the healthy from the unhealthy.
3. To study the physiology of the healthy.

Section I

COLLECTION OF MATERIAL

It should be recalled that our plan, set forth in *The Case for Action*, was to offer to families living within a specified area a health service in the form of a family club, supported on the basis of a weekly subscription per family. The privileges derivable from membership were periodic health overhaul of every individual in the member-family, and use of the club premises and equipment.

Our studies being directed to a biological end—the study of living—we must use ‘the family’ as the unit of reference. The individual is a dissociated entity that cannot perpetuate itself or in other ways fulfil the full cycle of human functions.

Membership of the club must be by family; no detached individual is eligible. There is one seeming exception to this rule which for our purposes is of special importance. This exception is the fiancé(e) of a member of a family. He or she is welcomed as a temporary member, for these members represent pre-parental material, enabling us to study the family from its beginnings in courtship.

The experiment demanded that the material to be observed should be an average specimen of the population and not a selected public representing one industry, one class, one wage level or one field of experience.* Moreover, in order to use the easiest material for a difficult experiment, families under observation had to be above the lower social problem line and below the upper social problem line.

* Such, for example, as the swimmers, amateur actors, footballers or beer drinkers, for whom there are already clubs or associations of clubs—though not sufficient to meet the demand.

COLLECTION OF MATERIAL

It was further necessary to take this cross-section of the general public from a limited district in which families of the kind required were already naturally aggregated. Experience has shown that we have estimated correctly the possibilities of meeting these primary conditions in the district chosen.

Another primary necessity of the second phase of the experiment was to create a self-supporting organization. This required a membership of something between 1,700 and 2,000 families. It was expected that this number would be reached in three years and that the rate of growth would be steady and progressive.

Here we have to record a miscalculation, for after eighteen months' work our rate of growth, though steady and progressive, was 50% below anticipation.

Apart from the problem of recruiting new members, there is also that of maintaining the membership of those families who have joined. Of the 700 families recruited during the first eighteen months, we succeeded in retaining two-thirds. This is not far short of our original calculation. Previous experience had led us to expect a certain loss of some 25%, owing to removals from the district and other natural causes. Our estimate is therefore not grossly out—though all our losses are not due to removals.

This problem of collecting and retaining material of the correct type thus resolves itself into:

1. How to make the Centre known in the prescribed district?
2. How to keep the members when they have joined?

1. *Recruiting*

We ourselves, our critics and visitors, often ask the question 'Why does such an attractive place fail to collect member-families fast enough?'

This is not a problem peculiar to us, or advertising specialists would not abound. We are introducing something new to the public, something unfamiliar, almost foreign to their experience. This breeds caution and hesitancy—if not suspicion.

So we have to adopt the advertising methods of constant

RECRUITING

circularization and other approaches to the families in the district. The response to each circularization—after the first—has been exceedingly small. Many recent recruits had actually visited the Centre and been impressed by it two years ago and are only joining now—for no reason—just first one thing and then another has delayed the moment. Yet another recently joined family who live only two streets away, had heard of the Centre repeatedly for two years, but saw it for the first time when they came in to join; habit took the man and his wife in the opposite direction in all their excursions—to work, play or shopping.

But apart from the common and ordinary difficulties and our own inexperience, we are faced in recruiting with special difficulties inherent in our problem.

(1) We must of necessity work in a limited district, so that our educational efforts must have intensive, as opposed to the usual method of extensive, appeal. We have to fish a local pond and not cast nets into the sea. We have had to refuse a considerable number of families because they do not live in the chosen district.

(2) We are dealing with families and not individuals. We may attract, indeed we know from experience that we do attract individuals by this or that feature of the Centre; but the individual cannot always persuade his or her family to join. Wives are attracted and fail to bring their husbands, who like their firesides and do not like 'mixing'. Children are attracted and fail to bring mother. One member of the family does not like the medical overhaul while the others do not mind or even like it—and so on.

(3) The exigencies of an industrial worker's life in its early phases make little or no allowance for leisure. Young people can no longer learn their job while working—they must supplement that by evening work.

Among adult workers broken time, spread-over hours and overtime allow too few hours for the organization of leisure. Odd hours off tend to be filled with boredom or distractions, not only for the individual but also for his wife and so for the family.

(4) We had overlooked certain facts pertaining to families with only grown-up children, and to established families

COLLECTION OF MATERIAL

without children. A family with only adolescent children is already in the dispersive stage, while a family of mature age without children is no longer actively functioning as a family. The appeal of the Centre, a family organization, to such families is therefore at its lowest. Nor has the Centre's social appeal any strong attraction, because these two categories of families have apparently formed social habits which more or less fill their leisure. It is seemingly wrong to expect that at first contact they could break down their old habits and begin anew in the Centre.

This directly points to what appears to be the principal reason why families join the Centre. The appeal is to the younger children, under sixteen years of age, and through them to the family as a unit. Whole families do not in fact join because they are sick, weak, ailing or diseased. As we might have expected, it is the young who are attracted by the new.

After the initial advertising campaign, we expected to be able to rely largely on the members to recruit new members. But there is a difficulty here. We already knew from the first experiment that friendlessness was one of the social limitations of modern urban life. Member-families could influence their relations, but these might not live in the district and so might not be eligible for membership. To influence neighbours is more difficult.

Members tell us that there is no real neighbourliness. To meet people only on the stairway, in the street, in the shops or at work, is apparently too casual. It produces too little neighbouring—or too much! We have, however, already discovered from experience in the Centre that it is *the conditions* suitable for neighbourliness and *not the faculty* for it that are lost, for our members do make neighbours from among acquaintances made after joining in the life of the Centre. This is not done, however, by promiscuous contact but through the contacts of common interest and action. It is not the Centre itself, as we first anticipated, but the things members do^e in the Centre with others, which bring people together. In fact, skill shared seems to be the fertilizer of neighbourliness. Some public meeting ground with some

CONTINUITY OF MEMBERSHIP

tangible reason or reasons for congregating is essential. Any direct or self-conscious effort at inducing neighbourliness seems to fail, or at any rate has proved a failure in our hands.

Our conclusion therefore is that for the present we must go on making use of the methods of the advertising agent to bring the Centre to the notice of the local public. But we believe that full membership will probably only be reached as a result of the good report of satisfactory members permeating the district through this casual contact, which in itself is so inadequate an agent for propaganda. The problem is an important one for us for there will always be some inevitable loss to be made up.*

2. *Continuity of membership*

Continuity of membership is a fundamental necessity of the experiment. It is not merely a question of keeping the Centre numerically full but of binding the members to the Centre, knitting it into their lives. The Centre has therefore to feed some natural appetite, to fulfil some biological need, and not merely to give its members what they may happen to want at the moment—e.g. some new distraction. How to keep the members must be for us a matter for deep study, for only by securing continuity of membership can suitable material be found for the student of applied human biology.

The families which stay are those that find something active to do. Furthermore it would seem that it is not enough for one individual of the family to find something to do. The family as a whole must actively operate in the life of the Centre. This particular problem of keeping the members thus resolves itself into a study of *leisure occupation*, and, perhaps more important, a study of *family integration* in leisure.

There is no problem in keeping an individual who has become a specialist or gone further and become a professional in—say—swimming. He will put up with everything and make every sacrifice to get his swim. Appealing to a wide enough area, one would easily, with the equipment we have, fill the centre with the specialists and quasi profes-

* For conditions of membership and fees, see Appendix III, p. 100.

COLLECTION OF MATERIAL

sionals (medal or cup hunters). But in any cross-section of the public, or in any given area, this individual is relatively a very rare specimen; he presents no problem beyond that of providing facilities.

Our problem is the 'man in the street'. He is the man without egotistic drive; he is the diffident and the meek. Because he seems to lack initiative he is left to his own resources—of which he seems to have none. To attract him to any organization is difficult enough; to keep him in it is still another problem. But because he forms the bulk of the public he is most worth study, for on him the success of any social organization depends.

The first tentative approach to encouraging the members to do things was based on the common assumption that ordinary people like to emulate their betters; that an exhibition of a high degree of skill, of relative perfection, would stimulate the imitative faculty and lead to like action.* That method of approach we have found useless; the assumption is not borne out by the experiment.

Primarily, individuals are conscious only of their *own* capacity and act accordingly. They may admire, they may even be envious of outside standards, but they do not use them even as stimulants to try out their own capacity. Skill beyond their own capacity tends to frighten, to inhibit rather than to tempt them to emulation. The status 'teacher' tends inevitably to undermine self-confidence.

Our failures during our first eighteen months' work have taught us something very significant. Individuals, from infants to old people, resent or fail to show any interest in anything initially presented to them through discipline, regulation or instruction which is another aspect of authority. (Even the very 'Centre idea' has a certain taint of authority and this is contributing to our slow recruitment.)†

We now proceed by merely providing an environment rich in instruments for action—that is giving a chance to do things. Slowly but surely these chances are seized upon

* Cf. *The Case for Action*, p. 137, where it was wrongly assumed that the exhibition of high skill would stimulate imitation.

† Cf. again the very different picture forecast in *The Case for Action*, pp. 136 sq.

CONTINUITY OF MEMBERSHIP

and used as opportunity for development of inherent capacity. The instruments of action have one common characteristic—*they must speak for themselves*. The voice of the salesman or the teacher frightens the potential users.

How does this fact reflect on organization and the opportunity for experimental observation on this material?

Having provided the members with a chance to do things, we find that we have to leave them to make their own use of them. We have had to learn to sit back and wait for these activities to emerge. Any impatience on our part, translated into help, has strangled their efforts—we have had to cultivate more and more patience in ourselves. The alternative to this cultivation of patience is, of course, obvious—the application of compulsion in one or other of its many forms, perhaps the most tempting of which is persuasion. But having a fundamental interest in the source and origin of spontaneous action—as all biologists must we have had to discard even that instrument for initiating activities. Even temptation, the gentlest form of compulsion, does not work because human beings, even children, recognize carrots for what they ultimately mean; we have at least progressed beyond the donkey!

We do not suggest that communion, teaming, regulation, system, discipline, authority and instruction are not desirable things but neither can we agree that there is anything wrong with those who spurn these things; we are not missionaries seeking to convert people to desirable things, but scientists seeking the truth in the facts.

Civilization hitherto has looked for the orientation of society through an imposed 'system' derived from some extrinsic authority, such as religion, 'cultural' education, or political suasion. The biologist conceives an order emanating from the organism living in poise in its environment. Our necessity, therefore, is to secure the free flow of forces in the environment so that the order inherent in the material we are studying may emerge. Our interest is in that balance of forces which sustains naturally and spontaneously the forms of life we are studying.

The Centre is the first experimental station in human biology. It asks the question—'What circumstances will

COLLECTION OF MATERIAL

sustain human beings in their capacity for full function (i.e. in health); and what orientation will such fully functioning entities give to human living (i.e. to society)?

Clearly then any inquiry into the nature of health in the organism, to which our experiment is directed, demands first and foremost a study of methods, free from compulsion, of collecting human material and retaining it for continuous observation.

It also demands a critical study of the *conditions and controls* which are so fundamental a part of scientific experimentation. The values of variables must be known or conclusions will remain matters of opinion. Dealing with matter or form, as the chemist does, with motion or force as the physicist does, or with isolated organs as the physiologists do, permits of a straightforward technique for conditioning and controlling any experiment. The biologist studying the human organism must deal with *free* agents. Moreover, their freedom is highly susceptible to limitations. This presents us with a seemingly insoluble difficulty, since those limitations come from other free agents and particularly from the observer. Can the scientific method of experiment be applied at all to the study of the human organism? Is it possible to make due and proper allowance for the observer's and the 'free agent's' participation in the experiment?

As one of our colleagues remarked—It seems that a 'sort of anarchy' is the first condition in any experiment in human applied biology. This condition is also that to which our members most readily respond.

To the scientist who must accept this condition for his experiment, the question will be: What is it that makes anarchy possible as a condition? That merely shifts the question from the individual under study as a free agent to the individual-plus-his-self-created-environment as a free agent.

In the Centre the question is often asked by visitors—'Is it the personality of one or other of the staff or the staff as a whole that gives this anarchy a sort of desirable order? Or is it the thing called 'atmosphere' of the Centre, which again may be a compound of the personality of the staff and the

CONTINUITY OF MEMBERSHIP

members themselves? Or again, is it some more fundamental subjective condition inherent in the human organisms (e.g. altruism or its antithesis egoism) which creates this autonomous order and of which the so-called atmosphere is but the objective symbol?

Clearly these are very pertinent questions, the answers to which must come by direct inquiry and experiment. For this seeming anarchy demanded by our members is the operation of something contained in the material and worthy of analysis. Further, any imposed action or activity becomes a study of authority, discipline or instruction and not the study of free agents plus their self-created environment.

The active-passiveness of the observer is not easy to attain without the essential extension of the laboratory scientist's discipline which allows facts to speak for themselves. In human biology the facts are *actions* which seriously complicate the problem but do not put it beyond the possibility of solution.

The biological necessities of the situation then compel us to leave the members to themselves, to initiate their own activities, their own order of things. We have no rules, regulations nor any other restriction of action, except a very fluid time-table. Within eighteen months the seeming chaos and disorder is rapidly developing into something very different. This is apparent even to our visitors, one of whom on leaving described the life in the Centre as being like a stream allowed to form its bed and its banks according to the natural configuration of the land.

So it would seem that a very strict 'anarchy', if we can use that term, will permit the emergence of order through spontaneous action, and so provide a field of observation for the biologist.

To sustain the anarchy as order emerges is more difficult, for the order tends to degenerate by habit into system which is rigid.

There is a further difficulty which arises in connection with the maintenance of spontaneity, this time one emanating from within the individual himself. He tends to bind himself in habits due to the dominance of age. Children tend to seize upon opportunity, adults constrained by habit tend to

COLLECTION OF MATERIAL

reject it. That this necessarily must be so we cannot yet say, for later in the report we shall see that as age advances disorder and disease become unnecessarily prevalent. Limitation of free excursion is a *natural compensatory remedy* resorted to inevitably by the ailing. Until there has been an opportunity of preventing the onset of disease in the ageing, we cannot know whether or not active limitation belongs to 'ageing' as well as to 'disease'. All that we do already know is that spontaneity in action returns with great rapidity to a child who is cured of a disorder, but with far greater difficulty, if at all, to an older person.

Whether we can go further and say that any observed new limitation of action is a sign of sickness is still to be determined definitely, but all our experience points strongly to that conclusion. In the course of our present research the detection of these limitations of action have not yet failed to lead us to discover in the individual some cryptic disorder. The same is generally true of limitation of action of the family organism—there is disease or disorder underlying it. There is a temptation to speculate that this process might be true also of societies and of nations.

Section II

METHOD OF EXAMINATION OF MATERIAL

Our line of procedure

Families living in a circumscribed and specially selected district* are invited to join the Centre. Before proceeding to enrolment the family is interviewed by members of the staff; the intention of the Centre is set simply before them, and they are advised to consider the matter carefully before deciding to join, since the service demands continuity of membership.

After enrolment there is a probationary period to allow all the individuals of the family to complete their examinations. Only after this is full membership granted.

All examinations are made by appointment only. The work begins at 2 p.m. and finishes at 10 p.m., Sundays and Mondays excepted. These provisions are a most essential feature of the service. The worker's leisure time is distributed in an irregular way and may occupy any part of the twenty-four hours. The members' convenience must be consulted. This is in such striking contrast to the hospital and clinical services that it affords a matter for comment on the part of the members. No difficulty whatever has been

* Unless we adhere strictly to the naturally mixed populace of the limited district, we are in immediate danger of being swamped by families and individuals interested only in one or other of the specific activities of the Centre. We would in fact aggregate a series of specialized groups for medical overhaul, for swimming, for dancing, for drama, for gym, music, etc., etc. This complication of the problem would be worse than the complication that has arisen—to wit the natural reluctance of the average ordinary man or woman to venture into something new until the newness is outworn or accepted as inevitable.

METHOD OF EXAMINATION OF MATERIAL

encountered and only in rare instances have appointments been broken without notice or apology.

The family overhaul begins with the father or with any new-born child, after which the other members of the family follow.

The examinations, three in number for each individual, are as follows:

1. An examination in the laboratory according to the attached schedule.* (Even the new-born visit the laboratory as soon as is convenient.) Time is given for these results to be worked out, say forty-eight hours, and a second appointment is made.

2. The physical examination by the doctor in the consulting-room, for which the member strips naked and puts on a specially designed artificial silk garment and flannel over-cover. Men and boys go to the men doctors and women and girls and all children up to five to the women doctors.

3. The 'family consultation'. After each individual has been examined, this consultation is held between the assembled family and the doctors who have examined any of them. This is a new procedure.

We do not propose at this stage to set forth the technique of the family consultation because it is not yet complete and experience is needed in working it out. Indeed it is unlikely that there will ever be a set technique. It is dictated by the size and nature of the family, which may range from the newly wed pair to the elderly couple whose whole family of eight or nine are out in the world. The family consultation is amazingly informative and interesting and is invaluable to the biologist, covering as it may the whole of family life.

There are other set consultations of great interest and value. They are all concerned with the development of the young family.

Pre-marital consultation

First in order comes the 'pre-marital consultation'. When a marriage is imminent between one of our members and a fiancé(e) who has been a temporary member, both are

* See Appendix, I, p. 96.

PARENTAL CONSULTATIONS

entitled to ask for a complete overhaul, after which they are offered jointly a pre-marital consultation. At this the physiological and biological significance of courtship, of marriage and of the home are set out and an opportunity occurs for either party to ask any questions they may wish to, either at the consultation itself or subsequently in an individual talk with either the man or woman doctor. It is here in the first 'family consultation' that we find our most natural and most satisfactory introduction to the young family.

Family consultations with young member-families often lead quite naturally to consultations with the doctors either to announce a conception, to inquire as to the availability of any facts which would indicate the most favourable time for conception, or, in cases where ill health or deficiencies were originally detected, to inquire whether these are now adjusted as far as possible, so that conception can be approached with confidence.

Parental consultations

We regard a pregnancy as a matter that affects the parents equally. After the announcement of conception, we outline for them the actual happenings in the body of the family which follow conception in the woman.

During the course of pregnancy the woman visits the laboratory fortnightly, when her weight, blood pressure, haemoglobin, blood calcium, blood urea, urine and any other special feature indicated in her particular instance are recorded. Every month she visits the doctor (biologist). These visits afford reiterated opportunity for putting her in possession of such facts as the biologist can give about the changes occurring in the family during this time of pregnancy. There is nothing so potent as facts to dissipate fears. It must be remembered that the average prospective mother is unavoidably living in an environment where fear of pregnancy has, by reason of the maternal mortality and morbidity rates of this and other countries, been raised to a maximum. Where her own health would naturally engender courage and confidence, often there is a prospective grandmother who undermines that confidence. As well as this close attendant upon her, there are the neighbours and the

METHOD OF EXAMINATION OF MATERIAL

shopkeepers, often her only acquaintances, and the newspapers—all replete with stories of sensational and calamitous character. Last of all there is the doctor and midwife. They must guard themselves from censure in case of accidents, and what more natural than to use therapeutic skill to a preventive end? From the moment the woman visits them she must 'take reasonable care', she must not engage in violent exercise, and above all, must avoid anything which might tire her. In fact, precaution and 'rest' may turn her into an invalid for the whole course of the pregnancy, so that by the time she reaches the confinement her general tone, muscular, circulatory, etc., is at its lowest, incapable of responding to the call nature makes upon the mother to *deliver herself* of the child.

The biologist conceives of the time of pregnancy as the time of the evolution of maximum potential in the mother and in the 'family'. So that within the Centre, mothers previously healthy anticipate an increase in vigour, strength and enjoyment during that period; they are encouraged to live their lives just as they were lived before conception. In this way it is possible to see an expectant mother swimming in the bath ten days before her confinement. It is equally possible for the casual observer to fail to notice that she is pregnant, because, the general tone being sustained throughout the pregnancy, the infant is carried without embarrassment.*

Following immediately upon the birth of the child, we deal with the physiology of feeding and with the nature of the infant's acquisition of sensory experience and of movement, in a joint consultation with both parents.

Again in a further 'parental consultation' at the approach of weaning, we outline the physiology and the significance

* This is perhaps but a foretaste of what is to come, for it is only very exceptionally that young families healthy throughout join the Centre at the moment when they are about to set out upon parenthood. Physical health in the prospective parents is not enough; psychological poise is no less important. The pair must be living to a considerable degree in reciprocity before parenthood can be approached in this manner. There is little chance that pregnancy can be embraced with the same zest where the pair are ill assorted.

CHARACTERISTICS OF THE HEALTH EXAMINATION

of this process. And so through each important crisis in the family life we bring the parents into contact with such scientific facts as we know and as are likely to be significant to them at each stage.

It will be seen that though the welfare of the infant is prominent in our minds we cannot be said to do 'infant welfare work'. For us the infant is but part of the family, as a bud is part of the tree to which it is functionally linked. We regard the essential function of parenthood as that of weaning the child, stage by stage, from the specific parental environment to the general environment of the outer world. Until this is completed with the final weaning from the nest after adolescence, we find that it is useless, uneconomic as well as unbiological, to attempt to operate upon one portion of the family—the child—without simultaneously implicating the whole family organism in reciprocal function.* We postulated this from biological knowledge and have proved it by experience in family after family that has passed under review during the past eighteen months.

Characteristics of the health examination

The physical examination presents certain features which make it peculiar.

A general overhaul is not an uncommon occurrence in the clinical field and in the insurance field of medical work, from which it might be assumed that the overhaul in the Health Centre represented a technique already established and familiar to the medical profession. Practical experience has taught us that this is not the case, and the reason why is easy to grasp: the approach to the examination is different.

The life-insurance doctor is excluding certain major and minor conditions of a specific nature. The clinician's approach is one that will lead him to a diagnosis and to treatment. Further, both of these approaches are *based on*

* This perhaps is but a fuller expression of the fact—well known to the experienced infant welfare worker—that her work is frustrated again and again by inability to gain continuous contact with the father and to influence the home. Here let us recall the original definition we gave of 'home' as being, not the house or dwelling which the family inhabit, but the 'field of force' created by the family function. (*Cf. The Case for Action*, p. 53.)

METHOD OF EXAMINATION OF MATERIAL

pathology. This last qualification also dominates the attitude of the medical examiners into the various services, Army, Navy and police force. Generally speaking, all these examinations have the sole purpose of directly eliciting symptoms or detecting premonitory signs of disease. The examination at the Centre is directed to another end; it has a biological and physiological basis and is in no wise concerned with therapeutics. *Its aim is to estimate the direction, the degree and the perfection of function of the body in action.*

We have in fact been compelled to work towards a 'health' examination, and the more experience we have gained the more we find it to be the antithesis of a 'disease' examination. Disabilities and disfunctions that do exist are revealed quite incidentally, and irrespective of whether they have a symptomology or not or whether they are amenable to treatment or not.

Social observation

It will be clear that the health examination, or biological overhaul as we prefer to call it, cannot end in the consulting-room. It is continued in observation of each family acting in the social milieu of the Centre. To see individuals at a social gathering, swimming, dancing, skating; at whist or billiards; at dramatic, musical, or other activity, provides us with essential data which serve to modify or enlarge observations made in the consulting-room. It is becoming more and more apparent as we proceed that the ground in which the seeds of disease are sown is that of disfunction and disability, and more and more it appears to us that the causes of these two major disturbances lie in the field of social health—e.g. the gastritis of the transport worker, the neurosis of the isolated newly wed wife, etc.

Apart from the actual procedure, the nature of the psychological contact between the medical staff and the members must be considered, for it gives every procedure a special value. We are not clinicians seeking symptoms in a complaining patient, but biologists seeking evidence of health in an active non-complaining 'man in the street'. To our surprise, though not beyond our expectation, we have

SOCIAL OBSERVATION

found that the great majority of families apprehend, even if they do not comprehend, the value of the difference between these two points of view. This, incidentally, is an answer to those who anticipated that periodic overhaul would create an anxiety neurosis or neurasthenia. The question our members ask us is 'Why can't I do so-and-so since I want to?' which illustrates the direction of their interest.

Another outstanding characteristic of the biological overhaul must be emphasized. The facts elicited and their significance are as far as possible presented to the family in their entirety, in lay terms. *No advice is volunteered.* To the layman this may appear but natural, since no advice is sought; but to anyone trained in the medical profession—that is specifically to give advice—it is a most difficult attitude to achieve. Indeed 'to give advice' seems to be a wellnigh irresistible impulse to most human beings in a situation of authority. We try then not to give advice and to refrain from assuming the authority of special knowledge. As one of the members put it, 'The doctor simply tells you how you stand.' It is thereafter left to their own degree of intelligence to act.

It is an intensely interesting study to watch and note the various actions undertaken (often at considerable sacrifice in some other direction) as the family intelligence is brought to bear on the facts stated to them after examination. It is seldom the individual but nearly always the family as a whole that responds. A technique leading to this result seems to be fundamental, because it gives to the family an opportunity of exercising the responsibility that it so deeply feels. It is difficult to understand, indeed, why a *laissez-faire* attitude to a mouthful of decaying teeth should change as the result of the new circumstances, but it does; or why a complacency to a useless overweight in either a man or a woman should so change—but it does; with results in either instance of marked benefit both to the individual and to the family. It was found in practice that when the examinations were conducted in a spirit which led up to conclusions which were bits of advice, often no action was taken; whereas by leaving it to spontaneity in the individual and to his own sense of

METHOD OF EXAMINATION OF MATERIAL

responsibility, action is taken in the overwhelming majority of cases. This very action represents the exercise of a faculty that has been largely in abeyance. With exercise of a faculty, health develops. The faculty for responsibility is no exception to this rule.

It will be clear from the above that the health overhaul is developing a technique of its own, based on necessity and not upon theory.

A word of warning must be interposed before we proceed to a consideration of results. Since we are studying the material upon which the general practitioner works, our results could easily be misread as a criticism of the general practitioner. This mistake must not arise, though if we ever attempted to write a caption for this review of public sickness, it would read, 'The General Practitioner's Difficulties in dealing with the Sick.'

We feel that the general practitioner equipped as we are and placed in our position could deal adequately with the situation. Let us contrast the Centre and the general practitioner.

<i>The general practitioner</i>	<i>The Centre</i>
Has no time to call his own, and spends a large measure of his valuable time as a mere chauffeur, travelling to his patients.	Has unlimited time to deal with individuals leisurely.
Lives all twenty-four hours at mercy of crisis among his patients.	Is utterly free from the pressing urgencies of crisis.
His equipment <i>of his own</i> is often only the stethoscope.	Is equipped with the hospital apparatus for diagnosis, with laboratory staff and nurse attendants.
Sees only the sick person in pain or discomfort — has therefore no background for his pathology.	Sees all the family and none of them ill, so acquires a physiological background.

THE GENERAL PRACTITIONER

The general practitioner

Is 'called in' to deal with an immediate situation — and generally at the wrong moment for the exercise of his skill.

His allegiance is divided; it is given (1) to his patients as a whole, i.e. to his practice; (2) to his individual patients, i.e. his art; (3) to the Panel Service; (4) to his livelihood and family; generally in that order of importance.

Is the general practitioner aware of his difficulties? We find that in general he is. Did not much of the vaunted Panel Service arise out of the general practitioners' efforts through clubs to relieve the poor of the onus of medical costs in times of illness? Mr. Lloyd George merely consolidated this established practice, which in itself arose out of the older practice where the rich patient paid for the poor patient, which prevailed in a better-ordered society. To-day the doctors are seeking to incorporate all members of the worker's family in the Panel Service, so frequently called a National Service but truly a Class Service and therefore a method of national charity and not of national insurance. Again, doctors are continually at war with the Panel Authority to extend the benefits to the insured to cover all treatment, etc., etc.

As society becomes further and further segregated into wage-level groups following upon the re-housing policy (working-class subsidized level, speculative builder's level, building society level), there occurs a deeper and deeper social immolation of the doctor—he is cut off from his own cultural level. He is sharing the social sufferings of his potential patients. His protests go unheeded.

Thus at no point does the personal efficiency of the practitioner come in question, for he himself is alive to the difficulties that face him.

The Centre

There is no 'situation' to tie our hands. We are not 'called in'.

The Centre owes no allegiance to anyone but to the family member.

Section III

RESULTS OF EXAMINATION OF MATERIAL

We must now turn and look at the results of applying the procedure and technique outlined.

We are dealing here with the first eighteen months' work. In that time the scientific staff have inspected 640 families, of whom 500 have completed their health overhauls.

The facts set forth in this section of the report relate to these 500 families. Each individual of these families, 1,666 individuals in all, has had at least three examinations; those of them who have completed their second routine tests have had six examinations, while many have had considerably more. Perhaps the facility of contact with the medical staff is best appreciated by the fact that during the eighteen months over 10,000 examinations have been made by appointment. Of these, one-third have been laboratory examinations and the remaining two-thirds personal consultations. This number does not include the repeated visits of infants under one year, nor the casual consultations for intercurrent maladies.

The problem we are dealing with has two sides, the objective and the subjective, each with its own particular importance and insistence, so that they must be dealt with separately, although the facts are drawn from the same material.

We will deal with the objective facts first, though they are at the moment less capable of concise and comprehensive statement.

OBJECTIVE FACTS DISCLOSED BY EXAMINATIONS

PART I.—THE OBJECTIVE FACTS DISCLOSED BY THE EXAMINATIONS

The following schedule sets out the variety of conditions found. These various conditions were distributed among 1,505 people out of the total of 1,666 individuals. More than one malady may have been found in any one individual.

SCHEDULE

Adenoids	56	Fibrositis	5
Alcoholism	4	Fibrotic lung	1
Allergy	24	Flat foot	45
Amenorrhoea	1	Gall bladder condition	3
Anaemia (clinical)	13	Gastro-duodenal ulcer	37
Appendicitis	26	Gingivitis	4
Arteriosclerosis	2	Haematuria	2
Asthma	4	Haemorrhoids	72
Atrophic testes	1	Hallux rigidus	16
Avitaminosis (clinical)	106	Hallux valgus	44
Bell's paralysis	2	Hammer toe	16
Boils	10	Heart conditions	62
Bronchiectasis	1	Hernia	12
Bronchitis	48	Hydrocele	4
Bunion	12	Hyperpiesis	36
Cancer	2	Insanity	1
Cervical erosion	44	Iron deficiencies:	
„ fibroid	2	adults	657
„ myoma	1	children	326
Claustrophobia	1	Lipomata	5
Corns	56	Lumbago	8
Cryptorchidism	9	Lymphadenitis	1
Cyst of breast	2	Malaria	1
Cystitis	17	Malnutrition (clinical)	94
Cystocele	11	Mastitis	11
Diabetes (incipient or established)	44	Metrorrhagia	5
Dysmenorrhoea	11	Migraine	7
Dyspareunia	2	Nail defect	12
Ear conditions	68	Neurosis	27
Emphysema	2	Nose conditions	30
Endocrine dystrophy	2	Osteoarthritis	4
Endometritis	2	Osteomata	3
Enuresis	6	Overweight	86
Epilepsy	1	Plantar wart	16
		Pleurisy	6

RESULTS OF EXAMINATION OF MATERIAL

SCHEDULE—*continued*

Pneumonia	5	Skin conditions	30
Pyorrhoea	31	Stomatitis	3
Raynaud's disease	1	Syphilis	2
Rectal abscess	1	Teeth (decayed)	284
„ fistula	1	Throat conditions	10
„ prolapse	1	Tonsils (infected)	114
Renal conditions	57	Thyroid conditions	14
Retroversion	22	Varicocele	3
Rickets	74	Varicose veins	62
Sciatica	5	Vertigo	2
Sinusitis	6	Visceroptosis	16

Eye conditions are not included.

No effort was made to establish a differential diagnosis. The general symptoms were sufficient to cause us to refer the case for differential diagnosis and treatment.

The list is by no means comprehensive or complete. The approach to a full and complete examination of all individuals is not easy at the first encounter. This is particularly the case with women, so that we may presume that various maladies peculiar to women are understated.

It might be said that, since our approach was that of the biologist rather than of the clinician, the standards used were unrelated to the problems of medical science and procedure, and from the practical point of view fastidious. Our answer to this is twofold. First that biology is concerned with the function of the living organism and that any deviation from function that is observable is worthy of note. Second, that in this survey we have dealt only with those conditions which are universally recognized as clinical entities. Symptoms such as 'constipation', headaches, 'rheumatism', or the milder forms of dysmenorrhoea, our knowledge of which depended only on the testimony of the member, have not been included in the list. Again conditions such as the milder catarrhs, bronchitis, sinusitis, vaginitis, etc., though accompanied by some visible manifestation, have been excluded unless they have appeared as part of the symptom-complex of some more defined underlying clinical state.

OBJECTIVE FACTS DISCLOSED BY EXAMINATIONS

Moreover, it must be noted that where an appendix has been removed, a hernia repaired, teeth stopped, etc., the repaired lesion does not appear in the schedule. Neither is any mention made of the many and various psychological conditions or social maladjustments, many of which were in serious need of treatment.

The schedule of diseases given here is thus to be read in the straightforward clinical sense. It represents active or progressive lesions of one kind or another, of a definite clinical nature. It is not a list of biological shortcomings measured by any theoretical standard.

Faced with so formidable a list we might suppose that we were dealing with the maladies of poverty and privation—but that is not so. Our families are well above the poverty line; they do not suffer from shortage of food, heat, light or housing. They are not a sheltered group of workers but a sturdy group that have succeeded in keeping themselves in as fit a state as is possible in the face of present social conditions. The wage levels vary from the lowest of £2 5s. to £10 or more a week, with the general level at or about £3 10s. per family. (The average size of the families is 3·3 persons.*) Furthermore, clever management seemingly makes the £2 5s., or lowest wage, a sufficient minimal amount for food, heat and shelter.

The following analysis of these 500 families shows the nature of their occupations with reference to the degree of financial anxiety:

In <i>permanent</i> employment (municipal and civil servants of the lower grades, busmen, tradesmen and employers of labour)	201
In <i>regular</i> employment, which may be intermittent but also involves overtime pay (e.g. the craftsman attached to a large firm)	240
In <i>casual</i> employment (often regularly seasonal)	37
Small pensioners	22

* The actual size may be larger, as there may be adolescent or adult children who live at home but do not take up their right to join with their family.

RESULTS OF EXAMINATION OF MATERIAL

We have no problem of starvation or under-nourishment by irregular employment. Our findings are not affected by any lack of the so-called primary necessities for survival. But, as we shall see, the primary necessities for health are apparently not present even in this community.

Major maladies

Turning to a more detailed examination of the list of maladies, we find among them:

- 62 cases of heart disorder, of which only 4 were attending the doctor.
- 57 cases of kidney disorder, 9 only attending the doctor.
- 16 cases of uncomplicated serious high blood pressure, some of them attending the doctor for headaches.
- 44 cases of disorders of carbohydrate metabolism (incipient or established diabetes) only one attending the doctor.
- 17 cases of cystitis, 7 unsuspected.
- 26 cases of appendicitis, of which only 5 were acute or obvious.
- 37 cases of gastric ulcer.

These examples taken from the list are all serious major conditions. Some of them were under treatment when we encountered them, but the majority were either unsuspected or else known to be present but untreated.

The high incidence of maladies of this degree of seriousness in an unselected group of people supposed to be 'healthy' confirms our previous findings from 1926 to 1929 in the first Centre—that there are many more people with untreated serious maladies waiting for crisis or collapse before they will seek treatment than can be gathered from inspection of the official, hospital and panel statistics from which the presence of disease in the country is adjudged.

The importance of this fact cannot be emphasized too strongly. The people who have these maladies are, from the point of view of the medical profession, more worth while treating in an early stage than they will be when they do finally break down. They are in a more curable stage of their malady and they have not yet acquired the subsidiary habits incidental to their disabilities.

Though the conditions are major ones, in dealing with them in the Centre there is no urgency, so that treatment

MINOR MALADIES

can be obtained under the best rather than under the worst possible conditions. If a troublesome appendix is to come out, a holiday or a slack time in the man or woman's job can be selected for operation. No people are more skilful in planning their incomes to meet a known future demand than those who form the bulk of the Centre's members. Given time they will find the ways and means to achieve what is necessary, though an emergency might easily overwhelm them and with them their whole family, creating out of a bad personal situation an even worse family disaster.

In a very large number of cases, judging from their own statements and the medical history, these major maladies had been present for some considerable time and were, from the robustness of the people suffering from them, likely to have continued an equally long time before the inevitable breakdown. During this time the industrial, family and personal capacity of the individual is being slowly but inevitably diminished. It is the waste and missed opportunity implied in this interval that we wish to emphasize here.

From the point of view of medical research in general, eighteen months' work has proved conclusively that a Club such as the Centre, designed for the purposes of health, incidentally operates as a most efficient net to catch sickness early and to bring it into contact with medical skill easily, naturally and voluntarily, and without risk of inducing a neurotic tendency in the individuals surveyed.

Minor maladies

Roughly calculated and naturally depending very much upon individual opinion, the relation of what are clinically called major maladies to minor in the list given is about 1 : 10. On first sight, therefore, it might seem that undue emphasis had been laid upon the high incidence of pathological states, since the greater number were not what is usually regarded as 'serious'.

Our point, of course, is that every little thing that goes wrong is serious. Anyone needing proof of this could find it abundantly in the testimony of the members of the Centre. They know how important the little things are because they

RESULTS OF EXAMINATION OF MATERIAL

have experienced the relief that follows removal. Having a corn removed before it becomes consciously painful soon convinces the individual that pain can be subconscious, and while still subconscious very limiting and disabling. The cure of a symptomless unsuspected anaemia in a housewife makes all the difference not only to the tired woman herself but to her whole family. The welcome she gives, the food she serves, the quality of her actions in the home, and her own happiness, all change completely.

Another example is the enlargement of tonsils and adenoids of childhood. The importance of this particular minor condition is very thoroughly understood by the public and the medical profession alike, because of the surgical procedure necessary to remove these hypertrophied glands. The consequence of leaving them untreated is also well known. Enlarged tonsils and adenoids are very largely responsible for the high incidence of disfiguring septic glands of the neck, of acute middle-ear disease, acute mastoid disease, as well as of acute chest infections. In the Centre we have been able by the continuous inspection of our children to detect this condition at its onset, and at this early stage to arrest or to abate the swellings by strict attention to diet, and to frequency and variety of exercise. This has of course only been possible because of the facilities at our disposal—the bath, the gymnasium, playgrounds, etc., and, it must not be forgotten, by our close contact with the parents, who after family consultation are usually anxious to give their co-operation in matters of diet and in the release of the child for free and spontaneous activity.

A more dramatic illustration of the importance of the recognition of the minor malady lies in the case of the child who, before an attack of scarlet fever, was one of the liveliest patrons of the swimming-bath and the gymnasium. On his return from the fever hospital, cured of his disease and in seeming physiological efficiency, it was noticed that he retired from all his physical activities, isolated himself and became a lone, somewhat morose individual. A careful physical re-examination was at once made. The only condition found was that one of his feet was flat and in use painful. On being provided with treatment for this condition he

MINOR MALADIES

immediately began to resume his activities in the gymnasium, and after a few weeks, when re-education of his foot muscles was completed, he became the same active eager child as before.

These curious, localized myasthenias affect all parts of the body. We suspect many cases of squint and other defects of vision to be of this nature, for they certainly follow upon infectious fevers and other acute debilitating maladies in childhood. But it is difficult to verify their aetiology owing to the lapse of time between cure of the major disease and its delayed sequelae. During this intervening period the child has no reason to be under medical supervision, so that detection of sequelae is left in the hands of the untrained parent. The doctor who may eventually be called to treat the sequel can but *guess* at the sequence of events from analysis of the past history of the case. The Centre organization permits us to observe the individual critically from the moment of discharge from hospital, when in the natural course of events he comes to us for health overhaul after recovery from illness. Thus a wide and prolific field of research opens up in the study of the effect of intercurrent acute minor maladies on the general physiology and indeed on the 'psychology' of children.

The minor maladies then cannot be dismissed lightly. Frequently their consequences, given time or stress, are as serious as the more immediately critical conditions for which so much provision is made.

The human body is like a machine in certain respects; any loose bolt, any want of alinement, leads to want of balance so that the whole engine shakes, trembles or vibrates on its bed and sooner or later this culminates in breakdown. Why then do we not, as some transport companies do with each vehicle as it comes off the road from its day's run, make regular inspections to see if anything is out of alinement or in want of repair?

Expense may seem to make this out of the question, but there is a more subtle reason for the neglect of rational action. The human machine is not in fact the same as the material machine. The body has within it the vital power of compensation for injury and wear and tear. But, as we shall

RESULTS OF EXAMINATION OF MATERIAL

see in another section of this report, compensation is a dangerous mechanism if used other than temporarily, because it masks the wear and tear and injury and postpones the moment when the necessity for doing something about it becomes apparent. In ignorance we go on grinding our bearings because in the living body there is a self-contained cooling mechanism which takes up the heat, and an elasticity mechanism which takes up the expansion, so that it neither burns out nor seizes until the special machinery of compensation itself is worn out.

In the past, when the hope of cure was scanty, the physician's main preoccupation became the relief of suffering and the warding off of death. For him, therefore, the use of the body's power to compensate was the most valuable of all manipulative measures. For the modern medical scientist whose hope is cure and eradication of the cause of illness, the concealment of its initial forms by compensation must be his greatest dread. It is only by the diagnostician being in a position to observe and make records of the individual continuously and in health that the important first departures from health can be detected. There is as yet no organization but the Centre where the conditions exist to make this a possibility.

The Centre is, thus, a unique field of research into the causation of disease.

Treatment

The Centre organization is a net to catch all maladies in its mesh. The question at once arises—Is this worth while? Can anything be done for the maladies when once they are disclosed?

On the face of it the answer would seem to be an unqualified Yes, but in fact our experience demonstrates that the issue is not so simple.

In the ordinary way a crisis decides for the sufferer when he shall seek treatment; but our members become aware of their disorders before any crisis is reached. The first question, therefore, that arises is the psychological one of how treatment is to become desirable to them. This subject, so important to the patient, to the physician and to the administra-

TREATMENT

tor, is dealt with as a separate issue in a later section of this report.*

But after surmounting this initial difficulty there still remain a number of other personal difficulties in the way of treatment for the sufferer. The member, now a potential patient, has to be considered in relation to his work, time, money and convenience.

The Centre undertakes no treatment. It has therefore to secure treatment from the existing sources. Further, it has, because of its peculiar relation to the potential patient, to check up on the efficacy of that treatment. In this way we are placed in a very delicate position, because when one service fails we have to turn to another service, until treatment, if it can be so, is efficacious. We can know nothing of the actual treatment provided by the outside sources and are thereby fortunately not in a position to criticize it; but we are in the position of having to check up on the results.

A curious fact emerges from our experience. The general practitioner services and the out-patient services of hospitals and dispensaries treat the maladies so as to relieve the immediate social inconvenience, pain and discomfort, etc., of the malady. There are of course occasions when this also means the cure of the malady—but in general it is some symptomological aspect of the malady alone that receives treatment from these sources. Sooner or later a major crisis may force the use of the specialist services. The specialist, we find, swings to another extreme and tends only to give attention to the malady, as though it were a pure detached objective thing. Even symptomology in its full significance is neglected—it is the diagnosis, right or wrong, that is treated rather than the symptom.

Thus between the dilemma—symptom : malady—the patient usually escapes attention, sitting as he does between the horns.

It is curious to discover that there is this divergent action between the two forms of service available to the public. But on consideration it becomes obvious that it must be so, for the specialist has made an almost complete corner in the available instruments of diagnosis and treatment, leaving

* Cf. this Report, pp. 77-83, 89.

RESULTS OF EXAMINATION OF MATERIAL

the general practitioner wholly unequipped.* Deprived thus of the possibilities of scientific diagnosis the practitioner has become a most highly skilled craftsman in the relief of the social disabilities associated with disease—*which is what his patients demand of him.*

But it is very clear that what the public demands and gets from the practitioner is not what the State, the friendly societies and the industrialists expect of the doctor.

The medical student secures his qualifications and training from specialists, for specialism; is driven into practice after failing to find something better; attempts in general practice to live up to his high training; suffers his disillusionment; which is retrieved if he discovers this new and unexpected outlet for his energies—*the maintenance of social capacity.* It seems to take some years before the practitioner rises above the training in specialism which he was given as a student and acquires this new attitude towards disease. The patients are so well aware of this doctors' dilemma, that all too often they use their 'panel' doctor, their 'private' doctor or the hospital simultaneously to secure relief from the different aspects of their disabilities.

The patients themselves, we find, are also growing wise to the fact that the equipment for scientific diagnosis and treatment is the monopoly of the hospitals. They tend to go direct to the out-patient department when a diagnosis is obvious to themselves. This will ultimately—the grumble has been expressed to us—force the municipal and county hospitals to open out-patient departments. Before this actually happens would it not be wiser to find a means of providing the practitioner with the instruments of diagnosis and treatment which he was trained to use, for there is no doubt that out of the circumstances of a general practice the doctor acquires a knowledge of his patient unattainable by the specialist and this wisdom the public can ill afford to lose?

In the face of these facts we have had the greatest difficulty in securing efficient treatment for minor maladies and for some major maladies that did not possess the stigma of

* Here and there, maybe, the specialist has placed laboratory results—but not the laboratory—at the disposal of the general practitioner.

THE EFFECT OF TREATMENT

social disability. So much have we been hampered in this direction that we have been forced to open a special research department to deal with the problem. This has become a great burden on our resources of time and money. Although unforeseen, it was an inevitable development.

Any treatment given in the Centre is (1) to those who cannot get it elsewhere, (2) to those who, having been 'cured', are still left with some condition that is not yet recognized as requiring treatment, or (3) to those whose need for it can only be disclosed by the Centre technique. We are not, therefore, encroaching on medical practice, but rendering to our members an auxiliary service not yet to be had elsewhere.

By the use, then, of the hospital services, the general practitioner and our own special department, we have secured treatment for the majority of the diagnosed conditions.

The effect of treatment

What, we must ask, has been the result of this treatment? The course of many maladies has been arrested with success and with satisfaction to the sufferer. But has this been followed in all cases by a great rebound towards health? In a large number of instances, no. No, in spite of the fact that the moment of removal of the disability coincided with new opportunities for expansion represented by the life of the Centre itself. Curing major or minor maladies did not always give health. Too many individuals remained devitalized.

How then is it that biological efficiency did not immediately return when the malady, the presumptive cause of inefficiency, was removed? Was it due to some underlying diathesis or constitution? Or was it that the pathological process, by scar-formation for example, material or psychological, had left the machine permanently lame—devitalized?

Devitalization

Two years' work on diagnosis and treatment of minor maladies has taught us much and has, perhaps, given us a direct lead to further research into these problems.

Two conditions have already emerged as entities from the undifferentiated mass of 'devitalization' among the indivi-

RESULTS OF EXAMINATION OF MATERIAL

duals examined. It is not possible to say whether the conditions themselves constitute the soil (the diathesis) in which maladies can flourish, or whether it is the maladies themselves which determine the subsequent condition of the soil. It will only be possible to answer this question when we are better able to detect these maladies at an early stage, when in fact we have had enough healthy subjects under continual survey for a long enough period.

The first and most definite of the two types of general devitalization we will call 'Hypotonia'.

Hypotonia. This is a fairly clear-cut condition, whether complicated by minor maladies or seen without obvious maladies.

When hypotonia is uncomplicated by any malady, or when the maladies accompanying it have been cured, certain characteristic features present themselves. It must be noted that none of these characteristic features are subjective facts; all are objective demonstrable features. Where the feature has a social aspect, this has been demonstrated in the individual's action as he moves in the club; where psychological it has been observable in the personal and family as well as social reactions of the individual.

These features of hypotonia are:

1. Ineffective muscular tone.
2. Low respiratory capacity, embarrassed but not increased by effort.
3. Low blood pressure (so low occasionally as to be hardly measurable on our instrument—this in a person who looks healthy).
4. Slow, low pulse impulse, embarrassed but not improved by effort.
5. Height—weight relation at par.
6. Low blood sugar values.
7. Chronic constipation.
8. Social inertia (personal, family and public).
9. Psychological somnolence (in individuals of different psychological types) deepened not awakened by stimulus—even sexual.

DEVITALIZATION

Even the major stimulus of pregnancy does not stir these individuals. Indeed, on the contrary, pregnancy may induce immediate malaise which the individual usually accepts without comment and may even take pains to disguise.

Hypotonia is more common in women, particularly in married women, than in men. The explanation of this sex incidence will have to be sought, just as we must seek for an explanation of why gastric ulcer is common among our adult men and rare among our women. The relative sex incidence of conditions often affords a clue to their cause. It might suggest, for example, in the case of hypotonia a special social cause, i.e. the nature of women's work and activities in modern urban conditions.

At first sight the low blood sugar values might suggest a nutritional disturbance or cause—but carbohydrate tolerance is not impaired and there is no reason to suppose that carbohydrate ingestion is abnormal. From our experience in other directions with blood sugar values, we tentatively attach to it a different importance. The low value may prove to be but another evidence of the delicate compensatory mechanism of the body.

Blood sugar could be, as it were, the petrol supply of the engine. In hypotonia it is set low and *resists raising*. It matches the low tone of the musculature and the mind. It could be a sort of automatic governor of an engine whose piston rings and bearings can only bear the strain of a very low load. Thus hypotonics seldom feel tired because, usually subconsciously, they avoid effort, or because they carry out what they have to do with the maximum economy of effort. Their nourishment is adequate to sustain their body form; their work capacity therefore belies their looks. They are not lazy, as is too often supposed; their physiological engine is subconsciously, and perhaps through its sugar pressure, rejecting more effort than it can accomplish. If they are not harried they can still accomplish much—as housewives, for example, they often do.

Perhaps the best proof that this is not necessarily an inherited diathesis is the fact that this condition of hypotonia can be acquired as an acute condition. In the acute condition the picture set out above is reproduced in forty-

RESULTS OF EXAMINATION OF MATERIAL

eight hours, with only one difference, and that a subjective one—the acute sufferer, unlike the chronic sufferer, is to varying degrees conscious of his new state.

In healthy robust individuals of both sexes, i.e. normal in every way we have measured, acute hypotonia can occur as the result of night duty. Day sleep, even ten hours or more, is apparently an ineffective physiological process. It was observation of the acute form in men constantly changing over to periods of night duty that led us to the recognition of the chronic state. We imagined at first that hypotonia was due to fatigue—but we have other men and women in fatiguing occupations and they do not show this effect (indeed almost the reverse) at the end of a long day's and week's work. Fatigue then, acute or chronic, can be eliminated as a basic cause of this state of hypotonia.

We have many charts showing this peculiar and unsuspected result of night work with day sleep, in which efficiency falls to a very low level. This cause and effect is in itself well worth direct experimental investigation.*

Another instance of acute onset of hypotonia (but here complicated by other factors) arose as the result of influenza (?) during the mild epidemic in December 1936. We have a complete record of some twenty cases in men whose previous condition was known.

The hypotonia following this outbreak, presumed to be influenza, was complicated by a fall in the leucocytes, down to 3,000 or 4,000, i.e. to less than half the normal existing before the attack. All this occurred in some cases in forty-eight to fifty-six hours. This striking leucopenia may prove to be a valuable clinical means of identifying certain epidemic attacks, for it does not occur in catarrhal colds. It would be worth determining whether it is a constant feature of all epidemics due for instance to the recently described virus of influenza.

But at the moment the point of interest is that the toxaemia of a particular infection (? influenza) can induce hypotonia in its acute form, thus confirming our conclusion that the chronic form is a specific state of considerable importance.

* See illustration in Appendix II.

DEVITALIZATION

In some acute forms recovery is possible, for a healthy man changing from (night duty—day sleep) to (day duty—night sleep) can recover within forty-eight hours.

In the cases of influenza (?) the hypotonia did not disappear until the leucopenia and erythropenia and iron deficiency were made up. Without treatment in several cases under observation the hypotonia persisted for three months. We have no means of knowing how long in these cases it would have lasted without interference.

The chronic hypotonia, on the other hand, does not respond to any treatment yet discovered. The subject is being investigated.

It is clear from a consideration of this condition of hypotonia that it could be due to some previous affliction which has disappeared or been cured, but which left behind it a general state of physiological insufficiency. If this is so it is another practical demonstration that the patient is more important than the malady; but, as we have already seen, with the intense growth of specialization and the discovery of specific cures, the malady tends to get more and more attention, to the exclusion of the patient. Some of the hypotonics and all the influenza patients, for example, had been 'cured' and signed off as fit to work in this state of *gross physiological insufficiency*.

A woman with a hypotonia who can hardly get through her housework, simple as that can be in these days, is in no fit state to initiate a pregnancy. Nor does she want to. She resists functioning in this major direction, for she does not want to function in any direction—even the simplest social one. Can this be one of the causes of a falling birth rate?

A second type of devitalization. We have given the name 'hypotonia' to a condition in which the body turnover seems to be set at a low level. There are other states where the ultimate efficiency is impaired not by the general level being low but rather by the interruption of vigorous response: like a motor-engine with a piece of grit in the feed-pipe, or a throttle that tends to stick, a clutch that slips at speed. The power is there but its flow suffers interruptions

RESULTS OF EXAMINATION OF MATERIAL

owing to one or other 'fault', so that the attempt to attain maximum function is followed by a rapid fall in capacity.

Like the hypotonic variety these individuals seem to be living without reserves, but whereas in the hypotonics all reserves seem low, in the other type it would seem that one or other *specific* reserve is depleted.

In this type of devitalization we find that detectable nutritional deficiencies of one or another sort present themselves with great frequency as associated maladies. We are inclined, therefore, to describe this state as a *dys-trophy*—tentatively and for the convenience of the moment. Further research into the nature of the condition may alter that view.

The characteristics of this dystrophy are not as clear cut, except by contrast, as those of hypotonia. They are, however, objective features, not subjective ones, and capable therefore of graphic record.

They are:

1. Muscular tone is eager but only temporarily effective.
2. Respiratory capacity eagerly increased by effort, but is soon embarrassed.
3. Blood pressure normal but readily falls and rises.
4. Pulse impulse sharp with systolic and diastolic equal. Embarrassed on exertion.
5. Nourishment exaggerated, e.g., too thin, too fat.
6. Blood sugar tends to low normal values, but is readily variable.

Almost any stimulus excites the subject and a major physiological stimulus like pregnancy induces a temporary exaltation, only to fade out in malaise. We have no explanation to offer for this eager approach to effort. We would emphasize the fact that, as with hypotonia, very varying psychological types are encountered in this group, so that it is premature to attempt to seek some psychological characteristic as a diagnostic feature until the physical type has been studied in sufficient numbers.

Dystrophy is frequent in children and commoner in men than in women. It seems to represent a general state of devitalization of a specific nature, having as its cause many and diverse disorders.

As with hypotonia, we found dystrophy only very rarely

DEVITALIZATION

as a pure condition. Usually it is found with some minor malady, which when cured may still leave dystrophy behind it. Furthermore, like the hypotonia, it occurs as an acute condition following upon some febrile states (infectious and otherwise) or upon major or minor operations, in individuals who were in no such state before the strain.

We have found that the infectious fevers and acute infections generally are a great source of acute dystrophy. Children returned to school from hospital are now immediately put through our routine examination, and in all too many cases dystrophy is revealed, indeed we might say that it is the rule after illness. Sometimes it is coupled with a recognizable deficiency, as for example of iron or of erythrocytes.

In some cases a specific deficiency, iron for example, resisted correction and the dystrophy persisted until dealt with by vitamin feeding as well as by iron. Yet in other cases, the iron reached normal but the persistence of the dystrophy suggested other deficiencies. Thus by taking the dystrophy, ill defined as it may be, as a general guide, we have been able to guess at the existence of cryptic deficiencies following fevers; and further to determine that shock tactics are needed, since the enriched diet of convalescence—milk, eggs, etc.—is not sufficient to initiate the return to a balanced state of nutrition. Yet in these same children, before the fever, ordinary diet had successfully maintained nutrition.

There are but few means of checking up on specific deficiencies until they produce the florid signs of a known malady. Whether or not the recognition of this general condition of dystrophy will afford a broader basis for the recognition of the existence of specific deficiencies or not remains to be seen. It affords one more piece of very necessary research in the problem of nutrition.

Enough has been said to indicate the value of this line of research into the biological state of individuals following upon the study of minor maladies.

From what has been said of these two general states it is clear that only intensive close study of each individual can reveal the full effects of maladies and intercurrent infections and affections on the general physiology. The cure of mani-

RESULTS OF EXAMINATION OF MATERIAL

fest maladies, while relieving suffering and lengthening survival, can have only a minor effect on the *health* of the people. To keep a machine in running order without reference to its efficiency is a very paltry economy, in the case of the organism ultimately reflected as waste in the next generation, for the inefficient machine is reproducing its like.

Nutrition

We must now turn to look at the state of nutrition that we have met with in our member-families.

We are in a fortunate position. The Centre families have no shortage of food and are in contact with exceptionally good and cheap markets, so that we must presume that there is no lack of variety in their available food supply. Thus if nutrition were the simple problem it is at the moment assumed to be in the Press—namely a problem of sufficient supply of available foods—there should be no malnutrition in our members.

Malnutrition of plenty—it reads like a contradiction! Yet in our populace we have had to deal with a considerable incidence of malnutrition, and even with severe asthenia.

From this it appears that the problem of nutrition cannot be solved by restricting our attention to the quantity of food, i.e. the calorie values; nor indeed, as we shall see later, to the quality of the food, i.e. the vital values.

An abundance of the best petrol and oil cannot be properly consumed in a defective engine. The efficiency of consumption is measured by the relation of intake to output, with the state of the engine as the all-important factor in the equation. This is equally true of the human machine. The malnutrition in the face of plenty is then a problem of the individual, entailing as it does a study of the human engine and its output.

At this stage we can only touch upon the main features of this question as we have encountered it.

To illustrate the point of view from which we had to approach the problem, we will take as an example cases of malnutrition due to a specific deficiency—namely iron deficiency. By 'deficiency' we mean a shortage *in the body economy* of some necessity.

NUTRITION

Iron deficiency presents a clear-cut issue because it can be measured with reasonable accuracy and also because the effects of making up an iron deficiency can be clearly related to the iron content of the blood.

When we began our investigation we assumed that the generally accepted clinical standard of iron in the blood, a variable swinging from 80% to 100%, was also the biological standard. But the very persistent tendency in our population for the value to be at or about 80% rather than 100% set us questioning the accepted standards. The biologist's point of view differs from the physician's point of view. The standard of normality is generally accepted as 80% to 100% by the clinician because within these limits the individual seldom produces signs or symptoms and generally not only has no sense of sickness but has so much certainty that he is well that the clinician is not called upon to treat him as a patient.

The biologist, on the other hand, concludes that since 100% is the highest approximation in some people, it is more likely to be the level in health—in spite of any subjective sensation of fitness in individuals with a lower standard. A deficiency of iron is to the physician a matter relative to the incidence of sickness; to the biologist it is a declension from the highest amount attainable and maintainable.

The standard we now use is that 100% = 16.8 mgrs. of iron per 100 c.c. of blood. Any variation from 100% greater than 5% in either direction we consider worthy of close study and inquiry.

Working with this standard in making a review of the 1,666 individuals during the first eighteen months, we found 670 cases of iron deficiency in adults and 326 cases in children. Among this number were a few individuals with diseases of the blood tissue *per se* who possessed a symptomology; these were referred to outside agencies for treatment. The others were not 'cases' so that we could not get treatment for them through the orthodox channels. To them we ourselves gave iron in an attempt to see how far our hypothesis was likely to find substantiation.

We began by recommending iron in the form of domestic remedies such as Parrish's food, etc., but with no consistent

RESULTS OF EXAMINATION OF MATERIAL

results. We then substituted more modern methods, using liver-activated iron. These were usually immediately effective, in many cases raising the haemoglobin within a week or two to within the 100% range.

The next question was, did the values stay at that high level on ordinary diet, or was it only a temporary concentration due to the potency of the liver-iron food? In about half the cases the values were maintained and remain so after twelve months. In the remainder, within a week or a month or even three months the iron values had fallen again.

We then proceeded to a diligent search for a reason other than a dietetic one for this and, except in a few cases, we found a reason. Some other malady, often of very minor clinical significance and often hitherto unnoticed by us in the examination, was present in the individual. We have to assume that these maladies were the causes because by removing them where possible the iron values rose and could be sustained subsequently at 100% range on ordinary diet.

A striking example of this reversion to iron deficiency even under treatment with iron arose in certain children. They were infested with worms: ascaris, oxyuris and very occasionally tricocephalus dispar. The infestation was dealt with, iron again administered, the 100% range established and subsequently maintained on ordinary diet. Any fall in iron after three months seemed to coincide with a re-assertion of the infestation. Further treatment to eliminate the parasites was undertaken until the iron values remained at 100% range.* Only when the infestation was cleared could the iron values be stabilized.†

* The problem of repairing a deficiency is still not always as simple as this. For, after all infections and infestations were treated, in a few cases it was necessary to proceed further, and supplement liver-active iron by mouth with an injection of 'purified liver extract'. Shock tactics were needed to start the ball rolling. We have no explanation of this fact nor of the fact that certain other cases of severe deficiency of iron reject by vomiting or diarrhoea iron in any form given by the mouth. Curiously enough this can be overcome by injecting 'liver extract' and iron. As the haemoglobin values rise iron becomes tolerated by the mouth. The same intolerance of calcium by mouth has been found in calcium deficiency.

† Subsequent experience indicates that ordinary diet will, given time, do the same as treatment does in a shorter time.

NUTRITION

We must assume from this example alone that a deficiency can be sustained by other factors despite a rich plentiful supply of the active dietetic substance in default in the body; further, that a deficiency can recur in the face of a sufficient or even enriched supply when the exciting cause returns.

In another group of cases, sustained iron deficiency followed upon attacks of various febrile states, infectious and other. This has been commonly seen in children, who, coming back to us from hospital cured, undergo a thorough re-examination. Various deficiencies appear with great frequency, iron being a common one—generally indeed to a pathological degree within the clinical limit. We conclude from the fact that most of our members when attacked by febrile disturbances were at the 100% level, that fevers can induce deficiencies which the rich diet of convalescence may not re-establish in weeks or months. These cases need treatment with active iron. Many respond at once. Others resist treatment until vitamins and/or mineral salts are administered with the iron. Thus it seems that one deficiency can act like the parasites in sustaining another deficiency.

The same fact emerges after quite minor operations—an iron deficiency may establish itself and in some cases resist supplementary feeding with active iron until vitamins are added to the diet.

Iron deficiency can be detected and quantitatively studied. The same cannot be said for many other deficiencies. For deficiencies of vitamins, other mineral salts, water, etc., even of proteins, fats and carbohydrates, a different procedure has been adopted. Taking dystrophy⁷ as an index we have resorted to shot-gun methods—that is to say, feeding with several substances which it might be suspected were missing, and noting any improvement in the dystrophy.

Some vitamin deficiencies can be disclosed by this method; where this has been so the same conclusions have emerged as in dealing with iron deficiencies.

Using this method in the worm-infested children we found that those with no iron deficiency were often deficient in other things—e.g. in calcium and in vitamins—and

RESULTS OF EXAMINATION OF MATERIAL

remained so until the infestation was removed. Furthermore, some worm-infested children lack even gross nourishment; they do not use their proteins, fats and carbohydrates adequately for nutritional purposes. They may show weight-height anomalies, which behave as the levels of iron and of calcium do under treatment.

Thus what applies to iron deficiency seems to apply also to the other deficiencies; *effective utilization is the denominator of the equation of nutrition.*

But perhaps the most interesting group of cases is that in which the essential factor sustaining a deficiency was neither parasitic nor chemical but physical.

As an example of this we can cite three cases of iron deficiency in which, though no specific cause such as parasites or sepsis could be found or even suspected, a diet supplemented over a long period with iron, vitamins and minerals failed to raise the values or affect the dystrophy. Learning from our experience with some other types of deficiency, we secured for these subjects intensive exercise. The improvement was almost immediate, within fourteen days raising the iron values, until the 100% range was ultimately reached and maintained.

Movement demands metabolic turnover. If movement is absent demand is diminished and may result in one or other nutritional defect—low iron values, low vitamin values, low calcium values, low sugar values, among the more or less measurable factors. This is well seen in the infant so commonly strapped down in its pram morning and afternoon. When it wakes it struggles vainly to rise, only to meet frustration again and again. It is seen in the child pent up in the house, tethered to its mother's apron-strings, the only movement possible to it being fidgets. It has been our experience that release of children from restraint whether in the nursery or at play helps to establish the value of vitamins, iron and food in general, where previously ineffective.

Here it is want of mobility which sustains a deficiency, and may induce it—a very obvious example of ineffective utilization controlling and limiting the body's demand.

There are other examples of a similar kind. Simple over-

NUTRITION

clothing of the infant and young child may be manifest in the disturbed growth-weight curve, in poor appetite, in vitamin deficiency, etc. The reason is easy to see. The skin, which is a highly important functioning organ, operates normally among other actions as a cooling mechanism for elimination of the heat produced in the course of metabolic turnover. In the new-born and young child, where growth and development are at a maximum, the heat production is relatively very high. Any obstruction to the cooling of the skin is countered by limitation of the metabolic turnover. A car with a muffled radiator burns itself out; a baby unable to cool itself compensates by cutting down its heat production. Biological demand is reduced, growth is limited, nutrition is impaired—in spite of a sufficient quantity and quality of food. Effective utilization is again here the clue to the physiology of demand.

Then there is sleep—we are attaching greater and greater importance to the quantity and quality of this natural recuperative function. It has to be restful, for one thing. In the case of malnutrition in worm-infested children we believe that the restlessness of the day exhibited in nail-biting and other forms of irritability is continued into the night in restless sleep. Our reason for looking to the disturbed sleep for the cause of the malnutrition lies in the fact that we have found irritable rashes of a semi-chronic nature give rise to the same general symptoms.

If this is so then we are back once again to the possibility that a functional disturbance—restless sleep in this case—may give rise to nutritive inefficiencies by interfering with effective utilization.

We do not propose to deal here with the other varieties of malnutrition encountered, e.g. those characterized by accumulated *excess* of dietetic elements such as fats, carbohydrates, water and sodium chloride, except to emphasize the fact that they again are pathological expressions of demand being controlled by ineffective utilization, so that an excess may point to a deficiency of another order. The body, when effective utilization is not possible, does not always reject a nutritive element at the intestinal surface;

RESULTS OF EXAMINATION OF MATERIAL

it may reject it after absorption, i.e. hoard it in the tissues. We say 'hoard' rather than 'store', for a store is immediately available in emergency, but this does not seem to be the case with sequestered material.

From such experience it has become clear to us that the problem of nutrition cannot be solved by a study of the food supply on the one hand, nor of specific deficiencies on the other. It is primarily a problem involving the study of the nature of biological demand. In the biological economy of the individual, *demand* is linked with effective utilization. Effective utilization is an even more rigid controller of the effectiveness of a supply than is the case in material economics.

We cannot deal with the problem of nutrition therefore as a mere matter of supply—even when that supply is manifestly insufficient. Our experience suggests that any long-continued insufficiency in the supply is one of the most certain and potent causes of inefficiency in the body, and hence of ineffective utilization in the face of a renewed supply.

Thus it seems that there can be no panacea for malnutrition. Neither money nor milk nor vitamins are in themselves able to solve this problem, for at its very basis lies a lack of knowledge.

Our members often ask us how deficiencies arise. We began by answering their questions in the accepted manner, attributing lack of iron, for instance, to lack of fresh green vegetables and eggs, only to be told that the father was a great gardener and that they grew all their own vegetables and kept hens and that the mother was particularly fond of liver, which they had not less than twice weekly.

Thus it is not primarily a question of educating the people. It is rather a question of extending the inquiry into nutrition from the laboratory into the field.

A consideration of the paradox 'malnutrition in the well fed' seems then to partake of the general problem facing civilization, the problem of the utilization of wealth.

Section III

RESULTS OF EXAMINATION OF MATERIAL

PART II.—THE SUBJECTIVE FACTS

So far we have dealt only with some of the objective facts elicited by our procedure. We have given a brief survey of the maladies and disabilities found in the members. The next question is: How do they react to their suffering? What are the subjective facts?

The subjective facts present us with a totally different aspect of the problem under study. Without a knowledge of this subjective aspect any conclusions based on the objective facts would be misleading.

Before we can understand and adjudge the significance of the subjective facts, we must first recall the state of affairs that has always existed, and still exists at the present moment, between the public and the medical services of this country.

The doctor has to wait, with hands folded, until the individual member of the public makes a diagnosis that he is diseased, before any therapeutic skill can be exercised on the disorders underlying his disease. This attitude served so long as medical science could boast of little curative power. But with the growth of medical science came power to cure and alleviate sickness more satisfactorily and at an earlier stage. Only then did it become important to the doctor to get the material earlier, at the time most appropriate for cure or alleviation. The profession, now deeply sensible of this need, is always urging for some means of approaching the patient

RESULTS OF EXAMINATION OF MATERIAL

earlier than the primary diagnostician, that is the patient himself, thinks wise or expedient.

The overcoming of this difficulty seemed a subject fit for major experiment. One aspect of the Peckham experiment represents this attempt.

Already some significant questions have been raised. For example, the primary diagnostician being the patient, at what stage in the progress of illness does he consider it wise to seek treatment? On what does he base his action and how does he reach that conclusion? Inquiry along these lines has led us further and further into a consideration of the process of disease and disorders and of their relation to the assumed starting-point—health. Insufficient time has elapsed to enable us to arrive at any far-reaching conclusions but already we have opened up a field of inquiry that seems well worth tilling.

From the subjective point of view the individuals examined fall quite naturally into three broad categories. Between each category there is a common boundary or no-man's-land, narrow between the first and second categories, wider and less defined between the second and third.

These three categories are:

1. Disease.
2. Well-being.
3. Health.

1. *Disease*

The word 'disease' is used very loosely, not only by the public but also in most medical text-books.* 'Disease' may mean (1) the subjective state of the patient, (2) the objective findings of the professional diagnostician, or (3) both the objective findings and the subjective state as though they were either interchangeable or one and the same thing.

To avoid this confusion here we shall use the word 'dis-ease' to mean only the subjective state of the sufferer. The objective facts discovered by the professional diagnostician we shall term 'dis-order'.

* The same confusion can be seen in *The Case for Action*, where 'disease' and 'disorder' were used indiscriminately.

DISEASE

It may take more than one disorder to produce disease and the primary disorder need not produce the final disease. Disorders may be obvious to the individual—these we will designate ‘manifest disorders’—or they may be only manifest to the probing technique of the professional diagnostician—‘cryptic disorders’. Disease may be associated with either manifest or cryptic disorders. Clearly it is presumptuous to assume that medical science is able to diagnose all disorders; there are some that escape recognition and yet may produce disease—‘incipient disorders’.

Why be so precise? Because the *primary diagnostician is always the patient*, and his technique is based on disease, not on disorder.

The subjective state of disease arises from a disorder or disorders that have led to *pain*, to *discomfort*, to *disability*, to *limitation of action* (social incapacity*), i.e. to interference with the family, social and occupational life of the individual. One or other or all these conscious states are present before the individual will diagnose disease. It is quite clear that the primary diagnostician, the patient, gives little or no consideration to the disorder underlying his disease. It is the disease upon which he makes the diagnosis that treatment is inevitable. Disorder is the doctor’s concern. Disease is the patient’s only concern, whether the disorder is manifest or not.

In a survey of 1,530 individual members (those over five

* *Social incapacity from limitation of free movement* needs study and definition. It does not mean only sheer inability to work. It has varying connotations which differ with each individual. For example: a girl with spots on the face seeks a doctor’s advice. The doctor finds constipation, thoroughly bad feeding, long hours, total lack of exercise, and other causes of spots. He gives advice, together with a prescription for the spots. The spots alone receive the patient’s attention, because the girl is seeking male company and feels the spots a limitation to her social excursion.

Or, a man with a wen on his head which he has had for twenty-three years. He is promoted from the workshop to contact with customers. Three months after this he seeks the removal of the wen. In his new social excursion it has become for him a conscious social limitation. Tolerated for twenty-three years it becomes intolerable after three months in the new situation.

These examples will illustrate the great scope of what we mean by ‘social incapacity’. It obviously has a wide connotation.

RESULTS OF EXAMINATION OF MATERIAL

years of age) of 500 families, disease as we define it was present in 484. The disorders underlying the diseases were many and various but all merited and indeed demanded treatment. Only 121 were actually under treatment.

Very frequently when treatment had been sought the patient had discharged himself from attendance on the doctor; that is to say, when the consciousness of disease had been removed by palliations he had again ignored the disorder. The majority, however, had never sought the advice of the doctor, even though consciously suffering for years.*

This applies without reference to the seriousness of the underlying disorder, or, up to a point, without reference to the degree of discomfort or disability. In any case, first home remedies, then friends' remedies, then quack remedies, then the chemist and in the last resort the doctor, is the order of procedure of the diseased towards treatment.

Why then does the sufferer not go and take advantage of the medical services, either through the general practitioner, hospital or other institution?

It is often assumed that poverty and loss of work are the causes of this attitude, in spite of the existence of the panel and other free services. In the group we are studying this does not appear to be the case.

Human beings are not only individuals but also social, family and occupational entities—even sports club entities, etc., etc. The individual in them treats the social entity in them as of the major importance. Faced by disease, they call upon their courage to see them through. Needless to say, their ignorance as diagnosticians often makes this procedure farcical in the extreme. The first signs of gastritis are allowed to proceed to a gastric or duodenal ulcer with collapse, or giddiness to a cardiac failure, or painful flat foot

* The diseased conditions here referred to include besides those familiar to the therapist also those not often seen as *uncomplicated conditions* by the general practitioner or the out-patient department—such as corns, flat foot, worms, dental caries, hernia, varicocele, catarrhs (nasal, bronchial, vaginal, etc.), acne, bunions, constipation, early piles, painful and irregular menstruation, eye conditions, ear conditions, etc., etc. All these things that one encounters in advertisements of patent medicines and appliances and for which this, that or the other pill is recommended.

DISEASE

to varicose veins with ulceration. Nevertheless, few people deceive themselves by merely hoping for the best. Their attitude is the deliberate action of individuals with a wide sense of responsibility. They face the personal inconvenience, pain, etc., at the demand of the social situation, e.g. of circumstances within the family, of their work, etc.

Even in jobs where return to work after sickness is a certainty, they delay seeking treatment until the last minute. Loss of work is thus not an essential factor. Nor is the money situation the essential factor. Those of our members whose wages cease when they are not working mostly secure their financial position by paying into various organizations which keep the wage level the same in sickness as in health.* Yet they will not report sick until they are driven to it. The fact is that they want to live up to their situation—and to report sick is to knuckle down to the situation. They are reacting, like any free biological organism, to the *total situation*.

They can and do, in our experience, however, discuss this difficulty with the health doctor—he is different—*he is a fellow who is defending them in that very situation*. We cannot stress this psychological fact too much. Its importance cannot be over-rated. The fact that the health doctor has no interest in sickness or in its treatment is apparently a major contribution to this attitude of the sufferer. The health doctor is in the position of the solicitor, not of the barrister. With the barrister the litigant is a mere pawn in a winning or a losing game; with the solicitor he is a client who may or may not become a litigant.

In discussing the value of periodic overhaul it must then be borne in mind that *it matters who does the overhaul*; the solicitor or the barrister—the health biologist or the sickness doctor. The one will be approached in faith, the other in fear.

It is to be remembered too, as we have already shown, that the type of overhaul necessary for the detection of departure from health is not periodic observation but continuous

* The only exception we have found is the employer of labour who seems to make no such provision but must lean on the good-will of his business in these emergencies.

RESULTS OF EXAMINATION OF MATERIAL

observation. This is essential. This is one of the reasons why a social organization was necessary to house the health doctor. Continuity is essential, for sickness comes when it may, not at annual or any other set intervals.*

From what has been said above it would seem that in ordinary circumstances it is natural, human and even reasonable for the individual to report sick only at the last moment. From the practical point of view this means that any provision that exists for the treatment of the sick can and does only give service to those who have *in their own opinion lost their social capacity*. In other words, after an individual has lost his sense of social capacity, and after the pain and discomfort of his disease have minimized the importance of the disadvantages of being sick, only then does he come under the care of the curative services. This must inevitably make for a duration of sickness when it does come such as is commonly encountered in the panel, in hospital and in industrial statistics for sickness. It is a point of the utmost importance to realize that once a disorder or disability has become as serious as this, *time* is a most important therapeutic agent. But, as all administrators know, time is the most expensive of all cures.

It is clear even from the preliminary survey of the condition of affairs that the doctors have no part in the blame, if blame there be, for any time lag in the use of the public

* It might be said, and with a great deal of truth, that the old family doctor did, as *part* of his function, carry out to the best of his ability the function here outlined for the health doctor. There is a probability that some doctors, in a certain class of society, still fulfil this function to the best of their ability. But our technique discloses the need, as we have indicated, for something much more extensive and intensive than is available in any family doctor's surgery. Family doctors must wait for their introduction to a family for either sickness and ailment or a pregnancy. It behoves a family doctor to call on his *patients* when called upon to do so. He may meet the father at the club and the mother at some social affair, but in modern conditions he can know nothing of the family as a whole. But in general in every class of society the doctor operates in exactly the same way as the doctors in our own area. Even the rich man's attitude is that the doctor is the last and not the first resort in case of trouble. Except for the neurotic and neurasthenic it will always be so. The doctor, it is firmly fixed in the mind of the patient, is for treating disease, and once we are in his hands we can only obey him at whatever cost to ourselves, to our work or to our situation.

WELL-BEING

medical service. It is not the inefficiency of the doctor or medical service but the *unwilling patient*, handicapped by his ignorance of diagnosis, that more than anything else defeats efforts to secure efficient treatment of disorders. Under existing conditions it appears that however much diagnosis and treatment are improved by the advance of medical science, they can only be applied under the worst instead of under the best conditions. Hence the curative services cannot work at the pitch of their efficiency because they are not presented with the material which in fact permits them to be most effective; i.e. with early disorder. Clearly, therefore, research work in therapeutics and diagnosis must go hand in hand with research work into how to reach the individual at the best moment for the application of medical skill. But so little has this point been appreciated that the Centre seems to be the only field of experiment where this subject is being studied.

The above analysis of the 'diseased' only touches upon one small part of the subjective problem, as we shall see after consideration of the next group of individuals.

2. *Well-being*

Out of the 1,530 individuals there were 902 with a well-defined, almost assertive sense of well-being. These form by far the largest group. They do not complain; they assert that they feel fit. They are to be distinguished from the non-complaining who are conscious of disease and who have been included in the first category.

These individuals with a sense of well-being reveal on examination a number of different conditions from a carious tooth to cancer. These disorders produce *no* seeming discomfort, *no* seeming disability, *do not* seem to limit activity—i.e. to interfere with the social or occupational life of the individual. They are never consciously painful.

The disorders encountered in 'well-being' seem to be identical with those found in disease. Disorders, then, can occur without *disease*, although disease cannot occur without disorder. Well-being, like disease, is thus a subjective state by which the actions of the individual are regulated.

There are, of course, varying degrees of well-being. The

RESULTS OF EXAMINATION OF MATERIAL

most exuberant sense of well-being can, however, be associated with the gravest disorders or with the most trivial disorder, or vice versa. The nature and seriousness of the disorder does not govern the quality of the well-being.

The following are a few examples of the manifest disorders which these individuals in well-being make nothing of—indeed some of them strongly resent the suggestion that they should waste time getting rid of the disorder—tumours, varicose veins, obesity, underweight, frequency of micturition, various eye and ear conditions, constipation, flat feet, callosity of feet, shortness of breath, palpitations, nervousness, etc., etc. These are manifest disorders but they may themselves be symptoms of major underlying cryptic disorders.

As examples to be encountered of the cryptic disorders, about which the individual with well-being knows nothing, are heart disorder, kidney disorder, tuberculosis, bronchiectasis, gastric ulcer, appendicitis, worms, hernia, undescended testicles, piles, proctitis, tumour of the uterus, cervix and breast, tonsillar enlargements, adenoids, sinusitis, high blood pressure, low blood pressure, glycosuria, hyperglycaemia, hypoglycaemia, uraemia, anaemias (including pernicious anaemia), calcium deficiency, etc., etc.

In the face of the formidable nature of such disorders, we must look for some explanation of this subjective sense of well-being. Upon what does it depend? On some psychological fortitude, or perversity, present in one individual, absent in another? A little experience of these individuals seems to rule this out, for in the majority of cases, once the condition (when cryptic) is pointed out, there is an eagerness to have it cured or adjusted.

Well-being, we suggest, springs from consciousness of the effectiveness of the compensatory mechanism of the body.

This state of well-being can mask major disorders of the gravest kind or provide a cover for the many minor disorders. An illustration of the major disorders is a would-be boxing and gymnastic champion actively pursuing and enjoying his enthusiasms, who was found to sustain cheerfully valvular disease of the heart, nephritis, a blood pressure of 230 and an almost solid albuminuria. He was a youth of

WELL-BEING

twenty-one who had never felt fitter in his life and whose appearance and actions seemed fully to correspond with his feelings. The primary disorder was seemingly lost in a number of other grave disorders. But the youth's defensive mechanism was still flexible, for re-adjustment of his actions and diet to his capacity disclosed valvular disorder of the heart as the only irremovable disorder. It was his sense of well-being which had led to additional strains being placed on other organs of the body. In well-being there is this fundamental danger—it deceives the individual and in cases of this kind the casual observer also.

The above case illustrates also the mechanism which operates to deceive. It is the natural power in the body to compensate for the shortcomings in one function by calling on the reserves of another function, or functions, to maintain as balanced an action of the whole body as is possible. So long as compensation is effective, just so long does well-being continue.

But compensation, however effective, makes calls upon reserves and induces additional wear and tear. In the case of this boy the wear and tear was unduly great because he was not using *all* the compensatory or defensive mechanisms. He had omitted the conscious limitation of his general activity and his fuel intake—but he was bound to omit these necessarily conscious efforts because he was unconscious of his disorders. Nevertheless, the compensation itself was effective. The price paid was extra wear and tear, inevitably hastening the ultimate breakdown of compensation and shortening the expectation of life. Adjustment by conscious effort* minimized this wasting process, enabling him to live to the fullest capacity permitted by the disability.

In this case the primary disorder of the heart left behind it irretrievable disability of the cardiac mechanism, which means that this individual must live always in compensation. All disorders are not of this kind; some are amenable

* This therapeutic measure, the rehabilitation of the lame, whatever the lameness, is one of the more recent branches of therapy recognized by the medical profession. It is seen, for example, in the extension of the almoner's work and in the follow-up schemes of many hospitals. But these, of course, can only apply to the diseased who have reached hospital. Disorders with well-being escape such opportunity.

RESULTS OF EXAMINATION OF MATERIAL

to cure. Take, for example, the case of the obese blacksmith with all the cheerfulness of an exuberant well-being. Weighing 14 stone (height 5ft. 7in.) he had a blood pressure of 260, a red cell count of $6\frac{1}{2}$ millions with a haemoglobin of 17.8 grammes (= 112%). Dietetic measures alone were undertaken for his adjustment, for it was assumed that his occupation gave him exercise enough. This was not the case; his weight remained unchanged on a restricted diet. Swimming as a remedial exercise was then added. Immediately his weight began to fall, and is now at 11 stone. With this reduction in weight his blood pressure fell to 180 and his blood picture is now 5 million red cells and a haemoglobin of 16.8 grammes. He now knows that his cheerful well-being covered a really embarrassing condition of which he was at the time unaware.

Again we see a train of compensatory efforts by the body which if continued would have led to disaster, the breaking point in this case probably being the high blood pressure (apoplexy). The primary disorder arose because a man eats to suit his appetite, which in turn depends upon his biological capacity. This is represented by his build, skeleton, general musculature, etc., and not by the few highly specialized muscles used in his craft.

What happens when a disorder underlying a subjective state of well-being is cured? The individual generally informs you spontaneously that he knows *now* that he had been suffering. The relief of an almost trivial disorder, where well-being would seem to have been very near to health, is often better appreciated, perhaps because of its suddenness, than that of a more serious disorder. In the more serious disorder compensation has become fixed as a habit which it may take a considerable time to re-educate.

It is not sufficient merely to remove the disorder. It is often necessary to re-educate the body out of the *habit of compensation*—for example to re-educate the muscles which have compensated negatively by becoming inoperative, as in flat foot, or to correct the habit of the spine and body muscles that have over-acted to correct a limp, as in some fractures. That which applies to muscular function applies to all other functions. It is necessary to dehabituate long-

WELL-BEING

established compensations, as part of the remedy, before all subconscious limitations can be abolished. But whenever a cure can be accomplished it is accompanied by recognition of past subconscious suffering.

It would seem the rule then that well-being has subconscious suffering as part of its complex, and that this is so in spite of the effectiveness of the process of compensation in sustaining the total situation for the individual.

We began with a negative description of well-being as having neither conscious suffering, disability nor limitation of action in the individual's total situation. It seems now that it has positive characteristics: *subconscious discomfort*, *subconscious disability* and *subconscious limitation of action*.

It seems that we may go further and set up the hypothesis that *well-being, with its subconscious suffering, depends upon an effective compensation maintaining the balance of the whole individual in his situation.*

Because all too many disorders are cryptic and need the professional diagnostician to disclose them, the operation of this compensation is necessarily limited to subconscious action. All the important conscious actions of the body are omitted—for example: altered diet, regulation of general activities, the adoption of work suitable to the individual's capacity. Thus, often over long periods of time, unnecessary wear and tear are thrown on the subconsciously acting organs or muscles, thereby hastening disintegration and, when the breakdown ultimately comes, rendering cure more difficult, if not impossible.

This subconscious compensation is often seen in its extreme form in pregnancy. Together with the growth of the foetus there evolves within the maternal body an increasing functional capacity. For example it is well known that a woman with a damaged heart may come safely through pregnancy in spite of the increased demand made upon the circulatory system. It is not so well known that each pregnancy that she sustains in these conditions takes something like ten years off her expectation of life. The general reserves that come into play at this time help out the heart, so that its embarrassment remains subconscious. The extra wear and tear it suffers during this period only appears at

RESULTS OF EXAMINATION OF MATERIAL

the latter end of life when its origin escapes notice. What is known to be the case with the disordered heart in pregnancy must also be true of other organs and other functions.

What are we to infer from women setting out upon pregnancy with gross deficiencies, for example, of iron or of calcium? Such deficiencies deplete the natural functional reserves, lowering the expectant mother's capacity, exposing her to dangers at confinement, making lactation difficult if not impossible and storing up trouble for her in the future; all often under cloak of a heightened sense of well-being during the pregnancy.

But this is not the whole significance of her masked disorders. Her shortcomings may be shaping the child's constitution and thus handing on to it her deficiencies with still more far-reaching effect.

Our studies suggest that an infant with a haemoglobin of 70% lives and develops to *that limit* of his total capacity. This is yet another example of compensation, operating from infancy and throughout the whole growth and development of the child if it remains undiscovered. By studying the growth-weight curve, the child can be seen to assume a new balance when the 70% is rendered 100% by treatment. This applies not only to infancy but to the whole differentiating and growing period. So that a child left to grow with deficiencies will grow and develop to their limitation of its total capacities—a condition of degeneration or atavism.

But deficiencies in the intimate environment provided by the maternal state are not the only causes of persistent deficiencies existing under cover of well-being in children. We have learnt from experience, for example, to associate a persistence of anaemia despite treatment, or relapses following treatment, in children with such things as an infestation with worms (not otherwise suspected). Here again the anaemia sets a limit to the smooth progress of both differentiation and growth. This is degeneracy in the making, arising from a prevalent infestation during childhood.

Now it would seem utterly impracticable, economically and otherwise, to proceed to exclude item by item all the disorders that may be covered by well-being. How is the difficulty to be overcome? Clearly it is worth discovering if

WELL-BEING

well-being represents the subjective expression of an underlying physiological process of the body—i.e. compensation. Has compensation, which clearly seems an expression of the adaptative function of the organism, any characteristics which distinguish it *per se*? Does its presence, for example, alter or check the growth-weight curve in developing children? There is a suggestion that it may do so. If so, then here is one possible line of approach to detect the presence of effective compensation. Thereafter the detailed detection of the specific disorder can be proceeded with. From that a search for similar smooth-curve processes in adults would carry the study into the field of adult well-being in a practicable way. A study of the subject would probably be well worth undertaking.

We would further note that there are incipient stages to many disorders. The most practicable method of approach to the problem of early diagnosis which they present would be the detection of the onset of the compensation which masks them. Until we can find a means of doing this, incipient disorders or stages of disorder will for ever escape study.

We have seen how those consciously diseased avoid treatment. In well-being there is an incomparably more serious difficulty to overcome—the fact that the disease, which is the ultimate incentive to seek treatment, remains subconscious, so that there seems to be no reason at all for the people in a state of well-being to seek the benefits of medical knowledge. In our small group they represent an overwhelming number, so that we must presume that unless a solution of this difficulty is found, we cannot hope to see a healthy nation. Clearly a solution of this problem cannot lie in the dissemination of knowledge or in the education of the people in the subject of disease and disorder. It demands some means of contacting the individuals in well-being so that they may derive the benefits of medical diagnosis and skill.

So much for 'well-being'. It is not health, for we cannot conceive of health as having an underlying subconscious suffering. Health will have a clear consciousness, however deep we probe.

RESULTS OF EXAMINATION OF MATERIAL

3. *Health*

Having as yet no positive criterion of health, we are in this first survey obliged to use the term 'healthy' to describe those individuals in whom no disorder could be detected. Proceeding thus negatively we could find no more than 144 healthy individuals over 5 years of age among the 500 families. That is from the pathological approach.

To these we may add, of course, any of those in well-being or disease whose disorder has been cured. Clearly, however, some more positive approach to health must be possible, based on a knowledge not of pathological but of biological process.

We have no means of measuring or even detecting health positively. Before we can approach this problem we must have some hypothesis to give a direction to the search. The foregoing consideration of disease and well-being may have provided us with the basis for such a hypothesis.

Well-being presents us with a picture of a machine operating upon itself to a greater or a lesser extent, to achieve effective compensation in the face of a disorder. The most trivial disorder, such as flat foot in children, may slow up or interrupt the smooth progress of the height-weight process. This would indicate a check to the process of synthesis implied in growth and differentiation.

Can health then represent the smooth progressive process of synthesis? Is it the expression of the adaptative function of the organism operating progressively upon the extrinsic medium—the environment—a process implying cumulation? Whereas the process of compensation sustaining well-being operates upon the intrinsic medium, using up the reserves of the body and implying a spending or wasting process, the opposite of cumulative synthesis? Should this be the case, then the medium as well as the process is different in the two states. This hypothesis, for what it is worth, permits us to attempt a comparative study of well-being and health.

We have already made a beginning in this direction. We have created the opportunity, collected material suitable for this research.

HEALTH

Our tentative conclusions concerning disease, well-being and health are then the following:

Disease ensues in the absence of effective compensation for some disorder of function.

Well-being ensues as the result of effective compensation, but since compensation is a disfunction it is accompanied by a subconscious want of ease. The effectiveness of the process of compensation is estimated from the organism's appreciation of its total situation and not from its internal situation.

Health ensues when the organism is not turned in on itself to effect a compensation but is exercising its adaptative function on the total situation, i.e. on the environment rather than on itself.

The difference between health and well-being is that the one operates with a cumulative deposit account and the other on a diminishing current account.

That the substance of this preliminary report deals only with the pathology and physiology of the physical life must not be taken to indicate any pre-occupation with this aspect of health alone. Mental and social action also exhibit opportunity for study and observation. These are less familiar fields for which there is no ready means of measurement, so that the fruits of these observations must wait the development of a technique, which, as in the physical field, will be that forced upon us by the material itself.

SUMMARY
DERIVED FROM CONSIDERATION OF THE
SUBJECTIVE FACTS

1. The efficiency of the medical services depends primarily upon diagnosis.
2. The primary diagnostician is the sufferer.
3. Therefore the primary diagnosis depends upon the subjective state of disease.
4. The sufferer, however, is guided to seek treatment, not by his subjective state of disease, but by consciousness of social incapacity.
5. There may be a wide lapse of time between the sufferer's diagnosis of disease and his diagnosis of social incapacity.
6. The professional diagnostician is concerned with the objective facts, i.e. the disorders, which underlie the disease of the sufferer.
7. A toothache may produce more *disease* than the most dangerous cancer. There is no necessary parallel between the degree of disease and the nature and severity of any underlying disorder.
8. The sufferer is too often content to have the disease alone alleviated, even when a cure is available for the underlying disorders.
9. Disorders do not always cause disease; they may remain masked by a sense of well-being.
10. Well-being, like disease, can be associated with any form of disorder.
11. Well-being, like disease, has varying degrees. The most exuberant sense of well-being may be associated with the most serious disorder.
12. Well-being completely discounts for the individual the importance of any manifest disorder.

SUMMARY

13. Well-being deceives not only the individual but also the casual observer, however well trained in diagnosis.

14. It is not, as in disease, the unwillingness of the sufferer to seek treatment which keeps the disorders underlying well-being from the medical services, but well-being itself.

15. Therefore well-being must be studied if we are to find a way out of this impasse.

16. Hence the recognition of well-being as a cloak covering every kind of disorder is of primary importance.

17. As it would be hopelessly impracticable to apply every available test to exclude each and every known disorder, a test must be found for the detection of well-being.

18. This can only be done through a study of well-being itself, not of the disorders that underlie it.

19. This implies a comparative study of well-being and health.

20. Our hypothesis to be tested is that the sense of well-being is the consequence of the effectiveness of the process of compensation in the body.

21. This effectiveness of compensation may be costing the body dear because it is being maintained at the expense of extravagant wear and tear of the compensating organs.

22. Compensation is brought about by the adaptative function of the organism turned into a defensive measure and is carried on at the expense of the reserves of action and function. It is thus a spending or wasting process.

23. The adaptative function of the organism is in health directed to the digestion and synthesis of the external material and the conditions of the environment. Health is thus a process, not a state. It is a cumulative as opposed to a spending process, not defensive but acceptive.

24. On this hypothesis it may be possible to direct experiment and observation towards a comparative study of the physical processes of health and well-being respectively.

25. This research work demands suitable material, so the major problem still remains: how to collect and retain families suitable for observation and research?

An analysis of some of our experiences in this attempt and of some of the difficulties attending it, is presented. At the date of presentation of this report, time, and that only

SUMMARY

because time means money, seems the one factor threatening progress of this study.

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APPENDIXES

APPENDIX I

LABORATORY SCHEDULE

Name..... Age..... No.....

Date				
*Vision:—				
Without glasses L.....				
R.....				
With glasses L.....				
R.....				
Ishihara test				
Blood:—				
Hb.				
Reds				
Index				
A.D.....				
Whites.....				
Polys.				
S. Lymphs				
L. Monos.....				
Eosin				
Basoph				
Myelo				
Sugar				
Urea				
Uric ac.				
Calcium				
Chloride				
†Kahn.....				
†Van der Bergh.....				
Coagulation Rate				
Bleeding time.....				
Urine:—				
Albumin				
Sugar				
Acetone				
Indican				
Urobilin				
Blood				
Urea				
Uric ac.				
Purins.....				
Urea: uric ac.....				
Purins: uric ac.				
Microscopical				
Ph.				
Height.....				
Weight				
Spirometer				
Temperature				

* See page 97.

† Not used as routine.

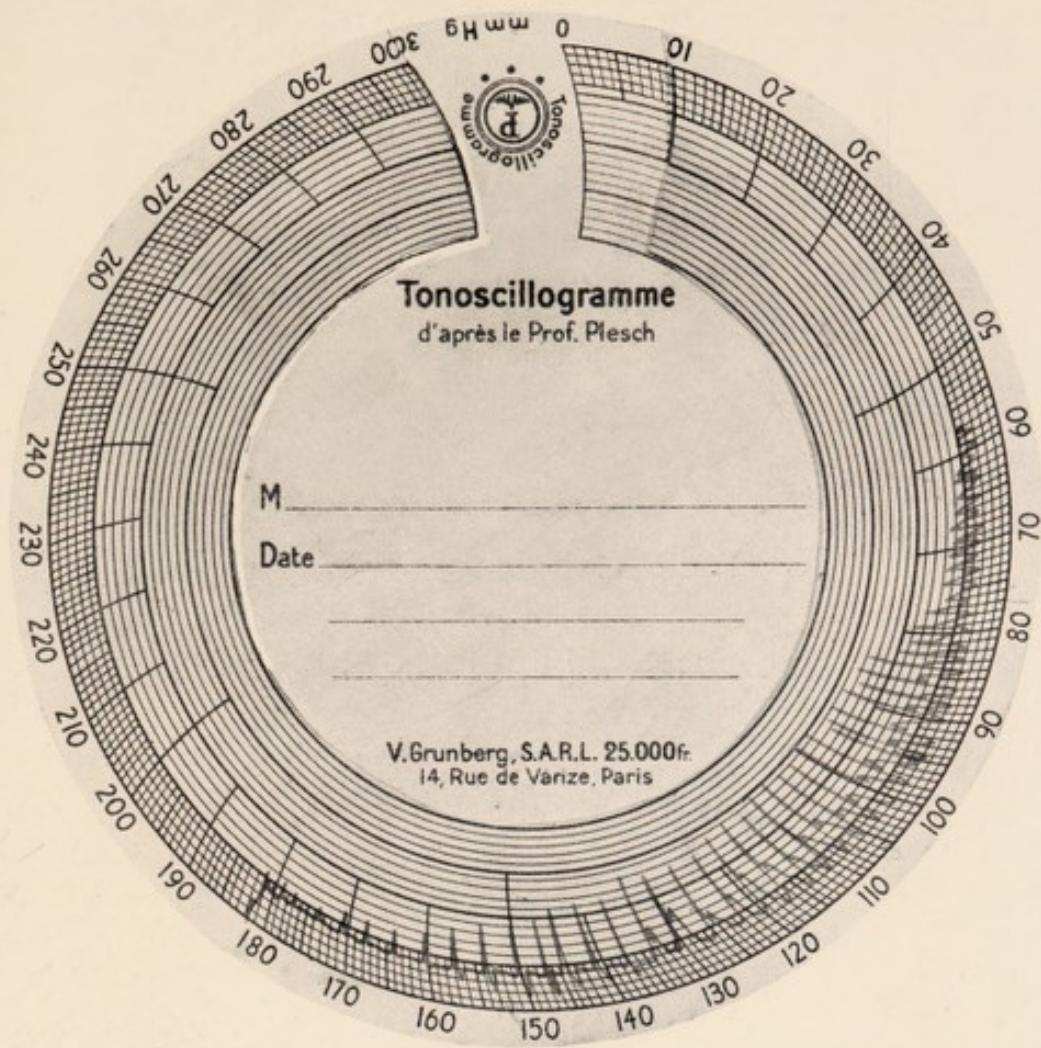


PLATE I

The above form is used on the Plesch Tonoscillograph to give a graphic record of the blood vascular condition. This test is made both with the subject at rest and after exercise in all cases, and is repeated wherever any change in the condition of the individual demands study.

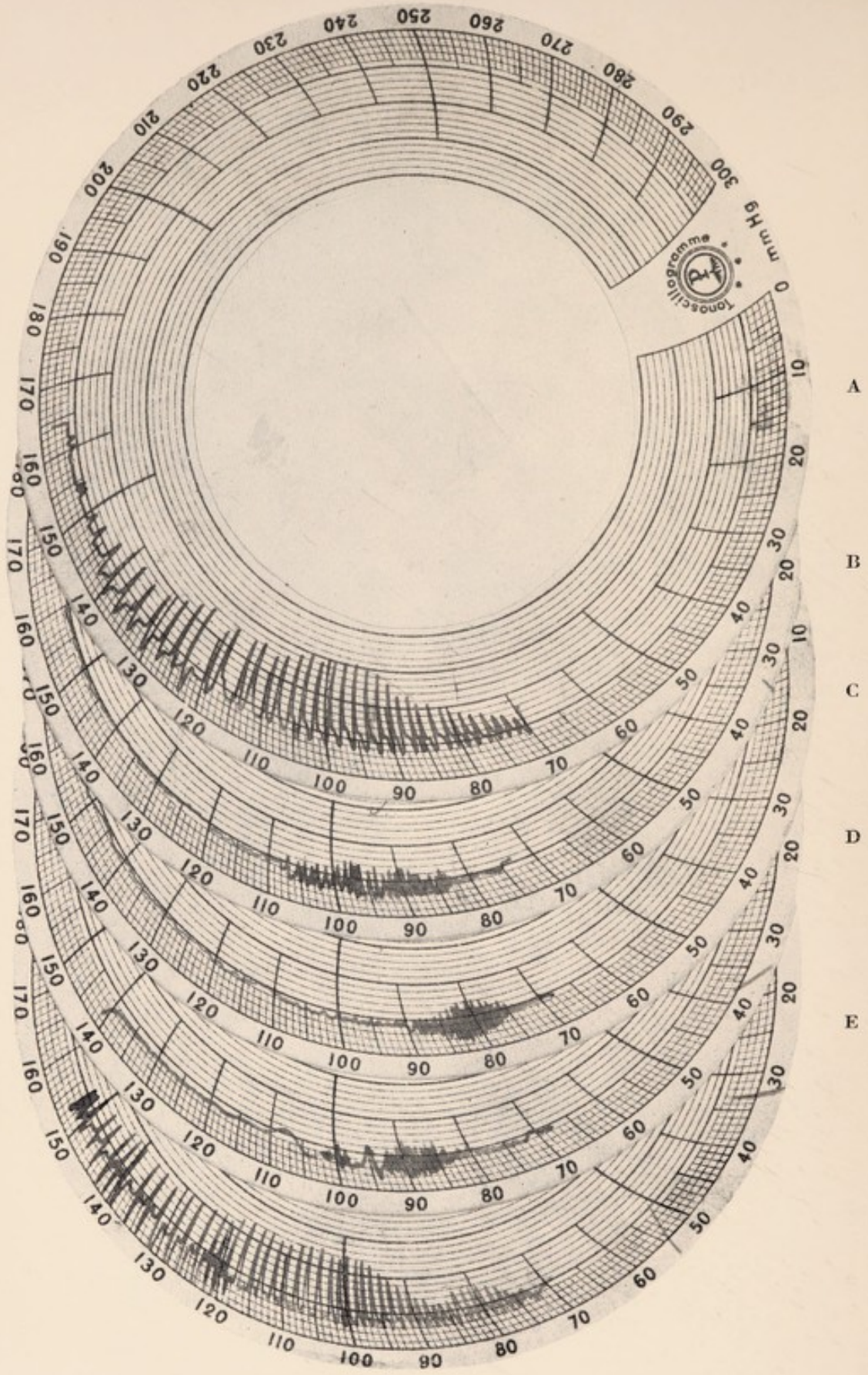


PLATE II

- A Plesch tonoscillogramme showing the progressive effects of night duty on the blood pressure, pulse rate and cardio-vascular tone.
- A. Tonoscillograph recording after day duty—night sleep.
 - B. Tonoscillograph recording after one week's night duty; taken after nine hours' sleep.
 - C. Tonoscillograph recording after two weeks' night duty; taken after nine hours' sleep.
 - D. Tonoscillograph recording after three weeks' night duty; taken after nine hours' sleep.
 - E. Tonoscillograph recording after week-end rest and return to day duty.

APPENDIX

During the first year a very thorough ophthalmological examination was made only when any defect was indicated by preliminary tests for vision in the laboratory. At the second overhaul full tests have been carried out on each individual. All children under sixteen are now undergoing full tests at the time of their first overhaul.

APPENDIX II

AN ILLUSTRATION OF THE EFFECTS OF NIGHT-DUTY

Day Duty

Superlative effortless muscular tone.

High respiratory capacity, deepened, not hurried by effort.

Blood pressure normal.

Full normal pulse impulse (short systolic, longer diastolic after effort).

High social aptitude.

Psychologically alert and aware.

Normal blood sugar.

Height-weight normal.

Bowels bis die.

Night Duty, after nine hours' sleep

Poor muscle tone.

Low respiratory capacity, hurried by effort, not deepened.

Blood pressure drops very low.

Low pulse impulse (systolic and diastolic same interval, but hurried).

Social inertia.

Psychologically sleepy.

Weight falls rapidly (? water loss).

Bowels—acute constipation.

Blood sugar—down to 50.

(Note:—The recovery is almost immediate with day duty and night sleep.)

APPENDIX III

CONDITIONS OF MEMBERSHIP
AND MEMBERSHIP FEES

There are three conditions of membership.

1. Only families may join, not individuals.
2. They must live within the arbitrarily defined area which the Centre serves. This is bounded on three sides by railway lines and on the fourth by a main road. It contains between 4,500 and 5,000 families.
3. Each individual in each family must come up for the regular health overhaul.

Fees

Each member-family pays 1s. a week, which covers father, mother, and any children under 16 years old. Children over 16 have the right to join with their family, if they are living at home, and they are charged a further 6d. a week each unless still at school. All the club activities, e.g. swimming, gymnasium, roller-skating, etc., are free for the children under 16, whereas small charges are made for all of them to adults and children over 16, not still at school.

APPENDIX IV

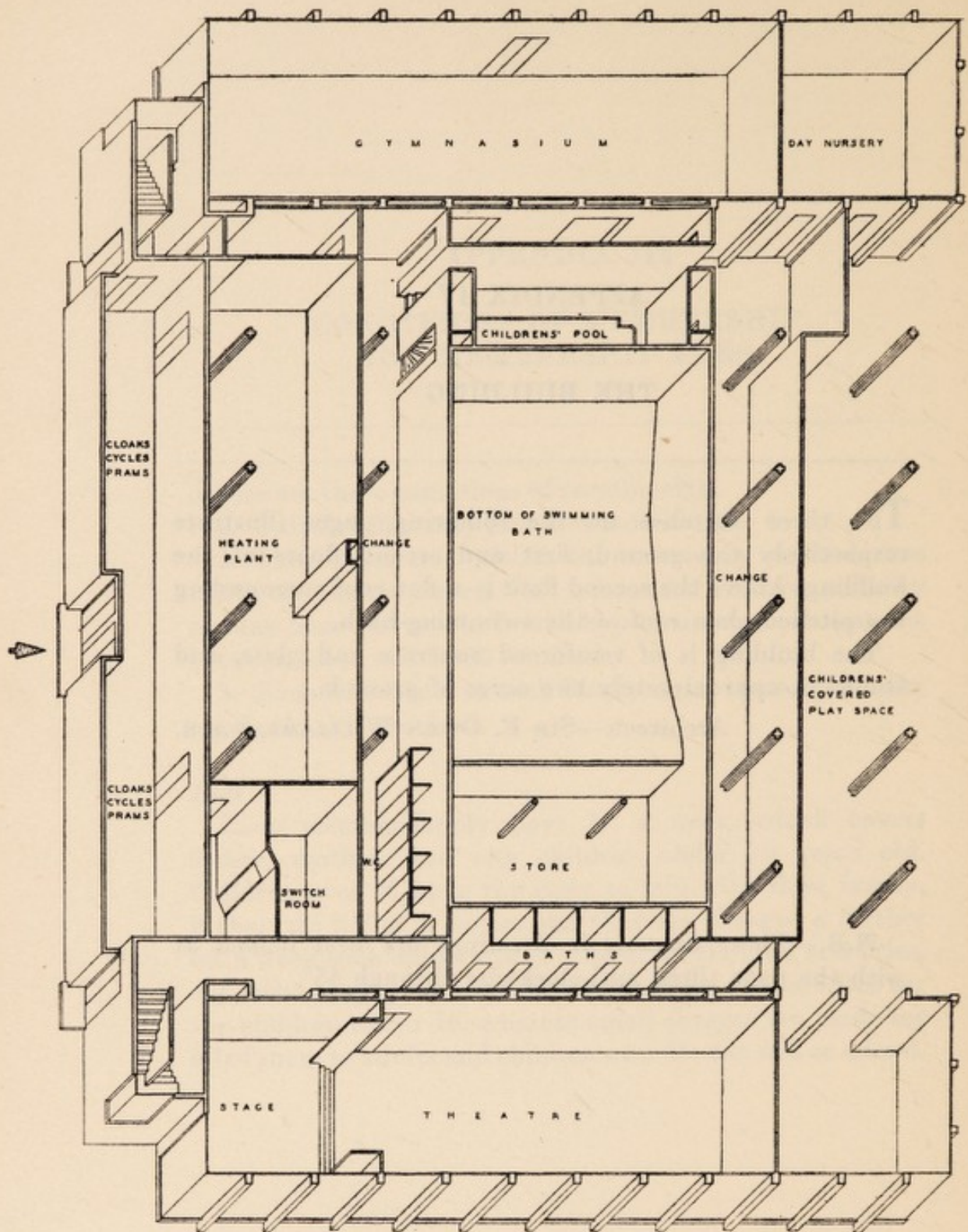
THE BUILDING

The three sketches on the following pages illustrate respectively the ground, first and second floors of the building. Above the second floor is a flat roof surrounding the pitched glass roof of the swimming-bath.

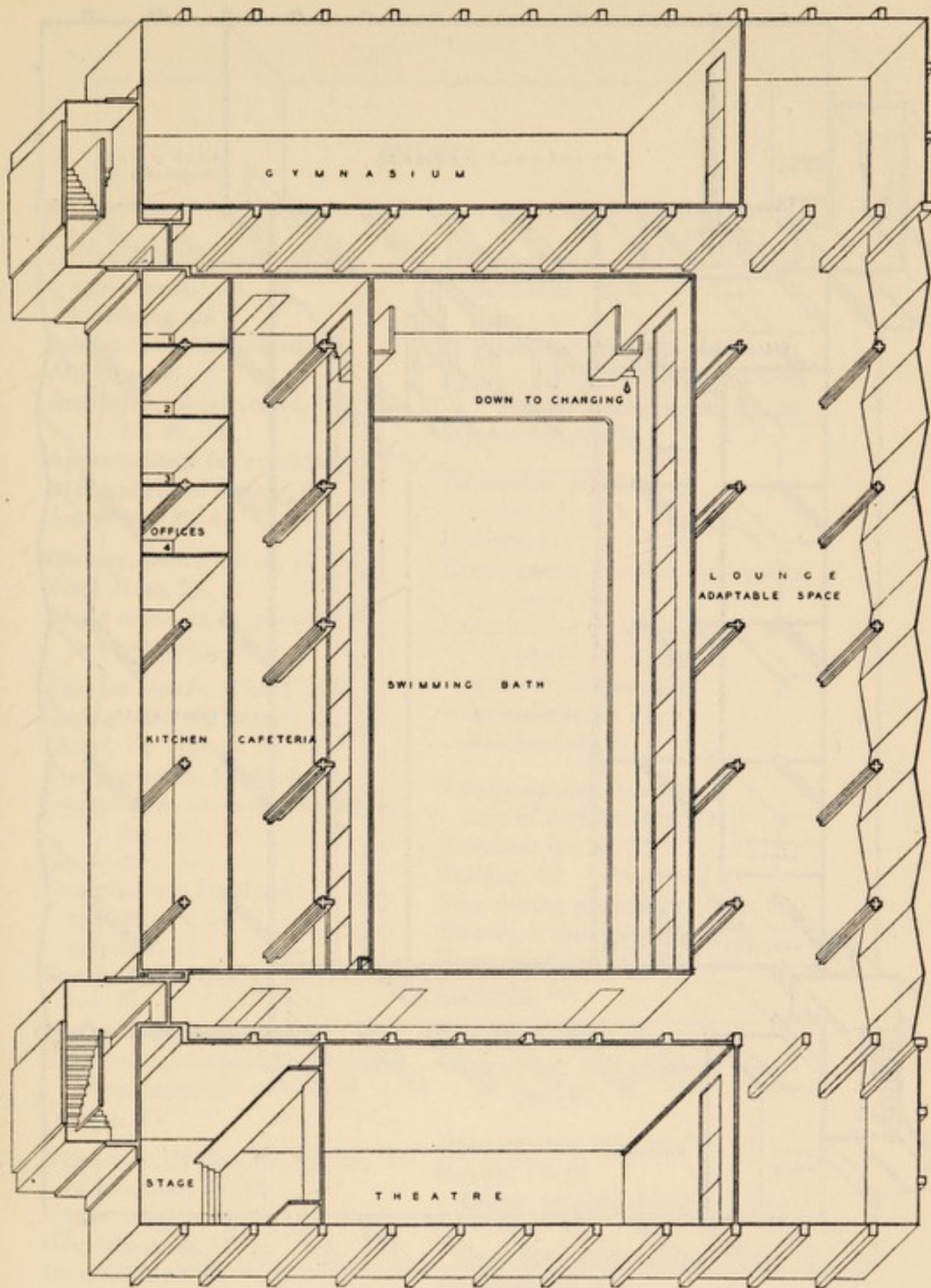
The building is of reinforced concrete and glass, and stands in approximately two acres of grounds.

Architect:—SIR E. OWEN WILLIAMS, K.B.E.

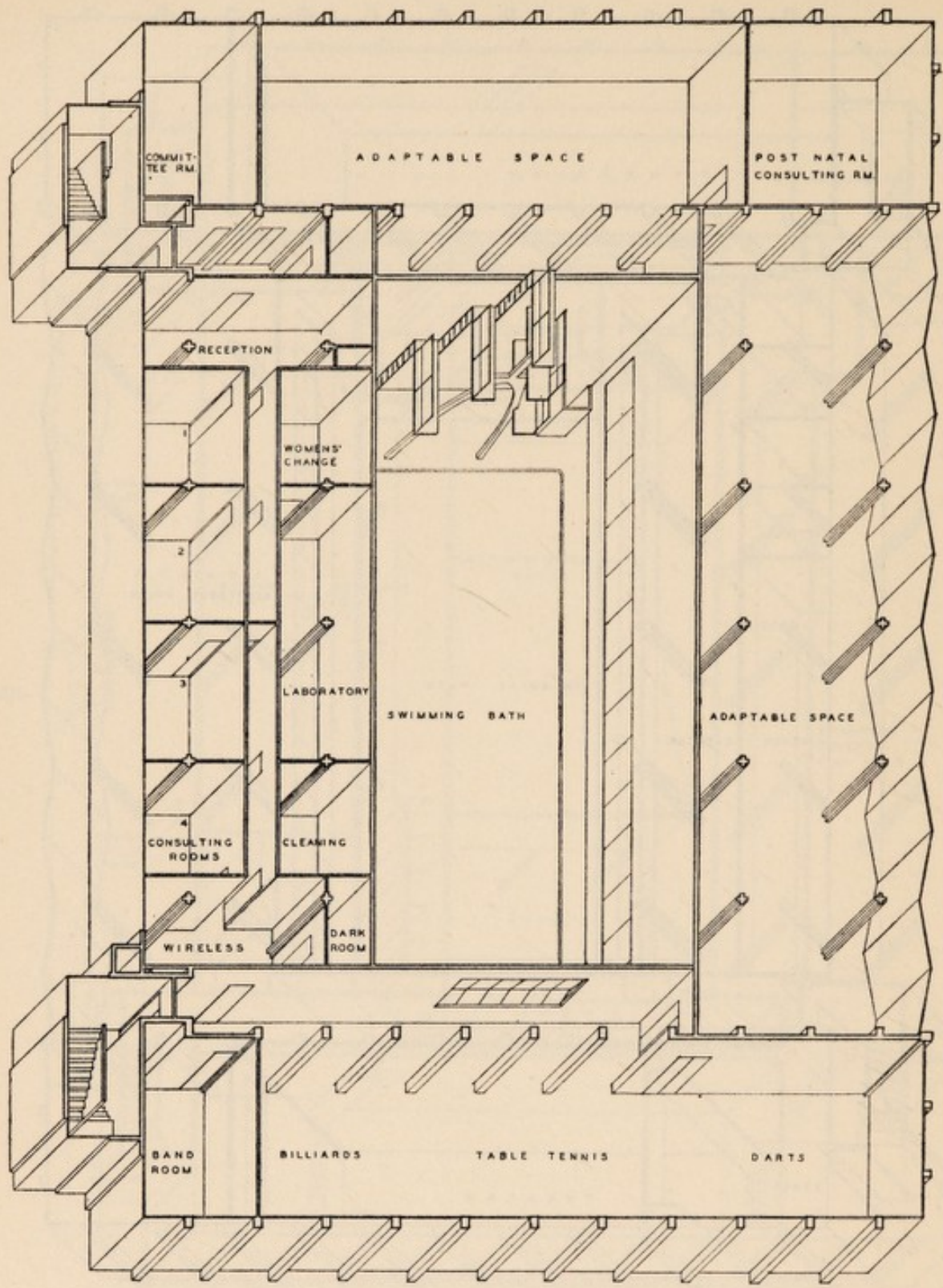
N.B.—These axiometric drawings are best looked at with the page tilted anti-clockwise through 45° .



GROUND FLOOR



FIRST FLOOR



SECOND FLOOR

INDEX

- Action, limitation of, 42, 79
 spontaneous, 41
Advertising, 34
Advice not volunteered, 49
Altruism, 41
Analogies, mechanical, 59, 65,
 67, 70, 75
Appointments for overhaul, 43, 52
Atmosphere of Centre, 40
Authority, 38, 41
Biology, definition of, 17
Birth Rate, 23, 67
Blood sugar, in Hypotonia, 65
 in Dystrophy, 68
Case for Action, The, 17, 38
Caviare and old brandy, 21, 25
Carrel, Dr. Alexis, 23, 28
Compensation, 59, 84-9
Compulsion, necessity for avoid-
 ing, 39
Conception, 45
Consultation, family, 44
 pre-marital, 44
 parental, 45
Continuity in Health Service, 26,
 81
Controls, experimental, 40
Cultivation, compared with thera-
 peutics, 19
Culture, 39
Deficiency, of iron, 53, 69, 71
 of vitamins, 69, 73
 transmission of, 88
Devitalization, 63
Discipline, 38, 41
Disease, 78, 91
 schedule of, 53
 incidence of, 80
 definition of, 78
Disorder, 83-9
 definition of, 78
 major, 56
District, nature of, 34, 43
Doctor, at Centre, compared with
 General Practitioner, 25, 50
Dystrophy, 68, 73
Education, physical, 27
 social, 26
Egoism, 41
Employment, nature of mem-
 bers', 55
Examination, laboratory and
 physical, 44, 96
 peculiar nature of, 47
 facts disclosed by, 53
 standard of, 54
Family consultation, 44
 unit of membership, 33
Families, size of, 55
Fatigue, 66
Fear during pregnancy, 45
Fiancé(e), membership of, 33
Finance of Centre, 1937, 27
Freedom, 40
General Practitioner, 50, 61
Government and physical educa-
 tion, 27
Haemoglobin, standard of, 71
Health, 78, 90
 Doctor compared with solicitor,
 81
 hypothetical definition of, 19
Hospitals, 62, 85
Housing Policy, effect on G.P., 51
Hypotonia, 23, 64
Instruction, 38, 39, 41

INDEX

- Instruments of action, 38
 Infectious fevers, sequelae of, 59, 69
 Influenza, 66
 Iron deficiency, 53, 69, 71
 Laboratory overhaul, 44, 96
 Limitation of action, 42, 79
 subconscious, 87
 Lloyd George, 51
 Maladies, major, 56
 minor, 24, 57
 schedule of, 53
 Malnutrition among well-fed, 22, 70
 'Man in the street', 38
Man the Unknown, 23
 Mechanical analogies, 59, 65, 67, 70, 75
 Medical student, 62
 Membership, conditions and cost of, 100
 continuity of, 37, 43
 recruiting of, 34
 statistics, 34
 Midwife, 46
 Movement a nutritional factor, 74, 86
 Night duty, 66, 98
 Nutrition, 65, 69, 70, 76
 Observation, social, 48
 Occupations of members, 55
 Opportunity without leadership, 26
 Overclothing, 74
 Overhaul, regular, 24, 44, 47
 Panel service, 51
 Parental consultations, 45
 Pathology, description of, 18
 contrasted with biology, 19
 P.E.P. Health Report, 27
 Personality of staff, 40
 Physical education, Government scheme, 27
 Physiology, applied, compared with biology, 18
 Plesch Tonoscillographs, facing pp. 96, 97
 Political suasion, 39
 Poverty, absence of, 55
 Pregnancy, 45, 65, 87
 Pre-marital consultations, 44
 Recruiting of members, 34
 Religion, 39
 Remedial work, 26
 Research, long term, 22
 short term, 24
 Government, cost of, 27
 Nutritional, need for, 76
 Responsibility for health, 50
 Rules and regulations, absence of, 41
 Scarlet fever, case of, 58
 Schedule of maladies, 53
 Sleep, 75
 Social education, 26
 incapacity, 61, 79, 82
 observation, 48
 Specialist service, 61
 Spontaneity of action, 41
 Starvation, 22, 56
 Student, medical, 62
 Subconscious discomfort, 87
 Subjective facts, 77
 Subsidy for Centre, compared with cost of sickness, 27
 Sugar, blood, in Hypotonia, 65
 in Dystrophy, 68
 Technology, 20
 Therapeutics, compared with cultivation, 19
 Tonsils and adenoids, 54, 58
 Treatment, 60
 effect of, 63
 moment of commencing, 77-83
 Utilization in nutrition, 74, 76
 Vitamins, deficiency of, 69, 73
 Wage levels, 55
 Weaning, 46
 Well-being, 78, 83, 91





